

63, 1935

27 OF 1935

In the Privy Council.

No. of 1935.

**ON APPEAL FROM THE SUPREME COURT OF
ALBERTA (APPELLATE DIVISION)**

Between

NORTHWESTERN UTILITIES, LIMITED

(Defendant) Appellant

and

LONDON GUARANTEE AND ACCIDENT COMPANY, LIMITED
AND OTHERS

(Plaintiffs) Respondents

RECORD OF PROCEEDINGS

VOLUME I.

Page 1 to Page 450

INDEX TO PART I.

No.	Description of Document	Date	Page
IN THE SUPREME COURT OF ALBERTA			
1	Amended Statement of Claim - - - -	19th August, 1932	3
2	Statement of Defence - - - - -	4th October, 1932	30
3	Order Reserving Matter of Damages - - - -	10th November, 1933	64
4	Opening of proceedings at trial - - - - -	15th January, 1934	65
5	Application for Amendment to Statement of Claim - - - - -	15th January, 1934	70
6	Admission of Facts by Defendant - - - - -	15th January, 1934	73
7	Extracts from Examination for Discovery of Julian Garrett, manager of the Defendant -	15th January, 1934	75
<i>Plaintiffs' Evidence.</i>			
8	James J. Christie - - - - -	15th January, 1934	114
9	Ruling by Trial Judge upon admissibility of certain questions and answers on Examination for Discovery of Julian Garrett relating to other fires and explosions - - - - -	16th January, 1934	124
10	Herbert Mayo - - - - -	16th January, 1934	124
11	J. Walter S. Chappelle - - - - -	16th January, 1934	127
12	Charles Albert Hebb - - - - -	16th January, 1934	131

RECORD OF PROCEEDINGS.

No.	Description of Document.	Date	Page
13	Harold Edward Gilbert Hotham Schofield - -	16th January, 1934 -	133
14	George Williamson - - - - -	16th January, 1934 -	135
15	Robert Semple - - - - -	16th January, 1934 -	152
16	George Constable - - - - -	16th January, 1934 -	160
17	Baden Powell Hobbs - - - - -	16th January, 1934 -	164
18	Alfred Hargrove - - - - -	16th January, 1934 - 17th January, 1934 -	170
19	Warner C. Browning - - - - -	17th January, 1934 -	196
20	Archie Campbell - - - - -	17th January, 1934 -	204
21	William Blair Airth - - - - -	17th January, 1934 -	207
22	Jasper Lockie - - - - -	17th January, 1934 -	208
23	Colin Douglas Mackenzie - - - - -	17th January, 1934 -	211
24	Alexander Annon Mackenzie - - - - -	17th January, 1934 -	223
25	Ranald D. White - - - - -	17th January, 1934 -	223
26	Robert Templeman - - - - -	17th January, 1934 - 18th January, 1934 -	225
27	Thomas Templeman - - - - -	18th January, 1934 -	238
28	John Booth - - - - -	18th January, 1934 -	245
29	Albert Dutton - - - - -	18th January, 1934 -	262
30	John McGaffin - - - - -	18th January, 1934 -	279
31	William Ruff - - - - -	18th January, 1934 - 19th January, 1934 -	282
32	Samuel Graham Francis - - - - -	19th January, 1934 -	303
33	Ernest John Atherton - - - - -	19th January, 1934 -	304
34	George William Underwood - - - - -	19th January, 1934 -	305
35	Albert Walter Haddow - - - - -	19th January, 1934 -	314
36	William Ruff (recalled) - - - - -	19th January, 1934 -	341
37	Albert Walter Haddow (recalled) - - - - -	19th January, 1934 -	342
38	Further extracts from Examination for Discovery of Julian Garrett, manager of the Defendant	22nd January, 1934 -	342
39	Albert Walter Haddow (recalled) - - - - -	22nd January, 1934 - 23rd January, 1934 -	343
40	William Barnhouse - - - - -	23rd January, 1934 -	417
41	Further extracts from Examination for Discovery of Julian Garrett, manager of the Defendant	23rd January, 1934 -	420
42	James Kidd - - - - -	23rd January, 1934 -	423
43	Edward Herbert Boomer - - - - -	23rd January, 1934 - 24th January, 1934 -	435
44	Ibrahim F. Morrison - - - - -	24th January, 1934 - 25th January, 1934 - 26th January, 1934 -	477
<i>Defendant's Evidence.</i>			
45	John Farquhar - - - - -	26th January, 1934 -	541
46	Abraham Kohn - - - - -	26th January, 1934 -	545
47	Frank McArthy - - - - -	26th January, 1934 -	551
48	Edgar G. Hill - - - - -	26th January, 1934 -	558
49	Application by Plaintiffs to reopen their case - - - - -	29th January, 1934 -	575
50	Edgar G. Hill (recalled) - - - - -	29th January, 1934 -	581
51	Oscar Walter Schultze - - - - -	29th January, 1934 -	598
52	Edgar G. Hill (recalled) - - - - -	29th January, 1934 -	603
53	Oscar Walter Schultze (recalled) - - - - -	29th January, 1934 -	605
54	George Barner - - - - -	29th January, 1934 -	607
55	Eric Harold Ewertz - - - - -	29th January, 1934 - 30th January, 1934 -	610
56	Robert Starr Leigh Wilson - - - - -	30th January, 1934 -	649
57	Alan Emerson Cameron - - - - -	31st January, 1934 -	683
58	Robert Starr Leigh Wilson (recalled) - - - - -	31st January, 1934 -	723
59	John Alexander Buchanan - - - - -	1st February, 1934 -	730
60	Horatio Ray Milner - - - - -	1st February, 1934 -	743
61	Application for Amendment to Statement of Defence - - - - -	1st February, 1934 -	752

No.	Description of Document	Date	Page
<i>Plaintiffs' Evidence in Rebuttal</i>			
62	William Ruff (recalled) - - - - -	1st February, 1934 -	754
63	Albert Walter Haddow (recalled) - - - - -	1st February, 1934 -	766
64	Ibrahim F. Morrison (recalled) - - - - -	1st February, 1934 -	773

65	Formal Judgment - - - - -	27th February, 1934 -	778
66	Reasons for Judgment - - - - -	27th February, 1934 -	778

IN THE SUPREME COURT OF ALBERTA (APPELLATE DIVISION)			
67	Notice of Appeal - - - - -	8th May, 1934 - - -	787
68	Judgment as to contents of Appeal Book - - - - -	25th June, 1934 - - -	793
69	Formal Judgment - - - - -	6th December, 1934 -	795
70	Reasons for Judgment on Appeal		
	(a) Harvey, C.J.A. - - - - -	5th December, 1934 -	796
	(b) Clarke, J.A. - - - - -	5th December, 1934 -	801
	(c) McGillivray, J.A. - - - - -	5th December, 1934 -	801
	(d) Lunney, J.A. (dissenting) - - - - -	5th December, 1934 -	801
	(e) Mitchell, J.A. (dissenting) - - - - -	6th December, 1934 -	803
71	Formal Order granting leave to appeal to His Majesty in Council - - - - -	10th December, 1934 -	808
71a	Order granting final leave to appeal to His Majesty in Council - - - - -	8th April, 1935 -	808A
72	Notice of Application to exclude certain evidence and exhibits from the Record - - - - -	3rd January, 1935 -	809
73	Formal Order dismissing application to exclude certain evidence and exhibits from the Record -	14th January, 1935 -	811

INDEX TO PART II

Exhibit Mark	Description of Document	Date	Page
1	Admission of Facts by Defendant - - - -	8th November, 1933 -	812
2	A bundle of Insurance Policies made between the various Plaintiff Insurance Companies and the Insured Plaintiffs (not printed) - - - -	Various Dates - - -	893
3	A bundle of subrogation receipts in respect of the amounts paid by the various Plaintiff Insurance Companies to the Insured Plaintiffs (not printed) - - - -	Various Dates - - -	893
4	Sketch showing lay-out of basement of Corona Hotel (see book of plans) - - - -	6th January, 1934 -	893
5	Plan of ground floor of Corona Hotel (not printed)	10th January, 1934 -	894
6	Agreement between Northwestern Utilities Limited and Williams Brothers for construction of gas distribution system and specifications - -	22nd June, 1923 - -	831
7	Rough sketch drawn by Julian Garrett, showing location of Gas Regulator Stations and the Intermediate Pressure line of Northwestern Utilities Limited, on the lane immediately south of Jasper Avenue (not printed) - - - -	20th January, 1933 -	895
8	Letter from Julian Garrett, manager of the Defendant, addressed to "Our Customers" - -	9th December, 1932 -	870
9	Article entitled "The Odorization of Natural Gas" taken from the "Gas Age Record" - - - -	6th September, 1930	859
10	Blueprint showing underground utilities at intersection of 107th Street and lane (see book of plans) - - - -	25th February, 1932 -	893
11	Report by J. Wild regarding flashing intermediate lines - - - -	6th February, 1932 -	855
12	Report by J. Wild regarding flashing intermediate lines - - - -	22nd September, 1931	854
13	Memoranda regarding odorization of natural gas	7th October, 1931 - - 8th October, 1931 - - 13th October, 1931 -	868
14	Plan of ground floor of Corona Hotel, showing the relative location of the various rooms in the hotel and the premises of the Motor Car Supply Company, Limited, to the east of the hotel and the barber shop to the west of the hotel (not printed) - - - -	March, 1932 - - -	894
15	Rough pencil sketches showing the relative location of the various articles of merchandise stored on the premises of the Motor Car Supply Company, Limited, on the ground floor and in the basement (not printed) - - - -	15th January, 1934 -	894
16	Statement showing quantity of Opex distribution stock owned by Sherwin-Williams Company of Canada, Limited, on consignment to the Motor Car Supply Company, Limited, as of December 31st, 1931, and statement of sales of Opex distribution stock from January 1st, 1932, to February 22nd, 1932 (not printed) - - - -	January and February, 1932 - - -	894
17	Bound book of dimensions eleven inches by nine and two-thirds inches by one and two-thirds inches containing an inventory of the stock of the Motor Car Supply Company, Limited, as of January 31st, 1932 (not printed) - - - -	31st January, 1932 - -	894
18	Plan of lane and land adjoining Corona Hotel (see book of plans) - - - -	Undated - - - -	893
19	Photograph of garbage burner in the basement of Corona Hotel, taken after the fire (not printed) - - - -	Undated - - - -	895

Exhibit Mark	Description of Document	Date	Page
20	Photograph showing debris of the Corona Hotel after the fire (not printed) - - - -	25th February, 1932 -	895
21	Photograph of south basement wall of Corona Hotel after the fire, showing light conduit No. 7 (not printed) - - - -	Undated - - - -	895
22	Photograph of south basement wall of Corona Hotel after the fire showing light conduit No. 8 (not printed) - - - -	Undated - - - -	895
23	Photograph of south basement wall of Corona Hotel after the fire where conduit enters (not printed) - - - -	25th February, 1932 -	895
24	Photograph of south basement wall of Corona Hotel, after the fire, showing door and conduits. (not printed) - - - -	25th February, 1932 -	895
25	Photograph of south basement wall of Corona Hotel, after the fire, showing conduits. (not printed) - - - -	Undated - - - -	896
26	Small poplar pole, 12 inches in length by 3 inches in diameter (separate exhibit) - - - -	Undated - - - -	898
27	Parcel containing eight irregular shaped stones, ranging from the smallest, one inch in diameter, to the largest, four inches by two and a half inches by two inches, taken from the trench after the intermediate pressure main was removed in June, 1932. (separate exhibit) - -	Undated - - - -	898
28	Plan showing location and elevations of utilities at intersection of 107th Street and lane (see book of plans) - - - -	13th August, 1932 - -	893
29	Four large sacks of back-filling material taken from the rear of the Corona Hotel (separate exhibit) - - - -	Undated - - - -	898
30	Wooden model prepared by the City Engineer to indicate the relative location and elevation of the various underground utilities at the intersection of 107th Street and the lane south of Jasper Avenue (separate exhibit) - - - -	Undated - - - -	900
31	Rough sketch showing location of three cables in wooden conduit box - - - -	19th January, 1934 -	877
32	Photograph of demolished south wall of Corona Hotel after the fire, showing wooden conduit box - - - -	14th June, 1932 - -	878
33	Photograph of demolished south wall of Corona Hotel after the fire, showing wooden conduit box - - - -	14th June, 1932 - -	879
34	Smoke testing machine consisting of chambers to contain air and burner material and pump to expel smoke from machine (separate exhibit)	Undated - - - -	898
35	Photograph of gas service pipe entering south basement wall of Corona Hotel (not printed) -	Undated - - - -	896
36	Photograph showing relative position of gas service pipe entering south basement wall of Corona Hotel (not printed) - - - -	3rd May, 1932 - - -	896
37	Plan of construction of gas distribution system on lane south of Jasper Avenue (see book of plans) - - - -	2nd August, 1923 - -	893
38	Photograph of trench for laying of gas mains near Edmonton Post Office (not printed) - -	Undated - - - -	896
39	Wooden model of manhole "A" and weir chamber (separate exhibit) - - - -	Undated - - - -	900
40	Invoices from City of Edmonton to Defendant -	25th October, 1923 - 24th November, 1923 - 26th November, 1923 -	852

Exhibit Mark	Description of Document	Date	Page
41	Plan showing location of underground utilities at intersection of 107th Street and lane (see book of plans) - - - - -	28th July, 1932 - - -	893
42	Two sections each of about three and a half inches in length of the twelve-inch intermediate pressure main, taken from each side of the portion of the welded joint at the centre of the intersection of 107th Street and the lane south of Jasper Avenue, which broke (separate exhibit)	Undated - - - - -	898
43	Section of the upper part of the twelve-inch intermediate pressure main about two feet in length including that part of the weld at the centre of 107th Street and the lane south of Jasper Avenue, which did not break (separate exhibit) - - - - -	Undated - - - - -	899
44	Photograph of end view of section of broken weld	Undated - - - - -	885
45	Micro-photograph of the weld west of broken weld - - - - -	Undated - - - - -	882
46	Micro-photograph of the weld east of the broken weld - - - - -	Undated - - - - -	882
47	Photograph showing the electric light and power conduits entering basement of Corona Hotel (not printed) - - - - -	Undated - - - - -	896
48	Photograph showing part of south wall of Corona Hotel after the fire (not printed) - - - - -	Undated - - - - -	896
49	Photograph showing soot marks on bricks of south basement wall of Corona Hotel (not printed) - - - - -	Undated - - - - -	896
50	Photograph of barometrical chart for February, 1932 (not printed) - - - - -	February, 1932 - - -	896
51	Photograph of south wall of basement of Corona Hotel showing spawling of brick and burnt joists (not printed) - - - - -	26th March, 1932 - -	897
52	Photograph of south wall of Corona Hotel after debris had been removed (not printed) - - - - -	3rd May, 1932 - - -	897
53	Photograph of northern part of east wall of Corona Hotel after the fire (not printed) - - - - -	3rd May, 1932 - - -	897
54	Photograph of the south wall of the Corona Hotel after the fire showing coal chutes and air shaft	3rd May, 1932 - - -	880
55	Photograph of the south wall of the Corona Hotel, partly demolished, showing coal chutes and air shaft - - - - -	24th May, 1932 - - -	881
56	Plan showing hotel site and details of utilities located at intersection of 107th Street and lane south of Jasper Avenue (not printed) - - - - -	18th May, 1932 - - -	894
57	Plan of Corona Hotel basement (not printed) - - - - -	29th July, 1932 - - -	895
58	Photograph of south wall of basement of Corona Hotel after the fire, showing coal chute (not printed) - - - - -	3rd May, 1932 - - -	897
59	Photograph of part of west wall of Corona Hotel after the fire (not printed) - - - - -	3rd May, 1932 - - -	897
60	Photograph of south wall of Corona Hotel after the fire, taken from a distance (not printed) - - - - -	Undated - - - - -	897
61	Photograph looking down coal chute, showing walls (not printed) - - - - -	Undated - - - - -	897
62	Photograph looking down coal chute, showing walls (not printed) - - - - -	Undated - - - - -	897
63	Photograph of south wall of Corona Hotel after the fire, showing coal chute (not printed) - - - - -	24th May, 1932 - - -	898
64	Photograph of south wall of Corona Hotel after the fire, to the west of view shown on Exhibit 63 (not printed) - - - - -	24th May, 1932 - - -	898

Exhibit Mark	Description of Document	Date	Page
65	Small portion of the actual weld to the east of the weld which broke (separate exhibit) - - -	Undated - - - - -	899
66	Actual pieces of weld to east of weld which broke (separate exhibit) - - - - -	Undated - - - - -	899
67	Actual pieces of weld to west of weld which broke (separate exhibit) - - - - -	Undated - - - - -	899
68	A small section of the twelve-inch intermediate pressure main containing a part of the centre weld at 107th Street and the lane south of Jasper Avenue, which did not break. This section was cut out from the section, Exhibit 43 (separate exhibit) - - - - -	Undated - - - - -	899
69	Illustration showing laying of gas pipe in a slough	Undated - - - - -	889
70	Illustration showing laying of gas pipe in a slough	Undated - - - - -	889
71	Rough sketch showing cross section of pavement and gas pipe at 107th Street - - - - -	25th January, 1934 -	890
72	Photograph of side view of broken weld, Exhibit 42 - - - - -	Undated - - - - -	884
73	Photograph of end view of broken weld, Exhibit 42 - - - - -	Undated - - - - -	886
74	Photograph showing sag in pavement at 107th St.	12th May, 1932 - - -	891
75	Photograph showing sag in pavement at 107th St.	12th May, 1932 - - -	891
76	Broken weld coupons (separate exhibit) - - -	Undated - - - - -	899
77	Sketch of end view of gas pipe - - - - -	29th January, 1934 -	887
78	Inspector's Daily Report - - - - -	17th August, 1923 - -	850
79	Inspector's Daily Report - - - - -	18th August, 1923 - -	851
80	Report of Barner re construction of weir chamber	Undated - - - - -	871
81	Sketch of welded joint showing lines of stress -	29th January, 1934 -	888
82	A model prepared by Mr. Ewertz consisting of a strip of rubber designed to represent a cross-section of a welded pipe joint to illustrate the stresses created in the joint by pulling and bending (separate exhibit) - - - - -	Undated - - - - -	900
83	Example of weld icicles (separate exhibit) - - -	Undated - - - - -	899
84	Photograph of section of weld (Exhibit 68) - - -	Undated - - - - -	883
85	Twelve fractured ends from the tested weld coupons taken from the welds to the east and west of the centre weld which broke (separate exhibit) - - - - -	Undated - - - - -	899
86	Wooden model prepared by Northwestern Utilities, Limited, showing the location and elevation of the underground utilities at the intersection of 107th Street and the lane south of Jasper Avenue (separate exhibit) - - - - -	Undated - - - - -	900
87	Sketch showing pavement and back-filling material over pipe - - - - -	31st January, 1934 -	890
88	Rough sketch showing bend in pipe - - - - -	1st February, 1934 -	892
89	Tile sewer pipe two feet six inches in length with a diameter of six inches (separate exhibit) -	Undated - - - - -	900
90	Notice by Defendant to Plaintiffs to admit and replies thereto - - - - -	8th November, 1933 23rd November, 1933 20th November, 1933 20th November, 1933 21st November, 1933 22nd November, 1933 20th November, 1933 23rd November, 1933 25th November, 1933 24th November, 1933 28th November, 1933 27th November, 1933	818

Exhibit Mark	Description of Document	Date	Page
91	Gas Application and Contract - - - - -	3rd January, 1924 -	856
92	Sections 24 to 42 inclusive of City of Edmonton	1930 - - - - -	873
92A	By-Law, Number 20 of 1930 - - - - -		
	Indenture made between the Northern Alberta		
	Natural Gas Development Company, Limited	29th May, 1923 - -	825
	and Northwestern Utilities Limited - - - - -		
93	Two letters from City Engineer to Plaintiffs'	3rd February, 1934 -	
	Solicitors - - - - -	8th February, 1934 -	872
	Blue print of Daily Progress Chart showing pro-	Undated - - - - -	873
	gress of construction of 1931 storm sewer (see		
	book of plans) - - - - -		

In the Privy Council.

No. of 1935.

**ON APPEAL FROM THE SUPREME COURT OF
ALBERTA (APPELLATE DIVISION)**

BETWEEN:

NORTHWESTERN UTILITIES LIMITED

(Defendant), Appellant.

AND

LONDON GUARANTEE & ACCIDENT COMPANY LIMITED;
THE UNITED ASSURANCE UNDERWRITERS; BRITISH COLONIAL
FIRE INSURANCE COMPANY; NORWICH UNION FIRE IN-
SURANCE SOCIETY LIMITED; BRITISH AMERICA ASSURANCE
COMPANY; INSURANCE COMPANY OF NORTH AMERICA;
CENTRAL INSURANCE COMPANY LIMITED; ALLIANCE IN-
SURANCE COMPANY OF PHILADELPHIA; LIVERPOOL & LON-
DON & GLOBE INSURANCE COMPANY LIMITED; SCOTTISH
UNION AND NATIONAL INSURANCE COMPANY; PRUDENTIAL
ASSURANCE COMPANY LIMITED; ROYAL INSURANCE COM-
PANY LIMITED; YORKSHIRE INSURANCE COMPANY LIMIT-
ED; UNIVERSAL INSURANCE COMPANY; WINNIPEG FIRE UN-
DERWRITERS AGENCY; LONDON & LANCASHIRE INSURANCE
COMPANY; FIRE INSURANCE COMPANY OF CANADA; AMERI-
CAN ALLIANCE INSURANCE COMPANY; GUARDIAN INSUR-
ANCE COMPANY OF CANADA; GLOBE UNDERWRITERS'
AGENCY; RELIANCE INSURANCE COMPANY; EMPLOYERS' LI-
ABILITY ASSURANCE CORPORATION LIMITED; THE MER-
CHANTS' MARINE INSURANCE COMPANY LIMITED; MERCAN-
TILE FIRE INSURANCE COMPANY; MILL OWNERS' MUTUAL
FIRE INSURANCE COMPANY; CONTINENTAL INSURANCE
COMPANY OF NEW YORK; UNITED STATES FIRE INSURANCE
COMPANY; SUN INSURANCE OFFICE LIMITED; AMERICAN IN-
SURANCE COMPANY (of Newark, N.J.); LOCAL GOVERNMENT
GUARANTEE SOCIETY LIMITED; SASKATCHEWAN FARMERS'
MUTUAL FIRE INSURANCE COMPANY; FIRE ASSOCIATION OF
PHILADELPHIA; QUEEN INSURANCE COMPANY; PROVIN-

CIAL INSURANCE COMPANY LIMITED; CANADIAN INDEMNITY COMPANY; GUARDIAN ASSURANCE COMPANY LIMITED OF LONDON, ENGLAND; RAILWAY PASSENGERS' ASSURANCE COMPANY; GENERAL INSURANCE COMPANY OF AMERICA; GLENS FALLS INSURANCE COMPANY; MERCHANTS' FIRE ASSURANCE CORPORATION OF NEW YORK; PACIFIC INSURANCE COMPANY; STANSTEAD INSURANCE COMPANY; LUMBERMEN'S INSURANCE COMPANY; STUYVESANT INSURANCE COMPANY; MILLERS NATIONAL INSURANCE COMPANY; WELLINGTON INSURANCE COMPANY; AETNA INSURANCE COMPANY; IMPERIAL ASSURANCE COMPANY; ROCHESTER UNDERWRITERS AGENCY; HALIFAX FIRE INSURANCE COMPANY; NORTH BRITISH & MERCANTILE INSURANCE COMPANY, LIMITED; FRANKLIN FIRE INSURANCE COMPANY; THE WESTMINSTER FIRE OFFICE; EAGLE STAR AND BRITISH DOMINIONS INSURANCE COMPANY LIMITED; SECURITY NATIONAL UNDERWRITERS; BRITISH TRADERS INSURANCE COMPANY LIMITED; PEARL ASSURANCE COMPANY LIMITED; NEW BRUNSWICK INSURANCE COMPANY; HUDSON BAY INSURANCE COMPANY; PACIFIC COAST FIRE INSURANCE COMPANY; ANGLO SCOTTISH INSURANCE COMPANY LIMITED; WESTCHESTER FIRE INSURANCE COMPANY; BEAVER FIRE INSURANCE COMPANY; CANADIAN FIRE INSURANCE COMPANY; PAIATINE INSURANCE COMPANY LIMITED; GREAT AMERICAN INSURANCE COMPANY; NATIONAL PROVINCIAL INSURANCE COMPANY LIMITED; CORONA HOTEL COMPANY LIMITED; MOTOR CAR SUPPLY COMPANY LIMITED; THORNTON PERKINS COMPANY; EMPIRE BUILDING COMPANY LIMITED; ISRAEL CLEMENT; JULIA PROKOS; MRS. LUCY HAWKINS; FLORENCE JANE TEETS; GEORGE R. F. KIRKPATRICK and MESSRS. McDOUGALL & SECORD LIMITED; W. H. ROWLAND and CARL WEIMAN; W. C. SMITH; MRS. M. A. FERGUSON; HON. LILLIAN ELPHINSTONE; ALFRED BROWN; JOHN JACOBS; CANADA PERMANENT TRUST COMPANY and H. T. EMERY, Executors of the Estate of E. C. Emery Deceased; E. E. KERSWELL; WILLIAM L. SINCLAIR; J. W. S. CHAPPELLE; T. SINTON; SHERWIN WILLIAMS COMPANY OF CANADA LIMITED; CREDIT FONCIER FRANCO-CANADIAN COMPANY; J. R. CARROLL and W. R. COUGHLIN (carrying on business as Coughlin and Carroll); FIRESTONE TIRE & RUBBER COMPANY OF CANADA LIMITED.

(Plaintiffs), Respondents.

RECORD OF PROCEEDINGS

PART I.

No. 1.

Amended Statement of Claim.

IN THE TRIAL DIVISION OF THE SUPREME COURT
OF ALBERTA

*In the
Supreme
Court of
Alberta,*

No. 1.
Amended
Statement
of Claim.
19th August,
1932.

1. All the plaintiffs named before the Corona Hotel Company Limited, are fire insurance companies carrying on business in the City of Edmonton, in the Province of Alberta and the defendant is a company carrying
10 on business in Edmonton and elsewhere in the said Province as suppliers of natural gas, of which business the defendant holds a franchise from the City of Edmonton.

2. The Corona Hotel Company Limited is a company which owned and operated the Corona Hotel on the south side of Jasper Avenue in Edmonton and during all times material to this action the said company carried insurance against loss and damage by fire, including loss or damage caused by the explosion of natural gas with the plaintiffs in paragraph 8 hereof mentioned.

3. The defendant has constructed and located along and under the
20 streets, lanes and various parts of the City of Edmonton, including the lane south of Jasper Avenue aforesaid between 106th and 107th Streets, pipes and mains to hold, keep and carry its gas and at all times material hereto operated the same for the said purpose.

4. On the 21st of February, 1932, the said Corona Hotel was destroyed by fire to the loss and damage of the Corona Hotel Company Limited.

5. The fire that destroyed the Corona Hotel was caused by the ignition of an inflammable mixture of natural gas and air in the basement of the said hotel. The natural gas in such mixture had escaped from the mains and pipes of the defendant situated in the lane in the rear of the
30 said hotel and running under and across 107th Street to the west thereof and had entered the said basement. Natural gas is a dangerous thing and the defendant is liable to the plaintiffs as hereinafter set out for the damage caused by its escape as aforesaid.

6. Alternatively, the escape of the said gas and the fire resulting therefrom was caused by the failure of the defendant to locate, construct and maintain its pipes and mains in the lane at the rear of the hotel and running under and across 107th Street as aforesaid so as not to endanger the public health and safety as required by the Water, Gas, Electric and Telephone Companies Act.

6. (a) Alternatively, the escape of the said gas constituted a nuisance which damaged the plaintiffs as herein set out.

7. In the further alternative the escape of the said gas and the fire resulting therefrom was caused by the negligence of the defendant, particulars of which are as follows:

(a) The defendant failed to so construct its pipes and mains and after construction, to keep the same so that gas would not escape therefrom.

(b) The defendant failed to have a system of inspection which would detect or discover leaks in the pipes or mains and in particular the leak complained of. 10

7. (1) In the further alternative the fire resulting from the escape of the said gas was caused by the negligence of the defendant in failing to mix with its gas an odorant or chemical by which a leak or an escape of gas could be readily discovered or detected.

(d) The defendant failed to instal or place its pipes or mains at a sufficient depth in the ground or below the frost line, so as to ensure that such pipes or mains would not break or get in disrepair so as to permit gas to escape. 20

(e) The defendant failed to repair and maintain its gas pipes properly, particularly the pipes crossing 107th St.

7. (a) Further alternatively the defendant failed so to construct its pipes and mains in the City of Edmonton and after construction failed to keep the same so that gas in dangerous quantities would not escape therefrom, and thereby maintained a public nuisance and by reason of the maintenance of such public nuisance the fire hereinbefore referred to occurred causing special damage to the plaintiffs.

8. The plaintiff Insurance Companies respectively in this paragraph mentioned, as required by their several policies of assurance held by the plaintiff Corona Hotel Company Limited have paid to the said Company the amounts following their respective names, for and in respect of the insured portion of the loss and damage caused to the said plaintiff Corona Hotel Company Limited by the said fire, namely: 30

London Guarantee & Accident Co. Ltd.	\$ 9,447.30	
The United Assurance Underwriters	1,889.45	
British Colonial Fire Insurance Company	11,107.20	
Norwich Union Fire Insurance Society Ltd.	4,892.25	
British America Assurance Company	8,209.80	
Insurance Company of North America	19,747.10	40
Central Insurance Company Limited	3,380.50	
Alliance Insurance Co. of Philadelphia	30,255.35	

Liverpool & London & Globe Insurance Co. Ltd.	24,848.10
Scottish Union and National Insurance Co. Ltd.	3,380.50
Prudential Assurance Company Limited	4,829.25
Royal Insurance Company Limited	4,829.25

*In the
Supreme
Court of
Alberta,*

—
No. 1.

**Amended
Statement
of Claim.**
19th August,
1932.
continued.

Such amounts being the amounts respectively at which the portion of the loss and damage caused to the said plaintiff Hotel Company by the said fire and insured against were properly adjusted by and between the said plaintiff Insurance Companies respectively and the said plaintiff Hotel Company.

10 9. The plaintiffs in the last preceding paragraph mentioned have respectively received from the Corona Hotel Company Limited assignments of all right of recovery against the defendant to the extent of the payments made by the said plaintiffs respectively, as in the last preceding paragraph set out, including the right of recovery of the said Hotel Company against the defendant to the extent of the said respective payments for and in respect of loss and damage caused to the said Hotel Company by the said fire and written notice of such assignments has been given to the defendant.

20 10. The plaintiffs respectively in paragraph 8 mentioned are subrogated to the extent of the payments respectively in paragraph 8 mentioned, to the right of recovery of the said Corona Hotel Company Limited against the defendant for and in respect of the loss and damage caused to the said Hotel Company by the said fire.

11. Motor Car Supply Company Limited is a company dealing in motor car supplies and prior to the fire in paragraph 4 referred to, carried on business in premises at 10621 Jasper Avenue, adjoining the Corona Hotel to the east.

30 12. The said fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively, in the manner in paragraphs 6, 6 (a), 7 and 7 (a) respectively, referred to, spread and escaped to the premises so occupied by Motor Car Supply Company Limited, to the loss and damage of the said Supply Company.

13. The plaintiffs respectively in this paragraph mentioned, as required by the several policies of assurance held by Motor Car Supply Company Limited, have paid to the said Company the amounts following their respective names, for and in respect of the loss and damage caused to the said Company by the said fire, namely:

	London & Lancashire Insurance Company	\$ 8,802.33
	Fire Insurance Company of Canada	7,783.46
40	American Alliance Insurance Company	7,412.80
	Guardian Insurance Company of Canada	6,968.00
	Globe Underwriters Agency	10,377.90
	Reliance Insurance Company	18,451.45

*In the
Supreme
Court of
Alberta,*

No. 1.
Amended
Statement
of Claim.
19th August,
1932.
continued.

Employers Liability Assurance Corporation Limited . . . 7,412.80
Such amounts being the amounts respectively at which the loss and damage caused to the said Supply Company by the said fire were properly adjusted by and between the said plaintiffs respectively and the said Supply Company.

14. The plaintiffs in the last preceding paragraph mentioned have respectively received from Motor Car Supply Company Limited assignments of all right of recovery against the defendant to the extent of the payments made by the said plaintiffs respectively as in the last preceding paragraph set out, including the right of recovery of the said Supply Company against the defendant to the extent of the said respective payments, for and in respect of loss and damage caused to the said Supply Company by the said fire, and written notice of such assignments has been given to the defendant. 10

15. The plaintiffs respectively in paragraph 13 mentioned are subrogated to the extent of the payments respectively in the said paragraph mentioned, to the right of recovery of the said Motor Car Supply Company Limited against the defendant for and in respect of the loss and damage caused to the said Supply Company by the said fire.

16. Thornton Perkins Company are a partnership carrying on business as upholsterers at 10628 Jasper Avenue, which premises are on the opposite side of Jasper Avenue from the Corona Hotel and in the vicinity thereof. 20

17. The said fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively, in the manner in paragraphs 6, 6(a), 7 and 7(a), respectively referred to, spread and escaped to the premises so occupied by Thornton Perkins Company, to the loss and damage of the said partnership.

18. The plaintiffs respectively in this paragraph mentioned as required by their several policies of assurance held by Thornton Perkins Company have paid to Thornton Perkins Company the amounts following their respective names for and in respect of loss or damage caused to Thornton Perkins Company by the said fire, namely: 30

Mercantile Fire Insurance Company	\$1,000.00
Mill Owners Mutual Fire Insurance Co.	2,155.50
Continental Insurance Co. of New York	2,000.00
United States Fire Insurance Company	1,500.00
Sun Insurance Office Limited	1,500.00

such amounts being the amounts respectively at which the loss and damage caused to the said Thornton Perkins Company by the said fire were properly adjusted by and between the said plaintiffs respectively and the said Thornton Perkins Company. 40

*In the
Supreme
Court of
Alberta,*
—
No. 1.
Amended
Statement
of Claim.
19th August,
1932.
continued.

19. The plaintiffs in the last preceding paragraph mentioned have respectively received from Thornton Perkins Company assignments of all right of recovery against the defendant to the extent of the payments made by the said plaintiffs respectively, as in the last preceding paragraph set out, including the right of recovery of the said Thornton Perkins Company against the defendant to the extent of said respective payments, for and in respect of loss and damage caused to the said Thornton Perkins Company by the said fire, and written notice of such assignments has been given to the defendant.

10 20. The plaintiffs respectively in paragraph 18 mentioned are subrogated to the extent of the payments respectively in the said paragraph mentioned to the right of recovery of the said Thornton Perkins Company against the defendant for and in respect of the loss and damage caused to the said Thornton Perkins Company by the said fire.

21. Empire Building Company Limited is the owner of Lot 129, Block 6, Plan "B" situated on the North side of Jasper Avenue between 106th and 107th Streets and opposite the Corona Hotel. There is erected thereon a three storey brick and steel building known as the Balmoral Block.

20 22. The said fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively in the manner in paragraphs 6, 6 (a), 7 and 7 (a) respectively referred to, spread and escaped to the premises so owned by Empire Building Company Limited to the loss and damage of the said Company.

23. The plaintiffs respectively in this paragraph mentioned, as required by their several policies of assurance held by Empire Building Company Limited have paid to the said Company the amounts following their respective names for and in respect of loss and damage caused to the said Company by the said fire, namely:

30	Universal Insurance Company	\$1,785.98
	Scottish Union and National Insurance Company	1,488.31
	Winnipeg Fire Underwriters Agency	1,488.31

such amounts being the amounts respectively at which loss and damage caused to the said Empire Building Company Limited by the said fire were properly adjusted by and between the said plaintiffs respectively and the said Empire Building Company Limited.

40 24. The plaintiffs in the last preceding paragraph mentioned have respectively received from Empire Building Company Limited assignments of all right of recovery against the defendant to the extent of the payments made by the said plaintiffs respectively as in the last preceding paragraph set out, including the right of recovery of the said Empire Building Company Limited against the defendant to the extent of the said

*In the
Supreme
Court of
Alberta,*

No. 1.
Amended
Statement
of Claim.
19th August,
1932.
continued.

respective payments for and in respect of loss and damage caused to the said Empire Building Company Limited by the said fire and written notice of such assignments has been given to the defendant.

25. The plaintiffs respectively in paragraph 23 mentioned are subrogated to the extent of the payments respectively in the said paragraph mentioned, to the right of recovery of the said Empire Building Company Limited against the defendant for and in respect of the loss and damage caused to the said Empire Building Company Limited by the said fire.

26. Israel Clement carries on business under the name of Beauchamp's Furrier, as a Furrier at 10624 Jasper Avenue, which premises are on the opposite side of Jasper Avenue from the Corona Hotel and in the vicinity thereof. 10

27. The said fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively in the manner in paragraphs 6, 6 (a), 7 and 7 (a) respectively referred to, spread and escaped to the premises so occupied by the said Israel Clement to his loss and damage.

28. The plaintiff Yorkshire Insurance Company Limited as required by its policy of assurance held by the said Israel Clement, has paid to him the sum of \$3,305.94 for and in respect of loss and damage caused to the said Clement by the said fire, such amount being the amount at which the loss and damage caused to the said Clement by the said fire was properly adjusted by and between the said Clement and the said plaintiff. 20

29. The said Yorkshire Insurance Company Limited has received from the said Israel Clement in the last preceding paragraph mentioned, an assignment of all right of recovery against the defendant to the extent of the said payment of \$3,305.94, including the right of recovery of the said Clement against the defendant to the said extent for and in respect of loss and damage caused to him by the said fire and written notice of such assignment has been given to the defendant.

30. The plaintiff Yorkshire Insurance Company Limited is subrogated to the extent of the said sum of \$3,305.94 to the right of recovery of the said Israel Clement against the defendant for and in respect of the loss and damage caused to the said Clement by the said fire. 30

31. Julia Prokos occupied premises in the Balmoral Block in paragraph 21 referred to.

32. The said fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively in the manner in paragraphs 6, 6 (a), 7 and 7 (a), referred to, spread and escaped to the premises so occupied by the said Julia Prokos to the loss and damage of the said Julia Prokos. 40

33. The plaintiff Saskatchewan Farmers Mutual Fire Insurance Company as required by its policy of assurance, held by the said Julia Prokos, paid to her the amount of \$40.00 in respect of loss and damage caused to her by the said fire, such amount being the amount at which the loss and damage caused to the said Julia Prokos by the said fire was properly adjusted by and between the said Julia Prokos and the said plaintiff.

*In the
Supreme
Court of
Alberta,*

—
No. 1.

Amended
Statement
of Claim.
19th August,
1932.

continued.

34. The plaintiff Saskatchewan Farmers Mutual Fire Insurance Company received from the said Julia Prokos an assignment of all her
10 right of recovery against the defendant to the extent of the said sum of \$40.00 including her right of recovery against the defendant to the said extent for and in respect of loss and damage caused to her by the said fire, and written notice of such assignment has been given to the defendant.

35. The plaintiff Saskatchewan Farmers Mutual Fire Insurance Company is subrogated to the extent of the said \$40.00 to the right of recovery of the said Julia Prokos against the defendant for and in respect of the loss and damage caused to her by the said fire.

36. Mrs. Lucy Hawkins occupied premises in the house immediately
20 to the west and adjoining the Corona Hotel.

37. The said fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively, in the manner in paragraphs 6, 6 (a), 7 and 7 (a) respectively referred to, spread and escaped to the said premises so occupied by the said Lucy Hawkins to her loss and damage.

38. The plaintiff Fire Association of Philadelphia as required by its policy of assurance held by the said Lucy Hawkins paid to her the amount of \$805.00 in respect of loss and damage caused to her by the said fire, such amount being the amount at which loss and damage caused to the said Lucy Hawkins by the said fire was properly adjusted by and be-
30 tween the said Lucy Hawkins and the said plaintiff.

39. The plaintiff Fire Association of Philadelphia received from the said Lucy Hawkins an assignment of all right of recovery against the defendant to the extent of the said sum of \$805.00, including the right of recovery of the said Lucy Hawkins against the defendant to the said extent, for and in respect of loss and damage caused to her by the said fire, and written notice of such assignment has been given to the defendant.

40. The plaintiff Fire Association of Philadelphia is subrogated to the extent of \$805.00 to the right of recovery of the said Lucy Hawkins against the defendant for and in respect of the loss and damage caused
40 to her by the said fire.

41. Florence Jane Teets occupied premises in the Balmoral Block, in paragraph 21 referred to.

*In the
Supreme
Court of
Alberta,*

No. 1.

Amended
Statement
of Claim.
19th August,
1932.
continued.

42. The said fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively, in the manner in paragraphs 6, 6 (a), 7 and 7 (a) referred to, spread and escaped to the premises so occupied by the said Florence Jane Teets, to her loss and damage.

43. The plaintiff Queen Insurance Company as required by its policy of assurance held by the said Florence Jane Teets, paid to her the amount of \$150.00 in respect of loss and damage caused to her by the said fire, such amount being the amount at which loss and damage caused to the said Florence Jane Teets by the said fire was properly adjusted by and between the said Florence Jane Teets and the said plaintiff. 10

44. The plaintiff Queen Insurance Company received from the said Florence Jane Teets an assignment of all right of recovery against the defendant, to the extent of the said sum of \$150.00 including the right of recovery of the said Florence Jane Teets against the defendant to the said extent, for and in respect of loss and damage caused to her by the said fire, and written notice of such assignment has been given to the defendant.

45. The plaintiff Queen Insurance Company is subrogated to the extent of \$150.00 to the right of recovery of the said Florence Jane Teets against the defendant for and in respect of loss and damage caused to her by the said fire. 20

46. George R. F. Kirkpatrick and Messrs. McDougall & Secord Limited own premises known as the Rex Cafe at 10613-10619 Jasper Avenue on the same side of Jasper Avenue as the Corona Hotel and in the vicinity thereof.

47. The said fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively in the manner in paragraphs 6, 6 (a), 7 and 7 (a) referred to, spread and escaped into the said Rex Cafe, to the loss and damage of the said Kirkpatrick and Messrs. McDougall and Secord Limited. 30

48. The plaintiffs respectively in this paragraph mentioned, as required by their said policies of assurance held by the said Kirkpatrick and McDougall and Secord Limited have paid to these parties the amounts following their respective names, for and in respect of loss and damage caused to them by the said fire in respect of the said Rex Cafe premises, namely:

Queen Insurance Company	\$875.19
London & Lancashire Insurance Co.	875.18

such amounts being the amounts respectively at which the loss and damage caused to the said Rex Cafe premises by the said fire were properly adjusted by and between the said plaintiffs respectively and the said Kirkpatrick and McDougall and Secord Limited. 40

49. The said Kirkpatrick and Messrs. McDougall & Secord Limited also owned a dwelling in the rear of 10613 Jasper Avenue, to which the said fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively, in the manner in paragraphs 6, 6 (a), 7 and 7 (a) referred to, spread and escaped to the said building, to the loss and damage of the said Messrs. Kirkpatrick and McDougall & Secord Limited.

50. The plaintiff London and Lancashire Insurance Company as required by its policy of insurance held by the said Kirkpatrick and McDougall & Secord Limited, paid to the said parties the amount of \$381.00 for and in respect of loss and damage caused to them by the said fire in respect of the said dwelling in paragraph 48 referred to such amount being the amount at which the loss and damage caused to them by the said fire in respect of the said dwelling in paragraph 48 referred to, was properly adjusted by and between the plaintiffs and the said Kirkpatrick and McDougall and Secord Limited.

51. The plaintiffs Queen Insurance Company and the London and Lancashire Insurance Company have respectively received from the said Kirkpatrick and McDougall and Secord Limited assignments of all right of recovery against the defendant to the extent of the payments made by the said plaintiffs respectively as in paragraphs 48 and 50 set out, including the right of recovery of the said Kirkpatrick, and McDougall and Secord Limited against the defendant to the extent of the said payments respectively, for and in respect of loss and damage caused to the said Kirkpatrick and McDougall and Secord Limited by the said fire and written notice of such assignment has been given to the defendant.

52. The plaintiffs Queen Insurance Company and London and Lancashire Insurance Company are subrogated to the extent of the payments respectively so made to said Kirkpatrick, and McDougall and Secord Limited, to the right of recovery of these parties against the defendant for and in respect of the loss and damage caused to them by the said fire.

53. W. H. Rowland and Carl Weiman carried on business as Furriers and occupied premises at 10613 Jasper Avenue, in the vicinity of the Corona Hotel and on the same side of Jasper Avenue.

54. The said fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively in the manner in paragraphs 6, 6 (a), 7 and 7 (a) referred to, spread and escaped to the premises so occupied by the said Rowland and Weiman to their loss and damage.

55. The plaintiff Provincial Insurance Company Limited as required by its policy of assurance held by the said Rowland and Weiman, paid to them the amount of \$252.40 in respect of loss and damage caused to them by the said fire, such amount being the amount at which loss and damage

*In the
Supreme
Court of
Alberta,*

—
No. 1.
Amended
Statement
of Claim.
19th August,
1932.
continued.

*In the
Supreme
Court of
Alberta,*

No. 1.
Amended
Statement
of Claim.
19th August,
1932.
continued.

caused to the said Rowland and Weiman by the said fire was properly adjusted by and between the said Rowland and Weiman and the said plaintiff.

56. The plaintiff Provincial Insurance Company Limited received from the said Rowland and Weiman assignments of all right of recovery against the defendant to the extent of the payment made by the said plaintiff, namely, \$252.40, including the right of recovery of the said Rowland and Weiman against the defendant to the said extent for and in respect of loss and damage caused to them by the said fire and written notice of such assignment has been given to the defendant. 10

57. The plaintiff Provincial Insurance Company Limited is subrogated to the extent of the said amount of \$252.40 to the right of recovery of the said Rowland and Weiman against the defendant for and in respect of loss and damage caused to the said Rowland and Weiman by the said fire.

58. W. C. Smith carried on business as a Furrier at the said premises 10613 Jasper Avenue, to which premises the said fire spread and escaped as in paragraph 54 mentioned.

59. The plaintiff Provincial Insurance Company Limited as required by its policy of assurance held by the said Smith, paid to him the sum of \$110.00 for and in respect of loss and damage caused to him by the said fire, such amount being the amount at which the loss and damage caused to the said W. C. Smith by the said fire was properly adjusted by and between the said Smith and the said plaintiff. 20

60. The said plaintiff Provincial Insurance Company Limited received from the said Smith an assignment of all right of recovery against the defendant to the extent of \$110.00, including the right of recovery of the said Smith against the defendant to the said extent, for and in respect of loss and damage caused to the said Smith by the said fire, and written notice of such assignment has been given to the defendant. 30

61. The plaintiff Provincial Insurance Company Limited is subrogated to the extent of \$110.00 to the right of recovery of the said Smith against the defendant for and in respect of loss and damage caused to him by the said fire.

62. Mrs. M. A. Ferguson carried on business as a Milliner at said premises, 10613 Jasper Avenue, to which premises the said fire spread and escaped as in paragraph 54 mentioned.

63. The plaintiff The Merchants Marine Insurance Company Limited, as required by its policy of insurance, held by the said M. A. Ferguson, paid to her the sum of \$119.70 for and in respect of loss caused to her by the said fire, such amount being the amount at which the loss and 40

damage caused to the said M. A. Ferguson by the said fire was properly adjusted by and between the said Ferguson and the said plaintiff.

*In the
Supreme
Court of
Alberta,*

—
No. 1.
Amended
Statement
of Claim.
19th August,
1932.
continued.

64. The said plaintiff The Merchants Marine Insurance Company Limited received from the said M. A. Ferguson an assignment of all right of recovery against the defendant to the extent of \$119.70, including the right of recovery of the said M. A. Ferguson against the defendant to the said extent for and in respect of loss and damage caused to her by the said fire, and written notice of such assignment has been given to the defendant.

10 65. The plaintiff The Merchants Marine Insurance Company Limited is subrogated to the extent of \$119.70 to the right of recovery of the said M. A. Ferguson against the defendant for and in respect of loss and damage caused to her by the said fire.

66. The Honourable Lillian Elphinstone owned the building at 10655 Jasper Avenue, in the vicinity of the Corona Hotel and on the same side of Jasper Avenue.

20 67. The said fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively, in the manner in paragraphs 6, 6 (a), 7 and 7 (a) respectively referred to, spread and escaped to the premises so owned by the said Honourable Lillian Elphinstone, at 10655 Jasper Avenue to the loss and damage of the said Honourable Lillian Elphinstone.

68. The plaintiffs respectively in this paragraph mentioned, as required by their several policies of assurance held by the said Honourable Lillian Elphinstone in respect of the said building at 10655 Jasper Avenue, have paid to her the amounts following their respective names for and in respect of loss and damage caused to her in respect of the said building by the said fire, namely:

30	Canadian Indemnity Company	\$54.00
	Canadian Assurance Co. of London, England	23.10
	Prudential Assurance Co. Ltd.	13.90

such amounts being the amounts respectively at which the loss and damage caused to the Hon. Lillian Elphinstone in respect to the said building by the said fire were properly adjusted by and between the said plaintiffs respectively and the said Honourable Lillian Elphinstone.

40 69. The said Honourable Lillian Elphinstone also owned a building at 10633 Jasper Avenue, to which the said fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively in the manner in paragraphs 6, 6 (a), 7 and 7 (a) respectively referred to, spread and escaped to the premises so owned by the Honourable Lillian Elphinstone to the loss and damage of the said Hon. Lillian Elphinstone.

*In the
Supreme
Court of
Alberta,*

No. 1.
Amended
Statement
of Claim.
19th August,
1932.
continued.

70. The plaintiffs respectively in this paragraph mentioned, as required by their several policies of assurance held by the said Hon. Lillian Elphinstone in respect of the said building at 10633 Jasper Avenue have paid to her the amounts following their respective names for and in respect of loss and damage caused to her by the said fire in respect of the said building, namely:

National Provincial Insurance Company Ltd.	\$38.00
Railway Passengers Assurance Company	19.00

such amounts being the amounts respectively at which the loss and damage caused to the Hon. Lillian Elphinstone in respect of the said building by the said fire were properly adjusted by and between the said plaintiffs respectively and the said Hon. Lillian Elphinstone. 10

71. The said Hon. Lillian Elphinstone also owned a building at 10057 107th Street to which the said fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively in the manner in paragraphs 5, 6(a), 7 and 7(a) respectively referred to, spread and escaped to the loss and damage of the said Hon. Lillian Elphinstone.

72. The Railway Passengers Assurance Company, as required by its policy of assurance held by the said Hon. Lillian Elphinstone in respect of the said building at 10057-107th Street paid to her the amount of \$120.40 for and in respect of loss and damage caused to her in respect of the said building, such amount being the amount at which the loss and damage caused to the said Hon. Lillian Elphinstone in respect of the said building, by the said fire was properly adjusted by and between the said Hon. Lillian Elphinstone and the said plaintiff. 20

73. The plaintiffs in paragraphs 68-70 and 72 mentioned, have respectively received from the said Hon. Lillian Elphinstone assignments of all right of recovery against the defendant to the extent of the said respective payments for and in respect of loss and damage caused to her by the said fire, and written notice of such assignments has been given to the defendant. 30

74. The plaintiffs in paragraphs 68-70 and 72 mentioned, are subrogated to the extent of the payments respectively in the said paragraphs mentioned, to the right of recovery of the said Hon. Lillian Elphinstone for and in respect of the loss and damage caused to her by the said fire.

75. Alfred Brown occupied the building at 10135-107th Street in the vicinity of the Corona Hotel.

76. The said fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively in the manner in paragraphs 6, 6(a), 7 and 7(a) respectively referred to, spread and escaped to the premises so occupied by the said Alfred Brown, to his loss and damage. 40

77. The plaintiff British Colonial Fire Insurance Company Limited as required by its policy of assurance, held by the said Alfred Brown, paid to him the amount of \$52.00 for and in respect of loss and damage caused to him by the said fire, such amount being the amount at which the loss and damage caused to the said Brown by the said fire was properly adjusted by and between the said Brown and the said plaintiff.

78. The said plaintiff British Colonial Fire Insurance Company Limited received from the said Alfred Brown an assignment of all right of recovery against the defendant to the extent of the said \$52.00, including the right of recovery of the said Brown against the defendant to the said extent for and in respect of loss and damage caused to him by the said fire and written notice of such assignment has been given to the defendant.

79. The plaintiff British Colonial Fire Insurance Company is subrogated to the extent of the said sum of \$52.00 to the right of recovery of the said Alfred Brown against the defendant for and in respect of loss and damage caused to him by the said fire.

80. John Jacobs owned a stock of furs at 10557 Jasper Avenue in the vicinity of the Corona Hotel and on the same side of Jasper Avenue.

81. The said fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively in the manner in paragraphs 6, 6 (a), 7 and 7 (a) respectively referred to, spread and escaped to the premises so occupied by the said stock of furs owned by the said John Jacobs, to the loss and damage of the said Jacobs.

82. The plaintiffs respectively in this paragraph mentioned, as required by their said policies of assurance held by the said Jacobs have paid to him the amount following their respective names for and in respect of loss and damage caused to him by the said fire, namely:

	Canadian Indemnity Company	\$115.65
30	Guardian Assurance Company Ltd. of London, England...	115.65

such amounts being the amounts respectively at which the loss and damage caused to the said Jacobs by the said fire were properly adjusted by and between the said plaintiffs respectively and the said Jacobs.

83. The plaintiffs in the last preceding paragraph mentioned have respectively received from the said John Jacobs therein mentioned, assignments of all right of recovery against the defendant to the extent of the payments made by the said plaintiffs respectively, as in the last preceding paragraph set out, including the right of recovery of the said Jacobs against the defendant to the extent of the said respective payments for and in respect of loss and damage caused to the said Jacobs by the said fire and written notice of such assignments has been given to the defendant.

*In the
Supreme
Court of
Alberta,*

No. 1.

Amended
Statement
of Claim.
19th August,
1932.
continued.

84. The plaintiffs respectively in paragraph 82 mentioned are subrogated to the extent of the payments respectively in the said paragraph mentioned, to the right of recovery of the said Jacobs against the defendant for and in respect of the loss and damage caused to the said Jacobs by the said fire.

85. Canada Permanent Trust Company and H. T. Emery, Executors of the Estate of E. C. Emery deceased, own a barn at 10044-106th Street in the vicinity of the Corona Hotel.

86. The said fire in paragraph 4 referred to caused in the manner in paragraph 5 referred to, or alternatively in the manner in paragraphs 6, 6 (a), 7 and 7 (a) respectively referred to, spread and escaped to the premises so owned by the said Canada Permanent Trust Company and H. T. Emery, Executors of the Estate of E. C. Emery deceased, to their loss and damage. 10

87. The plaintiff Royal Insurance Company Limited as required by its policy of assurance held by the said Canada Permanent Trust Company and H. T. Emery, Executors of the Estate of E. C. Emery deceased paid to them the amount of \$29.60 for and in respect of loss and damage caused to them by the said fire, such amount being the amount at which the loss and damage caused to the said Canada Permanent Trust Company and H. T. Emery, Executors of the Estate of E. C. Emery deceased, by the said fire was properly adjusted by and between the said Canada Permanent Trust Company and H. T. Emery, Executors of the Estate of E. C. Emery deceased, and the said plaintiff. 20

88. The plaintiff Royal Insurance Company Limited received from the Canada Permanent Trust Company and H. T. Emery, Executors of the Estate of E. C. Emery deceased, an assignment of all right of recovery against the defendant to the extent of \$29.60 including the right of recovery of the said Canada Permanent Trust Company and H. T. Emery, Executors of the Estate of E. C. Emery deceased, against the defendant to the said extent, for and in respect of loss and damage caused to the said Canada Permanent Trust Company and H. T. Emery, Executors of the Estate of E. C. Emery deceased, and written notice of such assignment has been given to the defendant. 30

89. The plaintiff Royal Insurance Company Limited is subrogated to the extent of \$29.60 to the right of recovery of the said Canada Permanent Trust Company and H. T. Emery, Executors of the Estate of E. C. Emery deceased, against the defendant for and in respect of loss and damage caused to the said Canada Permanent Trust Company and H. T. Emery, Executors of the Estate of E. C. Emery deceased, by the said fire. 40

90. Edwin Ernest Kerswell had certain household effects in the said

Balmoral Block in paragraph 21 hereof referred to, which were damaged by the said fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively, in the manner in paragraphs 6, 6(a), 7 and 7(a) respectively referred to, when the same spread and escaped to the Balmoral Block to the loss and damage of the said Kerswell.

*In the
Supreme
Court of
Alberta,*

No. 1.

Amended
Statement
of Claim.
19th August,
1932.
continued.

91. The plaintiff Winnipeg Fire Underwriters Agency as required by its policy of assurance held by the said Edwin Ernest Kerswell, paid to him the amount of \$240.00 for and in respect of loss and damage caused to him by the said fire, such amount being the amount at which the loss and damage caused to the said Kerswell by the said fire was properly adjusted by and between the said Kerswell and the said plaintiff.

92. The said plaintiff Winnipeg Fire Underwriters Agency received from the said Kerswell an assignment of all right of recovery against the defendant to the extent of \$240.00, including the right of recovery of the said Kerswell against the defendant to the said extent for and in respect of loss and damage caused to him by the said fire and written notice of such assignment has been given to the defendant.

93. The said plaintiff Winnipeg Fire Underwriters Agency is subrogated to the extent of the said sum of \$240.00 to the right of recovery of the said Kerswell against the defendant for and in respect of loss and damage caused to him by the said fire.

94. William Sinclair had certain household effects in the house immediately to the west of the Corona Hotel to which the fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively in the manner in paragraphs 6, 6(a), 7 and 7(a) respectively referred to, spread and escaped to the loss and damage of the said Sinclair.

95. The plaintiff Globe Underwriters Agency as required by its policy of assurance, held by the said Sinclair paid to him the amount of \$101.00 for and in respect of loss and damage caused to him by the said fire, such amount being the amount at which the loss and damage caused to the said Sinclair by the said fire was properly adjusted by and between the said Sinclair and the said plaintiff.

96. The said plaintiff Globe Underwriters Agency received from the said Sinclair an assignment of all right of recovery against the defendant to the extent of the said \$101.00 including the right of recovery of the said Sinclair against the defendant to the said extent for and in respect of loss and damage caused to the said Sinclair by the said fire and written notice of such assignment has been given to the defendant.

97. The plaintiff Globe Underwriters Agency is subrogated to the extent of \$101.00 to the right of recovery of the said Sinclair against the defendant for and in respect of loss and damage caused to the said Sinclair by the said fire.

*In the
Supreme
Court of
Alberta,*

No. 1.
Amended
Statement
of Claim.
19th August,
1932.
continued.

98. J. W. S. Chappelle was a guest at the Corona Hotel at the time of the fire and goods of his were damaged therein.

99. The plaintiff Provincial Insurance Company Limited as required by its policy of assurance held by the said Chappelle, paid to him the amount of \$300.00 for and in respect of loss and damage caused to him by the said fire, such amount being the amount at which loss and damage caused to the said Chappelle by the said fire was properly adjusted by and between the said Chappelle and the said plaintiff.

100. The said plaintiff Provincial Insurance Company Limited received from the said Chappelle an assignment of all right of recovery against the defendant to the extent of the said payment of \$300.00, including the right of recovery of the said Chappelle against the defendant to the said extent for and in respect of loss and damage caused to him by the said fire, and written notice of such assignment has been given to the defendant. 10

101. The plaintiff Provincial Insurance Company Limited is subrogated to the extent of \$300.00 to the right of recovery of the said Chappelle against the defendant for and in respect of loss and damage caused to the said Chappelle by the said fire.

102. T. Sinton had certain goods in the said Balmoral Block in paragraph 21 mentioned, which were damaged when the fire spread there- to as in paragraph 22 mentioned. 20

103. The plaintiff Glens Falls Insurance Company as required by its policy of assurance held by the said Sinton, paid to him the amount of \$25.00 for and in respect of loss and damage caused to him by the said fire, such amount being the amount at which loss and damage caused to the said Sinton by the said fire was properly adjusted by and between the said Sinton and the said plaintiff.

104. The said plaintiff Glens Falls Insurance Company received from the said Sinton an assignment of all right of recovery against the de- fendant to the extent of the said payment of \$25.00, including the right of recovery of the said Sinton against the defendant to the said extent for and in respect of loss and damage caused to him by the said fire and written notice of such assignment has been given to the defendant. 30

105. The plaintiff Glens Falls Insurance Company is subrogated to the extent of \$25.00 to the right of recovery of the said Sinton against the defendant for and in respect of the loss and damage caused to the said Sinton by the said fire.

106. Sherwin Williams Company of Canada Limited had certain goods stored in the Corona Hotel. 40

107. The said fire in paragraph 4 referred to, caused in the manner

in paragraph 5 referred to, or alternatively in the manner in paragraphs 6, 6(a), 7 and 7(a) referred to damaged the goods so stored by Sherwin Williams Company of Canada Limited to the loss and damage of the said Company.

*In the
Supreme
Court of
Alberta,*

No. 1.
Amended
Statement
of Claim.
19th August,
1932.
continued.

108. The plaintiffs respectively in this paragraph mentioned, as required by their several policies of assurance held by Sherwin Williams Company of Canada Limited, have paid to the said Company the amounts following their respective names for and in respect of the loss and damage caused to the said Company by the said fire, namely:

10	Aetna Insurance Company	\$100.80
	British Traders Insurance Co. Ltd.	67.20
	Pearl Assurance Company Limited	33.60
	Halifax Fire Insurance Company	33.60
	Insurance Company of North America	33.60
	Norwich Union Fire Insurance Society Ltd.	33.60
	New Brunswick Insurance Company	26.90
	North British & Mercantile Insurance Company Limited ..	26.90
	Eagle Star & British Dominion Insurance Co. Ltd.	26.90
	Westminster Fire Insurance Office	26.90
20	Imperial Assurance Company	20.15
	Security National Underwriters	20.15
	Hudson Bay Insurance Company	20.15
	Pacific Coast Fire Insurance Co.	13.45
	Queen Insurance Company	13.45
	Anglo-Scottish Insurance Co. Ltd.	13.45
	Liverpool & London & Globe Insurance Co. Ltd.	13.45
	Fire Association of Philadelphia	13.45
	Westchester Fire Insurance Co.	13.45
30	Beaver Fire Insurance Company	20.15
	Canadian Fire Insurance Company	13.45
	Rochester Underwriters Agency	13.45
	Franklin Fire Insurance Company	13.45
	Palatine Insurance Co. Ltd.	13.45
	Great American Insurance Company	13.45

such amounts being the amounts respectively at which the loss and damage caused to the said Company by the said fire were properly adjusted by and between the said plaintiffs respectively and the said Company.

40 109. The plaintiffs in the last preceding paragraph mentioned have respectively received from Sherwin Williams Company of Canada Limited assignments of all right of recovery against the defendant to the extent of the payments made by the said plaintiffs respectively as in the last preceding paragraph set out, including the right of recovery of the said Sherwin Williams Company of Canada Limited against the defendant to

*In the
Supreme
Court of
Alberta,*

No. 1.

Amended
Statement
of Claim.
19th August,
1932.
continued.

the extent of the said respective payments for and in respect of loss and damage caused to the said Sherwin Williams Company of Canada Limited by the said fire and written notice of such assignment has been given to the defendant.

110. The plaintiffs respectively in paragraph 108 mentioned, are subrogated to the extent of the payments respectively in the said paragraph mentioned, to the right of recovery of the said Sherwin Williams Company of Canada Limited against the defendant for and in respect of loss and damage caused to the said Company by the said fire.

111. Credit Foncier Franco-Canadienne Company own premises 10 immediately to the west of the said Corona Hotel.

112. The said fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively in the manner in paragraphs 6, 6(a), 7 and 7(a) referred to, spread and escaped to the said building, to the loss and damage of the said Credit Foncier Franco-Canadienne Company.

113. The plaintiffs respectively in this paragraph mentioned, as required by their respective policies of assurance held by Credit Foncier Franco-Canadienne Company have paid to the said Company the amounts following their respective names for and in respect of loss and damage 20 caused to the said Company by the said fire in respect of the said building, namely:

American Insurance Company (of Newark, N.J.)	\$1,075.65
Local Government Guarantee Society Ltd.	1,075.65

such amounts being the amounts respectively at which the loss and damage caused to the said Credit Foncier Franco-Canadienne Company in respect to the said building by the said fire was properly adjusted by and between the said plaintiffs respectively and the said Company.

114. The plaintiffs in the last preceding paragraph mentioned have respectively received from Credit Foncier Franco-Canadienne Company 30 assignments of all right of recovery against the defendant to the extent of the payments made by the said plaintiffs respectively as in the last preceding paragraph set out, including the right of recovery of the said Credit Foncier Franco-Canadienne Company against the defendant to the extent of the said respective payments for and in respect of loss and damage caused to the said Company by the said fire and written notice of such assignments has been given to the defendant.

115. The plaintiffs respectively in paragraph 113 mentioned, are subrogated to the extent of the payments respectively in the said paragraph mentioned, to the right of recovery of the said Credit Foncier Franco-Canadienne Company against the defendant for and in respect of loss and 40 damage caused to the said Company by the said fire.

116. Coughlin and Carroll carried on business as barbers in the Corona Hotel Barber Shop, on the Corona Hotel premises, at the time of the fire and goods of theirs were damaged therein.

117. The plaintiff British Colonial Fire Insurance Company as required by its policy of assurance held by the said Coughlin and Carroll paid to these parties the sum of \$1,500.00 for and in respect of loss and damage caused to them by the said fire, such amount being the amount at which loss and damage caused to the said Coughlin and Carroll by the said fire was properly adjusted by and between the said Coughlin and
10 Carroll and the said plaintiff.

118. The said plaintiff British Colonial Fire Insurance Company received from the said Coughlin and Carroll an assignment of all right of recovery against the defendant to the extent of the said payment of \$1,500.00, including the right of recovery of the said Coughlin and Carroll against the defendant to the said extent for and in respect of loss and damage caused to the said Coughlin and Carroll by the said fire and written notice of such assignment has been given to the defendant.

119. The plaintiff British Colonial Fire Insurance Company is subrogated to the extent of the said sum of \$1,500.00 to the right of recovery
20 of the said Coughlin and Carroll against the said defendant for and in respect of loss and damage caused to the said Coughlin and Carroll by the said fire.

120. The Firestone Tire & Rubber Company of Canada Limited had certain goods stored in the premises occupied by Motor Car Supply Company Limited as in paragraph 12 referred to, to which the said fire spread and escaped as therein mentioned, to the damage of the said Firestone Tire & Rubber Company of Canada Limited.

121. The plaintiffs respectively in this paragraph mentioned, as required by their respective policies of insurance held by Firestone Tire &
30 Rubber Company of Canada Limited have paid to the said Company the amounts following their respective names for and in respect of loss and damage caused to the said Company by the said fire, namely:

Merchants Fire Assurance Corporation of New York	\$2,189.73
Pacific Insurance Company	2,823.71
Stanstead and Sherbrooke Insurance Co.	1,862.93
Stuyvesant Insurance Company	2,328.71
Wellington Insurance Company	1,862.93
Miller's National Insurance Company	1,862.93
Lumbermen's Insurance Company	1,862.93

40 such amounts being the amounts respectively at which the loss and damage caused to the said Firestone Tire & Rubber Company of Canada Limited by the said fire was properly adjusted by and between the said plaintiffs and the said Company.

*In the
Supreme
Court of
Alberta,*

No. 1.
Amended
Statement
of Claim.
19th August,
1932.
continued.

122. The plaintiffs in the last preceding paragraph mentioned have respectively received from the Firestone Tire & Rubber Company of Canada Limited assignments of all right of recovery against the defendant to the extent of the payments made by the said plaintiffs respectively as in the last preceding paragraph set out, including the right of recovery of the said Firestone Tire & Rubber Company of Canada Limited against the defendant to the extent of the said respective payments for and in respect of loss and damage caused to the said Company by the said fire and written notice of such assignments has been given to the defendant.

10

123. The plaintiffs respectively in paragraph 121 mentioned, are subrogated to the extent of the payments respectively in the said paragraph mentioned, to the right of recovery of the said Firestone Tire & Rubber Company of Canada Limited against the defendant for and in respect of loss and damage caused to the said Company by the said fire.

124. McDougall & Secord Limited owned a dwelling which was damaged by the fire in paragraph 4 referred to, caused in the manner in paragraph 5 referred to, or alternatively in the manner in paragraphs 6, 6(a), 7 and 7(a) respectively referred to.

125. The plaintiffs London & Lancashire Insurance Company Limited as required by its policy of assurance held by the said McDougall & Secord Limited, has paid to it the sum of \$46.54 for and in respect of loss and damage caused to the said McDougall & Secord Limited by the said fire, such amount being the amount at which the loss and damage caused to the said McDougall & Secord Limited by the said fire was properly adjusted by and between the said McDougall & Secord Limited and the said plaintiff.

20

126. The said London & Lancashire Insurance Company Limited has received from the said McDougall & Secord Limited in the last preceding paragraph mentioned, an assignment of all right of recovery against the defendant to the extent of the said payment of \$46.54 including the right of recovery of the said McDougall & Secord Limited against the defendant to the said extent for and in respect of loss and damage caused to it by the said fire and written notice of such assignment has been given to the defendant.

30

127. The plaintiff London & Lancashire Insurance Company Limited is subrogated to the extent of the said \$46.54 to the right of recovery of the said McDougall & Secord Limited against the defendant for and in respect of the loss and damage caused to the said McDougall & Secord Limited by the said fire.

40

128. The plaintiffs J. R. Carroll and W. R. Coughlin (carrying on business as Coughlin and Carroll) sustained damage by reason of the said

fire in the sum of \$4,108.40, for the value of the goods and chattels destroyed by the said fire, particulars of which have already been furnished to the defendant. The said Coughlin and Carroll have received payment of insurance on the said goods and chattels destroyed, for the sum of \$1,500.00, as set forth in paragraphs 116-119 of the Statement of Claim and are entitled in their own right to receive from the defendant the sum of \$2,608.40, being the difference between the total loss and the amount received from the insurance companies.

*In the
Supreme
Court of
Alberta,*
—
No. 1.
Amended
Statement
of Claim.
19th August,
1932.
continued.

10 129. The plaintiff J. R. Carroll individually sustained loss and damage by reason of the said fire in the sum of \$86.50 for chattels belonging to him destroyed by the said fire, particulars of which have already been furnished to the defendant.

130. The plaintiffs Motor Car Supply Company Limited sustained damage by reason of the said fire in the sum of \$18,947.84 for the value of property destroyed by the said fire, and expenses necessitated by the said fire, particulars of which are as follows:

	2 Still Picture film projectors at \$25.00 each.....	\$ 50.00
	Electrical fixtures, bulbs, etc.	3.90
	1 Radio analyzer	30.00
20	9 Electric light fixtures at \$5.25 each	47.25
	Expenses of L. A. Cavanaugh, President, to Edmonton and return on two different occasions immediately fol- lowing the fire	80.00
	Expenses of R. R. Lynn with regard to stock immedi- ately following fire	25.05
	Expenses of A. A. MacKenzie with regard to stock, Cal- gary to Edmonton	22.50
	Telephone calls as result of fire	11.15
	Telegrams directly resulting from fire	5.60
30	Postage and bulletins used to make announcement of fire and new location—letterheads	16.87
	Postage	90.00
	Express, cartage and freight on merchandise shipped to Edmonton from Calgary, also prepaid charges on ship- ments sent by Calgary direct to customers in Edmonton territory during disestablishment after fire, estimated ...	76.00
	Express on shipments from factories which would ordin- arily have come freight, difference	130.00
40	Items of advertising—articles wanted, warehouse space wanted	13.50
	Installation of phones in new building	34.40
	Electric wiring in temporary quarters	151.53
	Outside signs on temporary quarters	95.00
	Hardware for new building—Munro Hardware	39.20

*In the
Supreme
Court of
Alberta,*

No. 1.
Amended
Statement
of Claim.
19th August,
1932.
continued.

Opening of safe by Mr. Fred Robertson, Edmonton . . .	19.00	
Digging out and delivery of safe from basement by Ed- monton Express & Transfer	30.15	
Cleaning work on new premises	6.00	
Electrical supplies for office from Northern Electric Company	21.18	
To armature for hot water heater from W. S. Jackson, Leduc	3.00	
Sheet iron for Mechanical Service Dept.	9.29	
Advertising in "Bulletin" and "Journal" as a result of fire	83.33	10
Value of Kardex Sales Analys s information being a com- plete record of the business of the Company in con- nection with its various customers since its inception	7,000.00	
Amount of labour necessary for the re-establishment of the Kardex Sales record	2,435.30	
Loss of actual business during period in which branch was closed, \$9,600, profit on which would amount to	2,112.00	
Loss of business occasioned by lack of full complete stock for a period of two weeks	1,980.00	20
Loss of business suffered by Calgary Branch owing to the fact that stock was depleted in trying to supply Ed- monton with its needs, approximately	500.00	
Salaries paid to Edmonton staff during time the branch was closed	703.00	
Temporary wooden shelving used in new building	598.64	
10 days rent in old location paid in advance and not re- ceived	75.00	
Informative value of correspondence with customers totally lost by fire	1,000.00	30
Advertising material, cuts, mats, booklets, folders, dis- play material, etc.	250.00	
Quotation and information file for Buying Dept.	500.00	
To loss of information and records in Credit file	700.00	
Total	\$18,947.84	

131. The plaintiff J. W. S. Chappelle sustained damage by reason of the said fire in the sum of \$4,037.45, for the value of goods and chattels destroyed by the said fire, particulars of which have already been furnished to the defendant. The said Chappelle has received payment of insurance on the said goods and chattels destroyed for the sum of \$300.00 as set forth in paragraph 99 of the Statement of Claim and is entitled in his own right to receive from the defendant the sum of \$3,737.45, being the difference between the total loss and the amount received from the insurance company. 40

132. The plaintiff Corona Hotel Company Limited at the time of the destruction of the said Corona Hotel as aforesaid was, and had for many years been operating the said Hotel at a large profit, the annual average net profit during the nine years preceding the said fire being \$17,959.85, and by reason of the said fire, caused in the manner in paragraph 5 referred to, or alternatively, in the manner in paragraphs 6, 6(a), 7 and 7(a) respectively referred to, lost the value of the said Hotel as a going concern and the rents and profits incident thereto, and has suffered loss and damage much in excess of the amount recovered from the several
 10 plaintiff Insurance Companies as mentioned in paragraph 8.

PARTICULARS:

	Value of property destroyed based on capitalization for twenty years of average annual net profits of preceding nine years:	
	Average profit per annum	\$17,959.85
	Deduct interest at 5% per annum on capital value of land \$40,000.00	2,000.00
		<hr/>
		\$15,959.85
20	Present value of an annuity of \$15,959.85 for twenty years at 5%: \$15,959.85 x 12.4622	198,894.84
	Less recovered from Insurance Companies	126,000.00
		<hr/>
		\$ 72,894.84
	Less basement, salvage, etc.	13,000.00
		<hr/>
		\$ 59,894.84

133. The plaintiff Lucy Hawkins carried on in premises injured by the said fire, the business of a boarding-house keeper. By reason of the said fire, the plaintiff Lucy Hawkins suffered serious damage in her business, particulars of which are as follows:

30	The boarding house was totally empty from February 21st, 1932 to May 1st, 1932. The average net profits of the business for such period are \$150.00 per month, making a total loss of	\$337.50
	The plaintiff was also compelled to pay rent to her landlord Credit Foncier Franco-Canadienne Co. for the same period during which the premises were uninhabitable at the rate of \$100.00 per month, making a further loss of	225.00
40	The plaintiff's rooming house was filled at the date of the fire; After the 1st of May, 1932, when the house was again ready for habitation the plaintiff suffered loss by reason of the difficulties of recovering her business to date, the sum of	270.00
		<hr/>
	Total damages	\$832.50

*In the
 Supreme
 Court of
 Alberta,*

No. 1.
 Amended
 Statement
 of Claim.
 19th August,
 1932.
continued.

In the
Supreme
Court of
Alberta,

No. 1.
Amended
Statement
of Claim.
19th August,
1932.
continued.

THE SEVERAL PLAINTIFFS THEREFORE CLAIM FROM THE
DEFENDANT DAMAGES IN THE AMOUNTS SET OPPOSITE
THEIR NAMES RESPECTIVELY:

(a)	London Guarantee & Accident Co. Ltd.	\$ 9,447.30	
(b)	The United Assurance Underwriters	1,889.45	
(c)	British Colonial Fire Insurance Co.—		
	1. Corona policy	\$11,107.20	
	2. Coughlin & Carroll	1,500.00	
	3. Alfred Brown	52.00	
		<hr/>	
		\$12,659.20	10
(d)	Norwich Union Fire Insurance Society Limited—		
	1. Corona policy	\$ 4,829.25	
	2. Sherwin Williams Co. of Canada Ltd. policy	33.60	
		<hr/>	
		\$ 4,862.85	
(e)	British America Assurance Co.	8,209.08	
(f)	Insurance Company of North America—		
	1. Corona policy	\$19,747.10	
	2. Sherwin Williams Co. of Canada Ltd. policy	33.60	20
		<hr/>	
		\$19,780.70	
(g)	Central Insurance Company Ltd.	3,380.50	
(h)	Alliance Insurance Co. of Philadelphia ..	30,255.35	
(i)	Liverpool & London & Globe Insurance Co. Ltd.—		
	1. Corona policy	\$24,848.10	
	2. Sherwin Williams Co., of Canada Lim- ited policy	13.45	
		<hr/>	
		\$24,861.55	30
(j)	Scottish Union and National Insurance Co.—		
	1. Corona policy	\$ 3,380.50	
	2. Empire Building Co. Ltd. policy	1,488.30	
		<hr/>	
		\$ 4,868.80	
(k)	Prudential Assurance Company Ltd.—		
	1. Corona policy	\$ 4,829.25	
	2. Hon. Lillian Elphinstone policy	13.90	
		<hr/>	
		\$ 4,843.15	

	(l) Royal Insurance Co. Ltd.—			
	1. Corona policy	\$ 4,829.25		
	2. Canada Permanent Trust Co. the Estate of E. C. Emery deceased, policy	29.60		
			\$ 4,858.85	
	(m) Yorkshire Insurance Co. Ltd.		3,305.94	
	(n) Universal Insurance Company		1,785.98	
	(o) Winnipeg Fire Underwriters Agency—			
	1. Empire Building Co. Ltd. policy	\$ 1,488.31		
10	2. Edwin E. Kerswell policy	240.85		
			\$ 1,728.31	
	(p) London & Lancashire Insurance Co.—			
	1. Motor Car Supply Co. Ltd. policy	8,802.33		
	2. Rex Cafe policy	875.19		
	3. 10613 Jasper Avenue policy	381.00		
	4. McDougall & Secord Ltd.	46.54		
			\$10,105.06	
	(q) Fire Insurance Company of Canada		7,783.46	
	(r) American Alliance Insurance Company ..		7,412.80	
20	(s) Guardian Insurance Company of Canada		6,968.00	
	(t) Globe Underwriters Agency—			
	1. Motor Car Supply Co. Ltd. policy	\$10,377.90		
	2. William Sinclair policy	101.00		
			\$10,478.90	
	(u) Reliance Insurance Company		18,451.45	
	(v) Employers Liability Assurance Corpora- tion Limited		7,412.80	
	(w) Mercantile Fire Insurance Company		1,000.00	
	(x) Mill Owners Mutual Fire Insurance Co. . .		2,155.50	
30	(y) Continental Insurance Co. of New York		2,000.00	
	(z) United States Fire Insurance Co.		1,500.00	
	(aa) Sun Insurance Office Limited		1,500.00	
	(bb) American Insurance Company (of New- ark, N.J.)		1,075.65	
	(cc) Local Government Guarantee Society Ltd.		1,075.65	
	(dd) Saskatchewan Farmers Mutual Fire In- surance Co.		40.00	
	(ee) Fire Association of Philadelphia—			
40	1. Lucy Hawkins policy	\$ 805.00		

*In the
Supreme
Court of
Alberta,*

No. 1.
Amended
Statement
of Claim.
19th August,
1932.
continued.

*In the
Supreme
Court of
Alberta,*

No. 1.
Amended
Statement
of Claim.
19th August,
1932.
continued.

	2. Sherwin Williams Co. of Canada Ltd. policy	13.45	
		<hr/>	\$ 818.45
(ff)	Queen Insurance Company—		
	1. Florence Jane Teets policy	\$ 150.00	
	2. Rex Cafe policy	875.19	
	3. Sherwin Williams Co. of Canada Ltd. policy	13.45	
		<hr/>	\$ 1,038.64
(gg)	Provincial Insurance Co. Ltd.—		10
	1. Rowland and Weiman policy	\$ 252.40	
	2. W. C. Smith policy	110.00	
	3. J. W. Chappelle policy	300.00	
		<hr/>	\$ 662.40
(hh)	National-Provincial Insurance Co. Ltd. . . .		38.00
(ii)	The Merchants Marine Insurance Co. Ltd.		119.70
(jj)	Canadian Indemnity Company—		
	1. Hon. Lillian Elphinstone policy	\$ 54.00	
	2. John Jacobs policy	115.65	
		<hr/>	\$ 169.65
(kk)	Guardian Assurance Company Limited of London, England—		20
	1. John Jacobs policy	115.65	
	2. Hon. L. Elphinstone policy	23.10	
		<hr/>	\$ 138.75
(ll)	Railway Passengers Assurance Co.—		
	1. Hon. Lillian Elphinstone policy (10655 Jasper Avenue)	19.00	
	2. Hon. Lillian Elphinstone policy (10057-107 Street)	120.40	
		<hr/>	\$ 139.40
(nn)	Glen Falls Insurance Company	25.00	
(oo)	Merchants Fire Assurance Corporation of New York	2,189.70	
(pp)	Aetna Insurance Company	100.80	
(qq)	British Traders Insurance Co. Ltd.	67.20	
(rr)	Pearl Assurance Co. Ltd.	33.60	
(ss)	Halifax Fire Insurance Company	33.60	
(uu)	New Brunswick Insurance Company	26.90	

	(vv) North British & Mercantile Insurance Co. Ltd.	26.90	<i>In the Supreme Court of Alberta, — No. 1. Amended Statement of Claim. 19th August, 1932. continued.</i>
	(ww) Eagle Star & British Dominions Insurance Co. Ltd.	26.90	
	(xx) Westminster Fire Office	26.90	
	(yy) Imperial Assurance Company	20.15	
	(zz) Security National Underwriters	20.15	
	(aaa) Hudson Bay Insurance Company	20.15	
	(bbb) Pacific Coast Fire Insurance Co.	13.45	
	(ccc) Anglo-Scottish Insurance Co. Ltd.	13.45	
10	(ddd) Westchester Fire Insurance Co.	13.45	
	(eee) Beaver Fire Insurance Company	20.15	
	(fff) Canadian Fire Insurance Company	13.45	
	(ggg) Rochester Underwriters Agency	13.45	
	(hhh) Franklin Fire Insurance Company	13.45	
	(iii) Palatine Insurance Co., Ltd.	13.45	
	(jjj) Great American Insurance Company	13.45	
	(kkk) Pacific Insurance Company	2,823.71	
	(lll) Stanstead and Sherbrooke Insurance Co.	1,862.93	
	(mmm) Stuyvesant Insurance Company	2,328.71	
20	(nnn) Wellington Insurance Company	1,862.93	
	(ooo) Miller's National Insurance Company	1,862.93	
	(ppp) Lumbermen's Insurance Company	1,862.93	
	(qqq) Corona Hotel Company Limited in addition to loss paid by Insurance Companies	59,894.84	
	(rrr) Coughlin & Carroll in addition to loss paid by Insur- ance Companies	2,608.40	
	(sss) J. R. Carroll individually	86.50	
	(ttt) Motor Car Supply Company Limited in addition to loss paid by Insurance Companies	18,947.84	
30	(uuu) J. W. S. Chappelle in addition to loss paid by Insur- ance Companies	3,737.45	
	(vvv) Mrs. Lucy Hawkins in addition to loss paid by Insur- ance Companies	832.50	
	2. Costs.		

DATED at Edmonton, Alberta, this 19th day of August, A.D. 1932, and delivered by Woods, Field, Craig & Hyndman, 316 McLeod Building, Edmonton, Alberta, Solicitors for the plaintiffs herein whose address for service is in care of their said solicitors.

This Amended Statement of Claim issued out of the office of the Clerk of the Supreme Court of Alberta, Judicial District of Edmonton, the 23rd day of August, A.D. 1932.

(Sgd.) R. P. WALLACE.

No. 2

Statement of Defence.

1. The plaintiffs named in the style of cause before the Corona Hotel Company Limited are not fire insurance companies, nor are they entitled to nor do they carry on business in the Province of Alberta.

2. The Corona Hotel Comany Limited did not own or operate the Corona Hotel on the south side of Jasper Avenue in the City of Edmonton. The said company did not carry any insurance against loss or damage by fire, including loss or damages caused by the explosion of natural gas or at all. 10

3. In answer to paragraph (3) of the Statement of Claim it is admitted that the pipes and mains of the defendant, in which the company keeps and carries its gas, are located and operated along and under the streets, lanes and various parts of the City, including the lane south of Jasper Avenue between 106th and 107th Streets, but such pipes and mains were not constructed by the defendant.

4. The said Corona Hotel was not destroyed by fire to the loss and damage of the Corona Hotel Company Limited on the 21st day of February, 1932, or at any time.

5. The fire which destroyed the Corona Hotel was not caused by the ignition of an inflammable mixture of natural gas and air in the basement of the said hotel. Natural gas had not escaped from the mains and pipes of the defendant situated in the lane in the rear of the said hotel, and running under and across 107th Street to the west thereof, and natural gas had not entered the basement of the said hotel. Natural gas is not a dangerous thing. 20

6. The defendant did not fail to but in fact did locate, construct and maintain its pipes and mains in the lane at the rear of the Corona Hotel and running under and across 107th Street so as not to endanger the public health and safety. The Water, Gas, Electric and Telephone Companies Act has no application to the matters in issue. No gas escaped from the said pipe and mains, nor did any fire result. 30

7. If an escape of gas occurred, (which is denied) the escape did not constitute a nuisance or damage the plaintiffs, or any of them.

8. There was no escape of gas, nor was the defendant negligent in any of the particulars alleged in paragraph 7 of the Statement of Claim.

- (a) The defendant did not fail to construct its pipes and mains nor after construction to keep the same so that gas would not escape therefrom;

- (b) The defendant did not fail to have a system of inspection which would detect or discover leaks in the pipes or mains, and in particular the leak alleged;
- (c) The defendant did not fail to instal or place its pipes at a sufficient depth in the ground or below the frost line, so as to ensure that such pipe or mains would not break or get in disrepair so as to permit gas to escape;
- (d) The defendant did not fail to repair and maintain its gas pipes properly, and in particular the pipes crossing
10 107th Street.

*In the
Supreme
Court of
Alberta,*

*No. 2.
Statement
of Defence
October,
1932.
continued.*

9. The defendant did not fail to mix with the gas an odorant or chemical by which a leak or an escape of gas could be readily discovered or detected.

10. In the alternative, the plaintiffs respectively, other than the Insurance Companies, were users of natural gas distributed by the defendant and were well aware that no odorant or chemical was mixed therewith, and are precluded from raising the contention alleged in paragraph 7(1) of the Statement of Claim.

20 11. In the further alternative, in answer to paragraph 7(1) of the Statement of Claim, the defendant says that the gas delivered was in its natural state and complied with the requirements of its franchise.

12. It is denied that the allegations contained in sub-paragraphs (a), (b) and (e) of paragraph 7 and paragraph 7(1) of the Statement of Claim constitute negligence on the part of the defendant.

13. If the defendant was negligent as alleged in paragraphs 7 and 7(1) of the Statement of Claim (which is denied) such negligence was not the cause of an escape of gas from its pipe or mains, nor the cause of the fire, as alleged in the Statement of Claim.

30 14. If natural gas did escape from the pipes or mains of the defendant as alleged in paragraphs 5, 6, 6(a), 7 and 7(a) of the Statement of Claim (which is denied) the said gas did not cause the fire that destroyed the Corona Hotel as alleged in the Statement of Claim.

15. The defendant did not fail so to construct its pipes and mains in the City of Edmonton or after construction to keep the same so that gas in dangerous quantities would not escape therefrom. The defendant did not maintain a public nuisance or, if it did (which is denied) such public nuisance was not the reason for the occurrence of the fire referred to in the Statement of Claim nor did such public nuisance cause any special damage to the plaintiffs or any of them.

16. In the alternative and further answer to the Statement of Claim the defendant says that its franchise alleged by the plaintiffs is embodied in an agreement dated the 16th day of November, 1915, under which the defendant received a grant from the City of Edmonton of full power, right and liberty to put down, maintain and operate gas pipe lines along, through and under the streets, squares, highways, lanes, alleys, grounds, bridges, parks, thoroughfares and other public places within the City, and to distribute natural gas in the said City in its natural condition.

17. The said agreement was given statutory effect by Chapter 29 of the Statutes of Alberta, 1916. 10

18. The defendant in distributing natural gas as alleged by the plaintiff is the proprietor of a public utility and as such is subject to the jurisdiction and supervision of the Board of Public Utility Commissioners in accordance with the provisions of the Public Utilities Act, 1923.

19. The said Board may make such Orders regarding equipment, appliances, safety devices, extension of works or systems, reporting and other matters as are necessary for the safety or convenience of the public or for the proper carrying out of any contract, charter or franchise involving the use of public property or rights and must conduct all inquiries necessary for the obtaining of complete information as to the manner in which proprietors of public utilities comply with the law or as to any matter or thing within the jurisdiction of the Board. The said Board has power to require every proprietor of a public utility to comply with the laws of the Province of Alberta and any Municipal By-law affecting a public utility and to conform to the duties imposed thereby or by the provisions of its own charter or by any agreement with any Municipality or other proprietor, and to furnish safe, adequate and proper service and to keep and maintain its property and equipment in such condition as to enable it to do so. 20

20. The defendant may be required by the Board to extend its mains and pipes to serve any part of the City. 30

21. No complaint has been made to the said Board and the Board has made no Order requiring the defendant to construct, maintain or inspect its pipes and mains in any manner other than that established and followed by the defendant, and the plaintiffs are precluded from contending and this Court has no jurisdiction to declare that the mains and pipes of the defendant constitute a nuisance or were constructed or are maintained in contravention of Section 13 of The Water, Gas, Electric and Telephone Companies Act.

22. In exercise of the powers conferred by the said franchise agreement and subject to the jurisdiction of the said Board the defendant constructed and since has operated pipe lines for the transmission and distribution of natural gas within the City of Edmonton. 40

23. In the alternative the defendant's pipe line system, including the pipe lines described in the Statement of Claim are located in the streets, lanes and public places of the City of Edmonton and a plan thereof was submitted to and approved by the City of Edmonton during construction, and the said pipe lines were located and constructed subject to the supervision and approval of the City Engineer of the City of Edmonton in accordance with the said franchise agreement, and the plaintiffs are precluded from contending that they constitute a nuisance or contravene section 13 of The Water, Gas, Electric & Telephone Companies Act.

*In the
Supreme
Court of
Alberta*

*No. 2.
Statement
of Defence
October,
1932.
continued.*

10 24. In the further alternative the pipes and mains mentioned in the Statement of Claim are constructed, installed and placed in the ground by independent and competent contractors and in accordance with good engineering skill and practice and such contractors had entire control of the construction, installation and placing of the said pipes and mains in the ground.

25. The location, construction, operation and maintenance of the said pipe lines, and in particular the pipe lines described in the Statement of Claim, was an ordinary and natural user of the land in which the said pipes were located, constructed, operated and maintained.

20 26. The said pipe lines, including the pipe lines mentioned in the Statement of Claim were located, constructed, operated and maintained for the common benefit of persons residing or carrying on business in the City of Edmonton, including the plaintiffs, and with their assent.

27. In the further alternative, if an escape of gas occurred as alleged in the Statement of Claim (which is denied) the said escape of gas resulted from a break in the defendant's pipe or main resulting from subsidence of the ground supporting the said pipes which was caused by the acts of a person or persons over whom the defendant has no control.

30 28. In the further alternative, if an escape of gas occurred as alleged in the Statement of Claim (which is denied) the said escape of gas resulted from a break in the defendant's pipe or main which was caused by an explosion in the sewers of the City of Edmonton in the vicinity of the said pipe or main, and the said break did not occur until after the commencement of the fire alleged in the Statement of Claim, and the escape of gas caused by the said break did not cause or contribute to the said fire in any way, or to the damage (if any) suffered by the plaintiffs as alleged in the Statement of Claim.

40 29. In the alternative, if any gas entered the basement of the said hotel it was conveyed there without the knowledge, volition or control of the defendant through a wooden conduit box enclosing electric wires or conductors constructed and maintained by the City of Edmonton without

*In the
Supreme
Court of
Alberta,*

—
No. 2.
Statement
of Defence
October,
1932.

its consent or compensation and in dangerous proximity, namely, less than three feet, to the pipes and mains of the defendant.

30. In the alternative, and in further answer to the Statement of Claim, if an escape of gas occurred from the defendant's pipes or mains as alleged in the Statement of Claim (which is denied) the said escape of gas was not the cause of fire alleged in the Statement of Claim, but the said fire was caused by the acts of a person or persons unknown to the defendant over whom the defendant had no control.

31. In the further alternative, if an escape of gas occurred from the defendant's pipes or mains as alleged in the Statement of Claim (which is denied) the said escape of gas was not the cause of the fire alleged in the Statement of Claim, but the said fire was caused by the negligence of a servant of the plaintiff Corona Hotel Company Limited in lighting a match with knowledge of the presence of gas. 10

32. In the further alternative, if a fire occurred in the said Corona Hotel, it was caused by the combustion of inflammable materials stored in the basement of the said hotel beneath the premises of the Motor Car Supply Company, Limited, contrary to the provisions of the by-laws of the City of Edmonton.

33. In the further alternative, if a fire occurred in the said Corona Hotel, the fire which caused the damage to the plaintiff (if any) was caused by the negligence of persons over whom the defendant had no control, in allowing fire to spread to the inflammable materials stored in the basement of the said hotel beneath the premises occupied by the Motor Car Supply Company, Limited, in failing to notice the spread of the fire to the said inflammable materials, and in failing to take adequate means to control the said fire after it had reached the said materials. 20

34. The plaintiff Corona Hotel Company Limited was a user of natural gas which was delivered to it by the defendant at the said plaintiff's property line and from there was conveyed to different parts of the Corona Hotel by the pipes of the said plaintiff. 30

35. If the Corona Hotel was destroyed by fire resulting from an escape of gas as alleged in the Statement of Claim (which is denied) the said gas escaped from a leak in the gas pipes in the said hotel and at the risk of the plaintiff Corona Hotel Company Limited.

36. The defendant has received no particulars of the damage alleged to have been suffered by those of the plaintiffs who allege that they were indemnified by the plaintiff Insurance Companies and consequently has no knowledge of the character or value of the property alleged to have been destroyed or damaged, as the case may be, and, by reason thereof, has been prejudiced and embarrassed in the settling of the terms of the Statement of Defence. 40

37. The claims against the defendant by the plaintiffs Corona Hotel Company Limited as contained in paragraph 132 of the Statement of Claim, and the Motor Car Supply Company Limited as contained in paragraph 130 of the Statement of Claim were commenced as a result of agreements between the said plaintiffs and the plaintiff Insurance Companies which agreements were made by way of maintenance or champerty and were and are illegal.

10 38. In the further alternative, if the plaintiffs suffered damage as alleged in the Statement of Claim (which is denied) as a result of an escape of gas from the defendant's pipes or mains (which is denied) such damage is too remote.

20 39. The plaintiff Corona Hotel Company Limited, did not hold policies of assurance with the plaintiff Insurance Companies mentioned in paragraph 8 of the Statement of Claim, or any of them. The said Insurance Companies were not, nor were any of them, required by their several policies of insurance to pay anything to the Corona Hotel Company Limited in respect of the insured portion of the loss and damage caused to the plaintiff by the said fire, nor have the said Insurance Companies nor any of them, paid to the plaintiff Corona Hotel Company Limited the amounts alleged in paragraph 8 of the Statement of Claim or any part thereof. The amounts of money set out in paragraph 8 of the Statement of Claim are not the amounts respectively at which the portion of the loss and damage caused to the plaintiff Hotel Company by the said fire, and insured against were properly adjusted by and between the said plaintiff Insurance Companies respectively and the said plaintiff Hotel Company. Alternatively the alleged adjustments made between the plaintiff Hotel Company and the plaintiff Insurance Companies were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

30 40. In the alternative, the allegation that the plaintiff Corona Hotel Company Limited and the Insurance Companies referred to in paragraph 8 of the Statement of Claim adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out and the defendant will so contend at or before the trial of this action.

40 41. The plaintiffs mentioned in paragraph 8 of the Statement of Claim have not, nor have any of them received from the Corona Hotel Company Limited assignments of all right of recovery against the defendant to the extent of the payments made by the said plaintiffs respectively, as set out in paragraph 8 of the Statement of Claim, nor did the assignments (if any) include the right of recovery of the said Hotel Company against the defendant to the extent of the said respective payments for and in

*In the
Supreme
Court of
Alberta,*

*No. 2.
Statement
of Defence
October,
1932.
continued.*

respect of loss or damage caused to the said Hotel Company by the said fire. Written notice of such assignments or any of them has not been given to the defendant.

42. The plaintiffs respectively mentioned in paragraph 8 of the Statement of Claim are not, nor are any of them, subrogated to the extent of the payments respectively alleged in paragraph 8 of the Statement of Claim, nor at all to the right of recovery of the Corona Hotel Company Limited against the defendant for and in respect of loss or damage caused to the said Hotel Company by the said fire.

43. The Motor Car Supply Company Limited did not prior to the fire, or at any time carry on business in premises at 10621 Jasper Avenue adjoining the Corona Hotel to the east. 10

44. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 and 7(a), of the Statement of Claim. The said fire did not spread and escape to the premises occupied by the Motor Car Supply Company Limited, nor did the said Motor Car Supply Company Limited suffer loss or damage thereby.

45. The Motor Car Supply Company Limited did not hold policies of insurance with the plaintiffs respectively mentioned in paragraph 13 of the Statement of Claim or any of them. The said plaintiffs were not, nor were any of them, required by their several policies of insurance to pay anything to the Motor Car Supply Company Limited in respect of the loss or damage caused to the said Company by the said fire, nor have the said plaintiffs nor any of them paid to the said Company the amounts alleged in paragraph 13 of the Statement of Claim or any part thereof. The amounts of money set out in paragraph 13 of the Statement of Claim are not the amounts respectively at which the loss or damage caused to the said Supply Company by the said fire were properly adjusted by and between the said plaintiffs respectively and the said Company. Alternatively the alleged adjustments made between the plaintiff Motor Car Supply Company Limited and the plaintiff Insurance Companies were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss. 20 30

46. In the alternative, the allegation that the plaintiff Motor Car Supply Company Limited and the Insurance Companies referred to in paragraph 13 of the Statement of Claim adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action. 40

47. The plaintiffs mentioned in paragraph 13 of the Statement of Claim have not, nor have any of them, received from the Motor Car Sup-

ply Company Limited assignments of all right of recovery against the defendant to the extent of the payments made by the said plaintiffs respectively, as set out in paragraph 13 of the Statement of Claim, nor did the assignments (if any) include the right of recovery of the said Motor Car Supply Company Limited against the defendant to the extent of the said respective payments for and in respect of loss or damage caused to the said Motor Car Supply Company Limited by the said fire. Written notice of such assignments or any of them has not been given to the defendant.

*In the
Supreme
Court of
Alberta*

*No. 2.
Statement
of Defence
October,
1932.
continued.*

10 48. The plaintiffs respectively mentioned in paragraph 13 of the Statement of Claim are not, nor are any of them subrogated to the extent of the payments respectively mentioned in paragraph 13 of the Statement of Claim, nor at all, to the right of recovery of the Motor Car Supply Company Limited against the defendant for and in respect of loss or damage caused to the said Supply Company by the said fire.

49. Thornton Perkins Company did not carry on business as upholsterers at 10628 Jasper Avenue on the opposite side of Jasper Avenue from the Corona Hotel, or in the vicinity thereof.

20 50. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a), of the Statement of Claim. The said fire did not spread and escape to the premises occupied by the Thornton Perkins Company, nor did the said Thornton Perkins Company suffer loss or damage thereby.

30 51. The Thornton Perkins Company did not hold policies of insurance with the plaintiffs respectively mentioned in paragraph 18 of the Statement of Claim or any of them. The said plaintiffs were not, nor were any of them required by their several policies of insurance to pay anything to the Thornton Perkins Company in respect of the loss or damage caused to the said Company by the said fire, nor have the said plaintiffs nor any of them paid to the said Company the amounts alleged in paragraph 18 of the Statement of Claim or any part thereof. The amounts of money set out in paragraph 18 of the Statement of Claim are not the amounts respectively at which the loss or damage caused to the said Thornton Perkins Company by the said fire were properly adjusted by and between the said plaintiffs respectively and the said Company. Alternatively the alleged adjustments made between the plaintiff Thornton Perkins Company and the plaintiff Insurance Companies were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

40 52. In the alternative, the allegation that the plaintiff Thornton Perkins Company and the Insurance Companies referred to in paragraph 18 of the Statement of Claim adjusted the alleged loss is frivolous, vexa-

*In the
Supreme
Court of
Alberta,*

No. 2.
Statement
of Defence
October,
1932.
continued.

tious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

53. The plaintiffs mentioned in paragraph 18 of the Statement of Claim have not, nor have any of them received from the Thornton Perkins Company assignments of all right of recovery against the defendant to the extent of the payments made by the said plaintiffs respectively, as set out in paragraph 18 of the Statement of Claim, nor did the assignments (if any) include the right of recovery of the said Thornton Perkins Company against the defendant to the extent of the said respective payments for and in respect of loss or damage caused to the said Company by the said fire. Written notice of such assignments or any of them has not been given to the defendant. 10

54. The plaintiffs respectively mentioned in paragraph 18 of the Statement of Claim are not, nor are any of them subrogated to the extent of the payments respectively mentioned in paragraph 18 of the Statement of Claim, nor at all to the right of recovery of the Thornton Perkins Company against the defendant for and in respect of loss or damage caused to the said Hotel Company by the said fire.

55. Empire Building Company Limited is not the owner of Lot 129, Block 6, Plan "B" situated on the north side of Jasper Avenue between 106th and 107th Streets and opposite the Corona Hotel, nor is there erected thereon a three storey brick and steel building known as the Balmoral Block. 20

56. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the premises owned by the Empire Building Company Limited, nor did the said Empire Building Company Limited suffer loss or damage thereby. 30

57. The Empire Building Company Limited did not hold policies of insurance with the plaintiffs respectively mentioned in paragraph 23 of the Statement of Claim or any of them. The said plaintiffs were not, nor were any of them, required by their several policies of insurance to pay anything to the Empire Building Company Limited in respect of the loss or damage caused to the said Company by the said fire, nor have the said plaintiffs nor any of them paid to the said Company the amounts alleged in paragraph 23 of the Statement of Claim or any part thereof. The amounts of money set out in paragraph 23 of the Statement of Claim are not the amounts respectively at which the loss or damage caused to the said Empire Building Company by the said fire were properly adjusted by and between the said plaintiffs respectively and the said Company. Alternatively the alleged adjustments made between the plaintiff Empire 40

Building Company Limited and the plaintiff Insurance Companies were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

*In the
Supreme
Court of
Alberta,*

58. In the alternative, the allegation that the plaintiff Empire Building Company Limited and the Insurance Companies referred to in paragraph 23 of the Statement of Claim adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

*No. 2.
Statement
of Defence
October,
1932.
continued.*

10 59. The plaintiffs mentioned in paragraph 23 of the Statement of Claim have not, nor have any of them, received from the Empire Building Company Limited assignments of all right of recovery against the defendant to the extent of the payments made by the said plaintiffs respectively, as set out in paragraph 23 of the Statement of Claim, nor did the assignments (if any) include the right of recovery of the said Building Company against the defendant to the extent of the said respective payments for and in respect of loss or damage caused to the said Building Company by the said fire. Written notice of such assignments or any of them has not been given to the defendant.

20 60. The plaintiffs respectively mentioned in paragraph 23 of the Statement of Claim are not, nor are any of them, subrogated to the extent of the payments respectively mentioned in paragraph 23 of the Statement of Claim, nor at all to the right of recovery of the Empire Building Company Limited against the defendant for and in respect of loss or damage caused to the said Building Company by the said fire.

61. Israel Clement does not carry on a business under the name of Beauchamp's Furrier, as a furrier at 10624 Jasper Avenue, nor are such premises on the opposite side of Jasper Avenue from the Corona Hotel or in the vicinity thereof.

30 62. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the premises occupied by Israel Clement, nor did the said Israel Clement suffer loss or damage thereby.

40 63. Israel Clement did not hold a policy of insurance with the plaintiff Yorkshire Insurance Company Limited. The said plaintiff was not required by its policy of insurance to pay anything to the said Israel Clement in respect of loss or damage caused to the said Israel Clement by the said fire, nor has the plaintiff paid to the said Israel Clement the amount alleged in paragraph 28 of the Statement of Claim or any part thereof. The amount of money set out in paragraph 28 of the Statement of Claim is not the amount at which the loss or damage caused to the

said Israel Clement by the said fire was properly adjusted by and between the said Israel Clement and the said plaintiff Yorkshire Insurance Company. Alternatively the alleged adjustments made between the plaintiff Israel Clement and the plaintiff Insurance Company were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

64. In the alternative, the allegation that the plaintiff Israel Clement and the Yorkshire Insurance Company adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action. 10

65. The plaintiff Yorkshire Insurance Company has not received from Israel Clement any assignment of all right of recovery against the defendant to the extent of the payment made by the said plaintiff, as set out in paragraph 28 of the Statement of Claim, nor did the assignment (if any) include the right of recovery of the said Israel Clement against the defendant to the extent of the said payment for and in respect of loss or damage caused to the said Israel Clement by the said fire. Written notice of such assignment has not been given to the defendant.

66. The plaintiff Yorkshire Insurance Company is not subrogated to the extent of the payment mentioned in paragraph 28 of the Statement of Claim, nor at all to the right of recovery of the said Israel Clement against the defendant for and in respect of loss or damage caused to the said Israel Clement by the said fire. 20

67. Julia Prokos did not occupy premises in the Balmoral Block, referred to in paragraph 21 of the Statement of Claim.

68. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the premises occupied by Julia Prokos nor did Julia Prokos suffer loss or damage thereby. 30

69. Julia Prokos did not hold a policy of insurance with the plaintiff Saskatchewan Farmers Mutual Fire Insurance Company. The said plaintiff was not required by its policy of insurance to pay anything to the said Julia Prokos in respect of loss or damage caused to the said Julia Prokos by the said fire, nor has the plaintiff paid to the said Julia Prokos the amount alleged in paragraph 33 of the Statement of Claim or any part thereof. The amount of money set out in paragraph 33 of the Statement of Claim is not the amount at which the loss or damage caused to the said Julia Prokos by the said fire was properly adjusted by and between the said Julia Prokos and the said plaintiff Saskatchewan Farmers Mutual Fire Insurance Company. Alternatively the alleged adjust- 40

ments made between the plaintiff Julia Prokos and the plaintiff Saskatchewan Farmers Mutual Fire Insurance Company were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

70. In the alternative, the allegation that the plaintiff Julia Prokos and the Saskatchewan Farmers Mutual Fire Insurance Company adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

10 71. The plaintiff Saskatchewan Farmers Mutual Fire Insurance Company has not received from Julia Prokos any assignment of all right of recovery against the defendant to the extent of the payment made by the said plaintiff, as set out in paragraph 33 of the Statement of Claim, nor did the assignment (if any) include the right of recovery of the said Julia Prokos against the defendant to the extent of the said payment for and in respect of loss or damage caused to the said Julia Prokos by the said fire. Written notice of such assignment has not been given to the defendant.

20 72. The plaintiff Saskatchewan Farmers Mutual Fire Insurance Company is not subrogated to the extent of the payment mentioned in paragraph 33 of the Statement of Claim, nor at all to the right of recovery of the said Julia Prokos against the defendant for and in respect of loss or damage caused to the said Julia Prokos by the said fire.

73. Mrs. Lucy Hawkins did not occupy premises in the house immediately to the West and adjoining the Corona Hotel.

30 74. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the premises occupied by Mrs. Lucy Hawkins nor did the said Mrs. Lucy Hawkins suffer loss or damage thereby.

40 75. Mrs. Lucy Hawkins did not hold a policy of insurance with the plaintiff Fire Association of Philadelphia. The said plaintiff was not required by its policy of insurance to pay anything to the said Mrs. Lucy Hawkins in respect of loss or damage caused to the said Mrs. Lucy Hawkins by the said fire, nor has the plaintiff paid to the said Mrs. Lucy Hawkins the amount alleged in paragraph 38 of the Statement of Claim or any part thereof. The amount of money set out in paragraph 38 of the Statement of Claim is not the amount at which the loss or damage caused to the said Mrs. Lucy Hawkins by the said fire was properly adjusted by and between the said Lucy Hawkins and the said plaintiff Fire Association of Philadelphia. Alternatively the alleged adjustments made between

*In the
Supreme
Court of
Alberta*

No. 2.
Statement
of Defence
October,
1932.
continued.

*In the
Supreme
Court of
Alberta,*

No. 2.
Statement
of Defence
October,
1932.
continued.

the plaintiff Mrs. Lucy Hawkins and the Fire Association of Philadelphia were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

76. In the alternative, the allegation that the plaintiff Mrs. Lucy Hawkins and Fire Association of Philadelphia adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

77. The plaintiff has not received from Mrs. Lucy Hawkins any assignment of all right of recovery against the defendant to the extent 10 of the payment made by the said plaintiff, as set out in paragraph 38 of the Statement of Claim, nor did the assignment (if any) include the right of recovery of the said Mrs. Lucy Hawkins against the defendant to the extent of the said payment for and in respect of loss or damage caused to the said Mrs. Lucy Hawkins by the said fire. Written notice of such assignment has not been given to the defendant.

78. The plaintiff Fire Association of Philadelphia is not subrogated to the extent of the payment mentioned in paragraph 38 of the Statement of Claim, nor at all to the right of recovery of the said Mrs. Lucy Hawkins against the defendant for and in respect of loss or damage caused to 20 the said Mrs. Hawkins by the said fire.

79. Florence Jane Teets did not occupy premises in the Balmoral Block referred to in paragraph 21 of the Statement of Claim.

80. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the premises occupied by Florence Jane Teets, nor did the said Florence Jane Teets suffer loss or damage thereby.

81. Florence Jane Teets did not hold a policy of insurance with the plaintiff Queen Insurance Company. The said plaintiff was not required 30 by its policy of insurance to pay anything to the said Florence Jane Teets in respect of loss or damage caused to the said Florence Jane Teets by the said fire, nor has the plaintiff paid to the said Florence Jane Teets the amount alleged in paragraph 43 of the Statement of Claim or any part thereof. The amount of money set out in paragraph 43 of the Statement of Claim is not the amount at which the loss or damage caused to the said Florence Jane Teets by the said fire was properly adjusted by and between the said Florence Jane Teets and the said plaintiff Queen Insurance Company. Alternatively the alleged adjustments made between the plaintiff Florence Jane Teets and the Queen Insurance Company were not 40 proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

82. In the alternative, the allegation that the plaintiff Florence Jane Teets and the Queen Insurance Company adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

83. The plaintiff Queen Insurance Company has not received from Florence Jane Teets any assignment of all right of recovery against the defendant to the extent of the payment by the said plaintiff, as set out in paragraph 43 of the Statement of Claim, nor did the assignment (if any) include the right of recovery of the said Florence Jane Teets against the defendant to the extent of the said payment for and in respect of loss or damage caused to the said Florence Jane Teets by the said fire. Written notice of such assignment has not been given to the defendant.

84. The plaintiff Queen Insurance Company is not subrogated to the extent of the payment mentioned in paragraph 43 of the Statement of Claim, nor at all to the right of recovery of the said Florence Jane Teets against the defendant for and in respect of loss or damage caused to the said Florence Jane Teets by the said fire.

85. George R. F. Kirkpatrick and Messrs. McDougall and Secord Limited do not own premises known as the Rex Cafe at 10613-10619 Jasper Avenue, on the same side of Jasper Avenue as the Corona Hotel and in the vicinity thereof.

86. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the premises occupied by the Rex Cafe, nor did the said Kirkpatrick and Messrs. McDougall and Secord Limited suffer loss or damage thereby.

87. George R. F. Kirkpatrick and Messrs. McDougall and Secord Limited did not hold policies of insurance with the plaintiffs respectively mentioned in paragraph 48 of the Statement of Claim, or any of them. The said plaintiffs were not, nor were any of them, required by their several policies of insurance to pay anything to George Kirkpatrick and Messrs. McDougall and Secord Limited in respect of the loss or damage caused to the said Company by the said fire, nor have the said plaintiffs, nor any of them, paid to the said Company the amounts alleged in paragraph 48 of the Statement of Claim or any part thereof. The amounts of money set out in paragraph 48 of the Statement of Claim are not the amounts respectively at which the loss or damage caused to the said Supply Company by the said fire were properly adjusted by and between the said plaintiffs respectively and the said Company. Alternatively the alleged adjustments made between the plaintiffs George R. F. Kirkpatrick and Messrs. McDougall and Secord Limited and the plaintiff Insurance Com-

*In the
Supreme
Court of
Alberta,*

—
No. 2.
Statement
of Defence
October,
1932.
continued.

panies were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

88. In the alternative the allegation that the plaintiffs George R. F. Kirkpatrick and Messrs. McDougall and Secord Limited and the Insurance Companies referred to in paragraph 48 of the Statement of Claim adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

89. The said George R. F. Kirkpatrick and Messrs. McDougall and Secord Limited did not own a dwelling in the rear of 10613 Jasper Ave. 10

90. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the said building mentioned in paragraph 49 of the Statement of Claim, nor did the said George R. F. Kirkpatrick and Messrs. McDougall and Secord Limited suffer loss or damage thereby.

91. George R. F. Kirkpatrick and Messrs. McDougall and Secord Limited did not hold a policy of insurance with the plaintiff London and Lancashire Insurance Company. The said plaintiff was not required by its policy of insurance to pay anything to the said George R. F. Kirkpatrick and Messrs. McDougall and Secord Limited in respect of loss or damage caused to the said George R. F. Kirkpatrick and Messrs. McDougall and Secord Limited by the said fire, nor has the plaintiff paid to the said Kirkpatrick and Messrs. McDougall and Secord Limited the amount alleged in paragraph 50 of the Statement of Claim or any part thereof. The amount of money set out in paragraph 50 of the Statement of Claim is not the amount at which the loss or damage caused to the said Kirkpatrick and Messrs. McDougall and Secord Limited by the said fire was properly adjusted by and between the said Kirkpatrick and Messrs. McDougall and Secord Limited and the said plaintiff London and Lancashire Insurance Company. Alternatively the alleged adjustments made between the said Kirkpatrick and Messrs. McDougall and Secord Limited and the plaintiff London and Lancashire Insurance Company were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss. 20 30

92. In the alternative, the allegation that the plaintiffs George R. F. Kirkpatrick and Messrs. McDougall and Secord Limited and the London and Lancashire Insurance Company adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action. 40

93. The plaintiffs mentioned in paragraphs 48 and 50 of the Statement of Claim have not, nor have any of them received from George R. F. Kirkpatrick and Messrs. McDougall and Secord Limited assignments of all right of recovery against the defendant to the extent of the payments made by the said plaintiffs respectively, as set out in paragraphs 48 and 50 of the Statement of Claim, nor did the assignments (if any) include the right of recovery of the said George Kirkpatrick and Messrs. McDougall and Secord Limited against the defendant to the extent of the said respective payments for and in respect of loss or damage caused to the said Companies by the said fire. Written notice of such assignments or any of them has not been given to the defendant.

94. The plaintiffs respectively mentioned in paragraphs 48 and 50 of the Statement of Claim are not, nor are any of them, subrogated to the extent of the payments respectively mentioned in paragraphs 48 and 50 of the Statement of Claim, nor at all to the right of recovery of the said George R. F. Kirkpatrick and Messrs. McDougall and Secord Limited against the defendant for and in respect of loss or damage caused to the said George R. F. Kirkpatrick and Messrs. McDougall and Secord Limited by the said fire.

95. W. H. Rowland and Carl Weiman did not carry on business as furriers nor did they occupy premises at 10613 Jasper Avenue in the vicinity of the Corona Hotel and on the same side of Jasper Avenue.

96. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the premises occupied by Messrs. Rowland and Weiman, nor did the said Messrs. Rowland and Weiman suffer loss or damage thereby.

97. Messrs. Rowland and Weiman did not hold policies of insurance with the plaintiff Provincial Insurance Company Limited. The said plaintiff was not required by its policy of insurance to pay anything to the said Messrs. Rowland and Weiman in respect of loss or damage caused to the said Messrs. Rowland and Weiman by the said fire, nor has the plaintiff paid to the said Messrs. Rowland and Weiman the amount alleged in paragraph 55 of the Statement of Claim or any part thereof. The amount of money set out in paragraph 55 of the Statement of Claim is not the amount at which the loss or damage caused to the said Messrs. Rowland and Weiman by the said fire was properly adjusted by and between the said Messrs. Rowland and Weiman and the said plaintiff Provincial Insurance Company Limited. Alternatively the alleged adjustments made between the plaintiffs Messrs. Rowland and Weiman and the Pro-

*In the
Supreme
Court of
Alberta,*

No. 2.
Statement
of Defence
October,
1932.
continued.

vincial Insurance Company Limited were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

98. In the alternative, the allegation that the plaintiffs Messrs. Rowland and Weiman and the Provincial Insurance Company Limited adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

99. The plaintiff Provincial Insurance Company Limited has not received from Messrs. Rowland and Weiman any assignment of all right 10 of recovery against the defendant to the extent of the payment made by the said plaintiff as set out in paragraph 55 of the Statement of Claim nor did the assignment (if any) include the right of recovery of the said Messrs. Rowland and Weiman against the defendant to the extent of the said payment for and in respect of loss or damage caused to the said Messrs. Rowland and Weiman by the said fire. Written notice of such assignment has not been given to the defendant.

100. The plaintiff Provincial Insurance Company Limited is not subrogated to the extent of the payment mentioned in paragraph 55 of the Statement of Claim, nor at all to the right of recovery of the said Rowland and Weiman against the defendant for and in respect of loss or 20 damage caused to the said Messrs. Rowland and Weiman by the said fire.

101. W. C. Smith did not carry on business as a furrier at 10613 Jasper Avenue.

102. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the premises occupied by W. C. Smith, nor did the said W. C. Smith suffer loss or damage thereby.

103. W. C. Smith did not hold a policy of insurance with the plain- 30 tiff Provincial Insurance Company Limited. The said plaintiff was not required by its policy of insurance to pay anything to the said W. C. Smith in respect of loss or damage caused to the said W. C. Smith by the said fire, nor has the plaintiff paid to the said W. C. Smith the amount alleged in paragraph 59 of the Statement of Claim or any part thereof. The amount of money set out in paragraph 59 of the Statement of Claim is not the amount at which the loss or damage caused to the said W. C. Smith by the said fire was properly adjusted by and between the said W. C. Smith and the said plaintiff Provincial Insurance Company Limited. Alternatively the alleged adjustments made 40

between the plaintiff W. C. Smith and the plaintiff Provincial Insurance Company Limited were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

*In the
Supreme
Court of
Alberta,*

104. In the alternative, the allegation that the plaintiff W. C. Smith and the Provincial Insurance Company Limited adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

*No. 2.
Statement
of Defence
October,
1932.
continued.*

105. The plaintiff Provincial Insurance Company Limited has not
10 received from W. C. Smith any assignment of all right of recovery against the defendant to the extent of the payment made by the said plaintiff as set out in paragraph 59 of the Statement of Claim, nor did the assignment (if any) include the right of recovery of the said W. C. Smith against the defendant to the extent of the said payment for and in respect of loss or damage caused to the said W. C. Smith by the said fire. Written notice of such assignment has not been given to the defendant.

106. The plaintiff Provincial Insurance Company Limited is not sub-rogated to the extent of the payment mentioned in paragraph 59 of the
20 Statement of Claim, nor at all to the right of recovery of the said W. C. Smith against the defendant for and in respect of loss or damage caused to the said W. C. Smith by the said fire.

107. Mrs. M. A. Ferguson does not carry on business as a milliner at 10613 Jasper Avenue.

108. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the premises occupied by Mrs. M. A. Ferguson nor did the said Mrs. M. A. Ferguson suffer loss or damage thereby.

109. Mrs. M. A. Ferguson did not hold a policy of insurance with
30 the plaintiff Merchants Marine Insurance Company Limited. The said plaintiff was not required by its policy of insurance to pay anything to the said Mrs. M. A. Ferguson in respect of loss or damage caused to the said Mrs. M. A. Ferguson by the said fire, nor has the plaintiff paid to the said Mrs. M. A. Ferguson the amount alleged in paragraph 63 of the Statement of Claim or any part thereof. The amount of money set out in paragraph 63 of the Statement of Claim is not the amount at which the loss or damage caused to the said Mrs. M. A. Ferguson by the said fire was properly adjusted by and between the said Mrs. M. A. Ferguson and the said plaintiff Merchants Marine Insurance Company Limited.
40 Alternatively the alleged adjustments made between the plaintiff Mrs. M. A. Ferguson and the Merchants Marine Insurance Company Limited were

not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

110. In the alternative, the allegation that the plaintiff Mrs. M. A. Ferguson and the Merchants Marine Insurance Company Limited adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

111. The plaintiff Merchants Marine Insurance Company Limited has not received from Mrs. M. A. Ferguson any assignment of all right of recovery against the defendant to the extent of the payment made by the said plaintiff as set out in paragraph 63 of the Statement of Claim, nor did the assignment (if any) include the right of recovery of the said Mrs. M. A. Ferguson against the defendant to the extent of the said payment for and in respect of loss or damage caused to the said Mrs. M. A. Ferguson by the said fire. Written notice of such assignment has not been given to the defendant. 10

112. The plaintiff Merchants Marine Insurance Company Limited is not subrogated to the extent of the payment mentioned in paragraph 63 of the Statement of Claim, nor at all to the right of recovery of the said Mrs. M. A. Ferguson against the defendant for and in respect of loss or damage caused to the said Mrs. M. A. Ferguson by the said fire. 20

113. The Honourable Lillian Elphinstone did not own the building at 10655 Jasper Avenue in the vicinity of the Corona Hotel and on the same side of Jasper Avenue.

114. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the premises owned by the Honourable Lillian Elphinstone at 10655 Jasper Avenue, nor did the Honourable Lillian Elphinstone suffer loss or damage thereby. 30

115. The Honourable Lillian Elphinstone did not hold policies of insurance with the plaintiffs respectively mentioned in paragraph 68 of the Statement of Claim, or any of them. The said plaintiffs were not, nor were any of them required by their several policies of insurance to pay anything to the Honourable Lillian Elphinstone in respect of the loss or damage caused to the said Honourable Lillian Elphinstone by the said fire, nor have the said plaintiffs nor any of them paid to the said Honourable Lillian Elphinstone the amounts alleged in paragraph 68 of the Statement of Claim or any part thereof. The amounts of money set out in paragraph 68 of the Statement of Claim are not the amounts respectively at which the loss or damage caused to the said Honourable Lillian Elphinstone by the said fire were properly adjusted by and be- 40

tween the said plaintiffs respectively and the said Honourable Lillian Elphinstone. Alternatively, the alleged adjustments made between the said plaintiff Honourable Lillian Elphinstone and the plaintiff Insurance Companies were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

116. In the alternative, the allegation that the plaintiff Honourable Lillian Elphinstone and the Insurance Companies referred to in paragraph 68 of the Statement of Claim adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

117. The said Honourable Lillian Elphinstone did not own a building at 10633 Jasper Avenue.

118. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the premises owned by the Honourable Lillian Elphinstone at 10633 Jasper Avenue, nor did the Honourable Lillian Elphinstone suffer loss or damage thereby.

119. The Honourable Lillian Elphinstone did not hold policies of insurance with the plaintiffs respectively mentioned in paragraph 70 of the Statement of Claim or any of them. The said plaintiffs were not, nor were any of them required by their several policies of insurance to pay anything to the Honourable Lillian Elphinstone in respect of the loss or damage caused to the said Honourable Lillian Elphinstone by the said fire, nor have the said plaintiffs nor any of them paid to the said Honourable Lillian Elphinstone the amounts alleged in paragraph 70 of the Statement of Claim or any part thereof. The amounts of money set out in paragraph 70 of the Statement of Claim are not the amounts respectively at which the loss or damage caused to the said Honourable Lillian Elphinstone by the said fire were properly adjusted by and between the said plaintiffs respectively and the said Honourable Lillian Elphinstone. Alternatively the alleged adjustments made between the plaintiff Honourable Lillian Elphinstone and the plaintiff Insurance Companies were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

120. In the alternative, the allegation that the plaintiff Honourable Lillian Elphinstone and the Insurance Companies referred to in paragraph 70 of the Statement of Claim adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

*In the
Supreme
Court of
Alberta*

No. 2.
Statement
of Defence
October,
1932.
continued.

*In the
Supreme
Court of
Alberta,*

—
No. 2.
Statement
of Defence
October,
1932.
continued.

121. The said Honourable Lillian Elphinstone did not own a building at 10057-107th Street.

122. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the premises owned by the Honourable Lillian Elphinstone at 10057-107th Street, nor did the Honourable Lillian Elphinstone suffer loss or damage thereby.

123. The Honourable Lillian Elphinstone did not hold a policy of insurance with the plaintiff Railway Passengers Assurance Company. The said plaintiff was not required by its policy of insurance to pay anything 10 to the said Honourable Lillian Elphinstone in respect of loss or damage caused to the said Honourable Lillian Elphinstone by the said fire, nor has the plaintiff paid to the said Honourable Lillian Elphinstone the amount alleged in paragraph 72 of the Statement of Claim or any part thereof. The amount of money set out in paragraph 72 of the Statement of Claim is not the amount at which the loss or damage caused to the said Honourable Lillian Elphinstone by the said fire was properly adjusted by and between the said Honourable Lillian Elphinstone and the said plaintiff Railway Passengers Assurance Company. Alternatively the 20 alleged adjustments made between the plaintiff Honourable Lillian Elphinstone and the plaintiff Railway Passengers Assurance Company were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

124. In the alternative, the allegation that the plaintiff Honourable Lillian Elphinstone and the Railway Passengers Assurance Company adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

125. The plaintiffs mentioned in paragraphs 68, 70 and 72 of the Statement of Claim have not, nor have any of them, received from the Honourable Lillian Elphinstone assignments of all right of recovery 30 against the defendant to the extent of the payments made by the said plaintiffs respectively, as set out in paragraphs 68, 70 and 72 of the Statement of Claim, nor did the assignments (if any) include the right of recovery of the said Honourable Lillian Elphinstone against the defendant to the extent of the said respective payments for and in respect of loss or damage caused to the said Honourable Lillian Elphinstone by the said fire. Written notice of such assignments or any of them has not been given to the defendant.

126. The plaintiffs respectively mentioned in paragraphs 68, 70 and 40 72 of the Statement of Claim are not, nor are any of them, subrogated

to the extent of the payments respectively mentioned in paragraphs 68, 70 and 72 of the Statement of Claim, nor at all to the right of recovery of the Honourable Lillian Elphinstone against the defendant for and in respect of loss or damage caused to the said Honourable Lillian Elphinstone by the said fire.

127. Alfred Brown did not occupy the building at 10135-107th Street in the vicinity of the Corona Hotel.

128. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the premises occupied by Alfred Brown, nor did the said Alfred Brown suffer loss or damage thereby.

129. Alfred Brown did not hold a policy of insurance with the plaintiff British Colonial Fire Insurance Company Limited. The said plaintiff was not required by its policy of insurance to pay anything to the said Alfred Brown in respect of loss or damage caused to the said Alfred Brown by the said fire, nor has the plaintiff paid to the said Alfred Brown the amount alleged in paragraph 77 of the Statement of Claim or any part thereof. The amount of money set out in paragraph 77 of the Statement of Claim is not the amount at which the loss or damage caused to the said Alfred Brown by the said fire was properly adjusted by and between the said Alfred Brown and the said plaintiff British Colonial Fire Insurance Company Limited. Alternatively the alleged adjustments made between the plaintiff Alfred Brown and the British Colonial Fire Insurance Company were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

130. In the alternative, the allegation that the plaintiff Alfred Brown and the British Colonial Fire Insurance Company adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

131. The plaintiff British Colonial Fire Insurance Company Limited has not received from Alfred Brown any assignment of all right of recovery against the defendant to the extent of the payment made by the said plaintiff as set out in paragraph 77 of the Statement of Claim, nor did the assignment (if any) include the right of recovery of the said Alfred Brown against the defendant to the extent of the said payment for and in respect of loss or damage caused to the said Alfred Brown by the said fire. Written notice of such assignment has not been given to the defendant.

132. The plaintiff British Colonial Fire Insurance Company Limited is not subrogated to the extent of the payment mentioned in para-

*In the
Supreme
Court of
Alberta,*

No. 2.
Statement
of Defence
October,
1932.
continued.

graph 77 of the Statement of Claim, nor at all to the right of recovery of the said Alfred Brown against the defendant for and in respect of loss or damage caused to the said Alfred Brown by the said fire.

133. John Jacobs did not own a stock of furs at 10657 Jasper Avenue in the vicinity of the Corona Hotel and on the same side of Jasper Ave.

134. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the premises occupied by the said stock of furs owned by John Jacobs, nor did the said John Jacobs suffer loss or damage thereby. 10

135. The said John Jacobs did not hold policies of insurance with the plaintiffs respectively mentioned in paragraph 82 of the Statement of Claim or any of them. The said plaintiffs were not, nor were any of them required by their several policies of insurance to pay anything to the said John Jacobs in respect of the loss or damage caused to the said John Jacobs by the said fire, nor have the said plaintiffs nor any of them paid to the said John Jacobs the amounts alleged in paragraph 82 of the Statement of Claim or any part thereof. The amounts of money set out in paragraph 82 of the Statement of Claim are not the amounts respectively at which the loss or damage caused to the said John Jacobs by the said fire were properly adjusted by and between the said plaintiffs respectively and of the said John Jacobs. Alternatively the alleged adjustments made between the plaintiff John Jacobs and the plaintiff Insurance Companies were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss. 20

136. In the alternative, the allegation that the plaintiff John Jacobs and the Insurance Companies referred to in paragraph 82 of the Statement of Claim adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action. 30

137. The plaintiffs mentioned in paragraph 82 of the Statement of Claim have not, nor have any of them, received from the said John Jacobs assignments of all right of recovery against the defendant to the extent of the payments made by the said plaintiffs respectively as set out in paragraph 82 of the Statement of Claim, nor did the assignments (if any) include the right of recovery of the said John Jacobs against the defendant to the extent of the said respective payments for and in respect of loss or damage caused to John Jacobs by the said fire. Written notice of such assignments or any of them has not been given to the defendant. 40

138. The plaintiffs respectively mentioned in paragraph 82 of the Statement of Claim are not, nor are any of them subrogated to the extent

of the payments respectively mentioned in paragraph 82 of the Statement of Claim, nor at all to the right of recovery of John Jacobs against the defendant for and in respect of loss or damage caused to the said John Jacobs by the said fire.

139. Canada Permanent Trust Company and H. T. Emery, Executors of the Estate of E. C. Emery, deceased, did not own a barn at 10044 106th Street, in the vicinity of the Corona Hotel.

140. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 10 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the premises owned by the Canada Permanent Trust Company and H. T. Emery, Executors of the estate of E. C. Emery, deceased.

141. The Canada Permanent Trust Company and H. T. Emery, did not hold a policy of insurance with the plaintiff Royal Insurance Company Limited. The said plaintiff was not required by its policy of insurance to pay anything to the said Canada Permanent Trust Company and H. T. Emery in respect of loss or damage caused to the said Canada Permanent Trust Company and H. T. Emery by the said fire, nor has the plaintiff paid to the said Canada Permanent Trust Company and H. T. Emery the amount alleged in paragraph 87 of the Statement of Claim or any part thereof. The amount of money set out in paragraph 87 of the Statement of Claim is not the amount at which the loss or damage caused to the said Canada Permanent Trust Company and H. T. Emery by the said fire was properly adjusted by and between the said Canada Permanent Trust Company and H. T. Emery and the said plaintiff Royal Insurance Company Limited. Alternatively the alleged adjustments made between the plaintiff Canada Permanent Trust Company and H. T. Emery, Executors of the Estate of E. C. Emery, deceased, and the plaintiff Royal Insurance Company Limited were not proper or bona fide 20 30 determinations of the alleged loss but in fact were assessments in excess of the true loss.

142. In the alternative, the allegation that the plaintiff Canada Permanent Trust Company and H. T. Emery, Executors of the Estate of E. C. Emery, deceased, and the Royal Insurance Company Limited adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

143. The plaintiff Royal Insurance Company Limited has not received from the Canada Permanent Trust Company and H. T. Emery any assignment of all right of recovery against the defendant to the extent of the payment made by the said plaintiff as set out in paragraph 87 of the Statement of Claim, nor did the assignment (if any) include the right 40

*In the
Supreme
Court of
Alberta*

—
No. 2.
Statement
of Defence
October,
1932.
continued.

of recovery of the said Canada Permanent Trust Company and H. T. Emery against the defendant to the extent of the said payment for and in respect of loss or damage caused to the said Canada Permanent Trust Company and H. T. Emery by the said fire. Written notice of such assignment has not been given to the defendant.

144. The plaintiff Royal Insurance Company Limited is not subrogated to the extent of the payment mentioned in paragraph 87 of the Statement of Claim, nor at all to the right of recovery of the said Canada Permanent Trust Company and H. T. Emery against the defendant for and in respect of loss or damage caused to the said Canada Permanent Trust Company and H. T. Emery by the said fire. 10

145. Edwin Ernest Kerswell did not have certain household effects in the Balmoral Block, referred to in paragraph 21 of the Statement of Claim.

146. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the said Balmoral Block, nor did the said Kerswell suffer loss or damage thereby.

147. Edwin Ernest Kerswell did not hold a policy of insurance with the plaintiff Winnipeg Fire Underwriters Agency. The said plaintiff was not required by its policy of insurance to pay anything to the said Edwin Ernest Kerswell in respect of loss or damage caused to the said Edwin Ernest Kerswell by the said fire, nor has the plaintiff paid to the said Edwin Ernest Kerswell the amount alleged in paragraph 91 of the Statement of Claim or any part thereof. The amount of money set out in paragraph 91 of the Statement of Claim is not the amount at which the loss or damage caused to the said Edwin Ernest Kerswell by the said fire was properly adjusted by and between the said Edwin Ernest Kerswell and the said plaintiff Winnipeg Fire Underwriters Agency. Alternatively the alleged adjustments made between the plaintiff Edwin Ernest Kerswell and Winnipeg Fire Underwriters Agency were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss. 20 30

148. In the alternative, the allegation that the plaintiff Edwin Ernest Kerswell and the Winnipeg Fire Underwriters Agency adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

149. Winnipeg Fire Underwriters Agency has not received from Edwin Ernest Kerswell any assignment of all right of recovery against the defendant to the extent of the payment made by the said plaintiff as 40

set out in paragraph 91 of the Statement of Claim, nor did the assignment (if any) include the right of recovery of the said Edwin Ernest Kerswell against the defendant to the extent of the said payment for and in respect of loss or damage caused to the said Edwin Ernest Kerswell by the said fire. Written notice of such assignment has not been given to the defendant.

10 150. The plaintiff Winnipeg Fire Underwriters Agency is not subrogated to the extent of the payment mentioned in paragraph 91 of the Statement of Claim, nor at all to the right of recovery of the said Edwin Ernest Kerswell against the defendant for and in respect of loss or damage caused to the said Edwin Ernest Kerswell by the said fire.

151. William Sinclair did not have any household effects in the house immediately to the West of the Corona Hotel.

152. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the said house immediately West of the Corona Hotel, nor did the said William Sinclair suffer loss or damage thereby.

20 153. William Sinclair did not hold a policy of insurance with the plaintiff Globe Underwriters Agency. The said plaintiff was not required by its policy of insurance to pay anything to the said William Sinclair in respect of loss or damage caused to the said William Sinclair by the said fire, nor has the plaintiff paid to the said William Sinclair the amount alleged in paragraph 95 of the Statement of Claim or any part thereof. The amount of money set out in paragraph 95 of the Statement of Claim is not the amount at which the loss or damage caused to the said William Sinclair by the said fire was properly adjusted by and between the said William Sinclair and the said plaintiff Globe Underwriters Agency. Alternatively the alleged adjustments made between the plaintiff William Sinclair and the Globe Underwriters Agency were not proper or bona fide
30 determinations of the alleged loss but in fact were assessments in excess of the true loss.

154. In the alternative, the allegation that the plaintiff William Sinclair and the Globe Underwriters Agency adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

40 155. Globe Underwriters Agency has not received from William Sinclair any assignment of all right of recovery against the defendant to the extent of the payment made by the said plaintiff as set out in paragraph 95 of the Statement of Claim, nor did the assignment (if any) include the right of recovery of the said William Sinclair against the defendant to

*In the
Supreme
Court of
Alberta*

—
No. 2.
Statement
of Defence
4th October,
1932.
continued.

the extent of the said payment for and in respect of loss or damage caused to the said William Sinclair by the said fire. Written notice of such assignment has not been given to the defendant.

156. The plaintiff Globe Underwriters Agency is not subrogated to the extent of the payment mentioned in paragraph 95 of the Statement of Claim, nor at all to the right of recovery of the said William Sinclair against the defendant for and in respect of loss or damage caused to the said William Sinclair by the said fire.

157. J. W. S. Chappelle was not a guest at the Corona Hotel at the time of the fire, nor were goods of his damaged therein. 10

158. J. W. S. Chappelle did not hold a policy of insurance with the plaintiff Provincial Insurance Company Limited. The said plaintiff was not required by its policy of insurance to pay anything to the said J. W. S. Chappelle in respect of loss or damage caused to the said J. W. S. Chappelle by the said fire, nor has the plaintiff paid to the said J. W. S. Chappelle the amount alleged in paragraph 99 of the Statement of Claim or any part thereof. The amount of money set out in paragraph 99 of the Statement of Claim is not the amount at which the loss or damage caused to the said J. W. S. Chappelle by the said fire was properly adjusted by and between the said J. W. S. Chappelle and the said plaintiff Provincial Insurance Company Limited. Alternatively the alleged adjustments made between the plaintiff J. W. S. Chappelle and the plaintiff Provincial Insurance Company Limited were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss. 20

159. In the alternative, the allegation that the plaintiff J. W. S. Chappelle and the Provincial Insurance Company Limited adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action. 30

160. The plaintiff Provincial Insurance Company Limited has not received from J. W. S. Chappelle any assignment of all right of recovery against the defendant to the extent of the payment made by the said plaintiff, as set out in paragraph 99 of the Statement of Claim, nor did the assignment (if any) include the right of recovery of the said J. W. S. Chappelle against the defendant to the extent of the said payment for and in respect of loss or damage caused to the said J. W. S. Chappelle by the said fire. Written notice of such assignment has not been given to the defendant.

161. The plaintiff Provincial Insurance Company Limited is not subrogated to the extent of the payment mentioned in paragraph 99 of the 40

Statement of Claim, nor at all to the right of recovery of the said J. W. S. Chappelle against the defendant for and in respect of loss or damage caused to the said J. W. S. Chappelle by the said fire.

*In the
Supreme
Court of
Alberta,*

*No. 2.
Statement
of Defence
4th October,
1932.
continued.*

162. T. Sinton did not have any any goods in the Balmoral Block mentioned in paragraph 21 of the Statement of Claim. Fire did not spread to the said Balmoral Block, as alleged in paragraph 22 of the Statement of Claim, nor were the said goods damaged thereby.

163. T. Sinton did not hold a policy of insurance with the plaintiff Glen Falls Insurance Company. The said plaintiff was not required by
10 its policy of insurance to pay anything to the said T. Sinton in respect of loss or damage caused to the said T. Sinton by the said fire, nor has the plaintiff paid to the said T. Sinton the amount alleged in paragraph 103 of the Statement of Claim or any part thereof. The amount of money set out in paragraph 103 of the Statement of Claim is not the amount at which the loss or damage caused to the said T. Sinton by the said fire was properly adjusted by and between the said T. Sinton and the said plaintiff Glen Falls Insurance Company. Alternatively the alleged adjustments made between the plaintiff T. Sinton and the plaintiff Glen Falls Insurance Company were not proper or bona fide determinations of the
20 alleged loss but in fact were assessments in excess of the true loss.

164. In the alternative, the allegation that the plaintiff T. Sinton and Glen Falls Insurance Company adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

165. Glen Falls Insurance Company has not received from T. Sinton any assignment of all right of recovery against the defendant to the extent of the payment made by the said plaintiff, as set out in paragraph 103 of the Statement of Claim, nor did the assignment (if any) include the right
30 of recovery of the said T. Sinton against the defendant to the extent of the said payment for and in respect of loss or damage caused to the said T. Sinton by the said fire. Written notice of such assignment has not been given to the defendant.

166. The plaintiff Glen Falls Insurance Company is not subrogated to the extent of the payment mentioned in paragraph 103 of the Statement of Claim, nor at all to the right of recovery of the said T. Sinton against the defendant for and in respect of loss or damage caused to the said T. Sinton by the said fire.

167. Sherwin Williams Company of Canada Limited did not have any
40 goods stored in the Corona Hotel.

*In the
Supreme
Court of
Alberta,*

No. 2.

*Statement
of Defence
4th October,
1932.
continued.*

168. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not cause loss or damage to the Sherwin Williams Company of Canada Limited.

169. Sherwin Williams Company of Canada Limited did not hold policies of insurance with the plaintiffs respectively mentioned in paragraph 108 of the Statement of Claim or any of them. The said plaintiffs were not, nor were any of them required by their several policies of insurance to pay anything to the Sherwin Williams Company of Canada Limited in respect of the loss or damage caused to the said Company by the said fire, nor have the said plaintiffs nor any of them paid to the said Company the amounts alleged in paragraph 108 of the Statement of Claim or any part thereof. The amounts of money set out in paragraph 108 of the Statement of Claim are not the amounts respectively at which the loss or damage caused to the said Company by the said fire were properly adjusted by and between the said plaintiffs respectively and the said Company. Alternatively the alleged adjustments made between the plaintiff Sherwin Williams Company of Canada Limited and the plaintiff Insurance Companies were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

170. In the alternative, the allegation that the plaintiff Sherwin Williams Company of Canada Limited and the Insurance Companies referred to in paragraph 108 of the Statement of Claim adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

171. The plaintiffs mentioned in paragraph 108 of the Statement of Claim have not, nor have any of them received from the Sherwin Williams Company of Canada Limited assignments of all right of recovery against the defendant to the extent of the payments made by the said plaintiffs respectively, as set out in paragraph 108 of the Statement of Claim, nor did the assignments (if any) include the right of recovery of the said Company against the defendant to the extent of the said respective payments for and in respect of loss or damage caused to the said Company by the said fire. Written notice of such assignments or any of them has not been given to the defendant.

172. The plaintiffs respectively mentioned in paragraph 108 of the Statement of Claim are not, nor are any of them, subrogated to the extent of the payments respectively mentioned in paragraph 108 of the Statement of Claim, nor at all to the right of recovery of the Sherwin Williams Company of Canada Limited against the defendant for and in respect of loss or damage caused to the said Company by the said fire.

173. Credit Foncier Franco-Canadian Company did not own premises immediately to the West of the Corona Hotel.

174. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the premises owned by the Credit Foncier Franco-Canadian Company, nor did the said Company suffer loss or damage thereby.

10 175. The Credit Foncier Franco-Canadian Company did not hold policies of insurance with the plaintiffs respectively mentioned in paragraph 113 of the Statement of Claim or any of them. The said plaintiffs were not, nor were any of them required by their several policies of insurance to pay anything to the Credit Foncier Franco-Canadian Company in respect of the loss or damage caused to the said Company by the said fire, nor have the said plaintiffs nor any of them paid to the said Company the amounts alleged in paragraph 113 of the Statement of Claim or any part thereof. The amounts of money set out in paragraph 113 of the Statement of Claim are not the amounts respectively at which the loss or damage caused to the said Credit Foncier Franco-Canadian by the said fire were properly adjusted by and between the said plaintiffs respectively and the said Company. Alternatively the alleged adjustments made between the plaintiff Hotel Company and the plaintiff Insurance Company were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

176. In the alternative, the allegation that the plaintiff Credit Foncier Franco-Canadian Company and the Insurance Companies referred to in paragraph 113 of the Statement of Claim adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

30 177. The plaintiffs mentioned in paragraph 113 of the Statement of Claim have not, nor have any of them, received from the Credit Foncier Franco-Canadian Company assignments of all right of recovery against the defendant to the extent of the payments made by the said plaintiffs respectively, as set out in paragraph 113 of the Statement of Claim, nor did the assignments (if any) include the right of recovery of the said Company against the defendant to the extent of the said respective payments for and in respect of loss or damage caused to the said Company by the said fire. Written notice of such assignments or any of them has not been given to the defendant.

40 178. The plaintiffs respectively mentioned in paragraph 113 of the Statement of Claim are not, nor are any of them subrogated to the extent of the payments respectively mentioned in paragraph 113 of the State-

*In the
Supreme
Court of
Alberta*

—
No. 2.
Statement
of Defence
4th October,
1932.
continued.

ment of Claim, nor at all to the right of recovery of the Credit Foncier Franco-Canadian Company against the defendant for and in respect of loss or damage caused to the said Company by the said fire.

179. Coughlin and Carroll did not carry on business as barbers in the Corona Hotel Barber Shop, on the Corona Hotel premises at the time of the fire, nor were any of their goods damaged thereby.

180. Messrs. Coughlin and Carroll did not hold a policy of insurance with the plaintiff British Colonial Fire Insurance Company. The said plaintiff was not required by its policy of insurance to pay anything to the said Messrs. Coughlin and Carroll in respect of loss or damage caused to the said Messrs. Coughlin and Carroll by the said fire, nor has the plaintiff paid to the said Messrs. Coughlin and Carroll the amount alleged in paragraph 117 of the statement of claim or any part thereof. The amount of money set out in paragraph 117 of the statement of claim is not the amount at which the loss or damage caused to the said Messrs. Coughlin and Carroll by the said fire was properly adjusted by and between the said Messrs. Coughlin and Carroll and the said plaintiff British Colonial Fire Insurance Company. Alternatively the alleged adjustment made between the plaintiffs Messrs. Coughlin and Carroll and the plaintiff British Colonial Fire Insurance Company were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

181. In the alternative, the allegation that the plaintiffs Messrs. Coughlin and Carroll and the British Colonial Fire Insurance Company adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

182. British Colonial Fire Insurance Company has not received from Messrs. Coughlin and Carroll any assignment of all right of recovery against the defendant to the extent of the payment made by the said plaintiff as set out in paragraph 117 of the Statement of Claim, nor did the assignment (if any) include the right of recovery of the said Messrs. Coughlin and Carroll against the defendant to the extent of the said payment for and in respect of loss or damage caused to the said Messrs. Coughlin and Carroll by the said fire. Written notice of such assignment has not been given to the defendant.

183. The plaintiff British Colonial Fire Insurance Company is not subrogated to the extent of the payment mentioned in paragraph 117 of the Statement of Claim, nor at all to the right of recovery of the said Messrs. Coughlin and Carroll against the defendant for and in respect of loss or damage caused to the said Messrs. Coughlin and Carroll by the said fire.

184. The Firestone Tire and Rubber Company did not have certain goods stored in the premises occupied by Motor Car Supply Company Limited.

*In the
Supreme
Court of
Alberta,*

185. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the premises occupied by the Motor Car Supply Company Limited, nor did the said Firestone Tire and Rubber Company of Canada Limited, suffer loss or damage thereby.

*No. 2.
Statement
of Defence
4th October,
1932.
continued.*

10 186. The Firestone Tire and Rubber Company of Canada Limited did not hold policies of insurance with the plaintiffs respectively mentioned in paragraph 121 of the Statement of Claim or any of them. The said plaintiffs were not, nor were any of them, required by their several policies of insurance to pay anything to the Firestone Tire and Rubber Company of Canada Limited in respect of the loss or damage caused to the said Company by the said fire, nor have the said plaintiffs nor any of them paid to the said Company the amounts alleged in paragraph 121 of the Statement of Claim or any part thereof. The amounts of money set out in paragraph 121 of the Statement of Claim are not the amounts
20 respectively at which the loss or damage caused to the said Company by the said fire were properly adjusted by and between the said plaintiffs. Alternatively the alleged adjustments made between the plaintiff the Firestone Tire and Rubber Company of Canada Limited and the plaintiff Insurance Companies were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss.

187. In the alternative, the allegation that the plaintiff the Firestone Tire and Rubber Company of Canada Limited and the Insurance Companies referred to in paragraph 121 of the Statement of Claim adjusted the alleged loss is frivolous, vexatious and embarrassing and dis-
30 closes no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

188. The plaintiffs mentioned in paragraph 121 of the Statement of Claim have not, nor have any of them, received from the Firestone Tire and Rubber Company of Canada Limited assignments of all right of recovery against the defendant to the extent of the payments made by the said plaintiffs respectively, as set out in paragraph 121 of the Statement of Claim, nor did the assignments (if any) include the right of recovery of the said Company against the defendant to the extent of the said respective payments for and in respect of loss or damage caused
40 to the said Company by the said fire. Written notice of such assignments or any of them has not been given to the defendant.

*In the
Supreme
Court of
Alberta*

No. 2.

Statement
of Defence
4th October,
1932.
continued.

189. The plaintiffs respectively mentioned in paragraph 121 of the Statement of Claim are not, nor are any of them subrogated to the extent of the payments respectively mentioned in paragraph 121 of the Statement of Claim, nor at all to the right of recovery of the Firestone Tire and Rubber Company of Canada Limited against the defendant for and in respect of loss or damage caused to the said Company by the said fire.

190. McDougall and Secord Limited did not own a dwelling which was damaged by fire as alleged in paragraph 124 of the Statement of Claim. 10

191. The fire referred to in paragraph 4 of the Statement of Claim was not caused in the manner referred to respectively in paragraphs 5, 6, 6(a), 7 or 7(a) of the Statement of Claim. The said fire did not spread and escape to the dwelling owned by McDougall and Secord Limited, nor did the said McDougall and Secord Limited suffer loss or damage thereby.

192. McDougall and Secord Limited did not hold a policy of insurance with the plaintiff London and Lancashire Insurance Company Limited. The said plaintiff was not required by its policy of insurance to pay anything to the said McDougall and Secord Limited in respect of loss or damage caused to the said McDougall and Secord Limited by the said fire, nor has the plaintiff paid to the said McDougall and Secord Limited amount alleged in paragraph 125 of the Statement of Claim or any part thereof. The amount set out in paragraph 125 of the Statement of Claim is not the amount at which the loss or damage caused to the said McDougall and Secord Limited by the said fire was properly adjusted by and between the said McDougall and Secord Limited and the said plaintiff London and Lancashire Insurance Company Limited. Alternatively the alleged adjustments made between the plaintiff McDougall and Secord Limited and the plaintiff London and Lancashire Insurance Company Limited were not proper or bona fide determinations of the alleged loss but in fact were assessments in excess of the true loss. 20 30

193. In the alternative, the allegation that the plaintiff McDougall & Secord Limited and the London & Lancashire Insurance Company Limited adjusted the alleged loss is frivolous, vexatious and embarrassing and discloses no cause of action against the defendant and should be struck out, and the defendant will so contend at or before the trial of this action.

194. The plaintiff London & Lancashire Insurance Company Limited has not received from McDougall & Secord Limited any assignment of all right of recovery against the defendant to the extent of the payment made by the said plaintiff, as set out in paragraph 125 of the 40

Statement of Claim, nor did the assignment (if any) include the right of recovery of the said McDougall & Secord Limited against the defendant to the extent of the said payment for and in respect of loss or damage caused to the said McDougall & Secord Limited by the said fire.

Written notice of such assignment has not been given to the defendant.

10 195. The plaintiff London & Lancashire Insurance Company Limited is not subrogated to the extent of the payment mentioned in paragraph 125 of the statement of claim, nor at all to the right of recovery of the said McDougall & Secord Limited against the defendant for and in respect of loss or damage caused to the said McDougall & Secord Limited by the said fire.

196. The plaintiffs J. R. Carroll and W. R. Coughlin did not sustain the damage alleged in paragraph 128 of the statement of claim or any part thereof.

197. In the alternative the said J. R. Carroll and W. R. Coughlin have been indemnified to the extent of their loss.

198. In the further alternative such damages are excessive and too remote.

20 199. The plaintiff J. R. Carroll did not sustain the damage alleged in paragraph 129 of the statement of claim, or any part thereof.

200. The plaintiff Motor Car Supply Company did not sustain the damage alleged in paragraph 130 of the statement of claim, or any part thereof. In the alternative, such damages are excessive and too remote.

201. In the alternative to the next preceding paragraph, the said plaintiff Motor Car Supply Company has been indemnified to the extent of such loss.

202. The plaintiff J. W. S. Chappelle did not sustain the damage alleged in paragraph 131 of the statement of claim, or any part thereof.

30 203. In the alternative, the said J. W. S. Chappelle has been indemnified to the extent of his loss.

204. In the further alternative such damages are excessive and too remote.

205. The plaintiff Corona Hotel Company Limited did not suffer the damage alleged in paragraph 132 of the statement of claim or any part thereof. In the alternative the plaintiff Corona Hotel Company Limited has been indemnified to the extent of such loss.

40 206. In the alternative to the next preceding paragraph, the damages alleged in paragraph 132 of the statement of claim are excessive and are too remote.

*In the
Supreme
Court of
Alberta*

—
No. 2.
Statement
of Defence
4th October,
1932.
continued.

*In the
Supreme
Court of
Alberta,*

*No. 2.
Statement
of Defence
4th October,
1932.
continued.*

207. Lucy Hawkins did not carry on the business of a boarding house keeper in premises injured by the fire as alleged in paragraph 133 of the statement of claim, nor did she suffer the damage alleged in the said paragraph or any part thereof. In the alternative the said Lucy Hawkins has been indemnified to the extent of her loss.

208. In the alternative to the next preceding paragraph, the damages alleged in paragraph 133 of the statement of claim are excessive and too remote.

DATED at the City of Edmonton, in the Province of Alberta, this 4th day of October, A.D. 1932, and delivered by Messrs. Milner, Carr, Dafoe & Poirier, Royal Bank of Canada Chambers, Edmonton, Alberta, Solicitors for the Defendant. 10

No. 3.

Order Reserving Matter of Damages.

Before The Honourable Mr. Justice Ewing } Friday, the 10th day of
In Chambers at Edmonton. } November, A.D. 1933.

(As Amended by Order of the Supreme Court of Alberta (Appellate Division), Dated the 27th November, A.D. 1933.) 20

Upon the application of the plaintiffs for final order for directions herein, in presence of Counsel for the defendant, upon hearing read the pleadings and proceedings had and taken herein and upon hearing what was alleged by Counsel for both parties.

1. It is Ordered that this action be set down for trial at the sittings of this Court for the trial of actions without a jury at Edmonton at such time as shall be fixed by the Clerk of the Court.

2. It is further Ordered that the matter of damages (if any) be reserved to be disposed of by the Trial Judge or as he may direct after the trial and disposal of the other issues in the pleadings raised. 30

3. It is further Ordered that the costs of this application be costs in the cause.

Entered this 14th day of November,
A.D. 1933.

R. P. WALLACE,
C.S.C.A.

R. P. WALLACE,
J.S.C.

“Approved as to form only,
Milner, Dafoe, Poirier & Martland,
Solicitors for Defendant.”

No. 4.

Opening of Proceedings at Trial.

*In the
Supreme
Court of
Alberta,*

—
No. 4.
Opening of
Proceedings
at Trial,
15th
January,
1934.

Evidence and proceedings at trial of this action before The Honourable Mr. Justice Ford at Edmonton, commencing at 10 a.m., Monday, January 15, 1934.

	Mr. S. B. Woods, K.C.,	Counsel for Plaintiffs
	Mr. S. W. Field, K.C.,	generally.
	Mr. H. A. Friedman, K.C.,	
10	Mr. J. E. Wallbridge, K.C.,	Counsel for the Plaintiff the
	Mr. L. Y. Cairns,	Corona Hotel Company Limited.
	Mr. Geo. B. O'Connor, K.C.,	Counsel for the
		Plaintiff Chappelle.
	Mr. Ranald White,	Counsel for the Plaintiff
		Motor Car Supply Company Limited.
	Mr. A. L. Smith, K.C.,	
	Mr. H. R. Milner, K.C.,	Counsel for the
	Mr. S. C. S. Kerr,	Defendant.
	Mr. R. Martland,	

20 MR. WOODS: I am appearing with my friend Mr. Friedman for the plaintiffs generally and Mr. Field will be with me later. Then in the Order for Directions filed on the 10th of November you will observe: "It is further ordered that the matter of damages if any be reserved to be disposed of after the trial and disposal of the other issues in the pleadings raised." On that matter there is appearing with me for the Corona Hotel Company Limited my friend Mr. Wallbridge and my friend Mr. Cairns. And Mr. O'Connor is with me for the plaintiff Chappelle. And my friend Mr. Ranald White is with me in the same way for the plaintiff the Motor Car Supply Company, although he is not here.

THE COURT: All these gentlemen are with you?

30 MR. WOODS: Yes.

THE COURT: You are in control generally?

MR. WOODS: Yes.

MR. SMITH: In association with my friend Mr. Milner I am appearing for the defendant and Mr. Kerr and Mr. Martland are with us.

MR. WOODS: As you will observe by the Order for Directions the issue of damages is segregated to be disposed of after the other issues in the action or as Your Lordship may determine. It will appear as I pro-

*In the
Supreme
Court of
Alberta*

No. 4.

Opening of
Proceedings
at Trial,
15th
January,
1934.
continued.

ceed that the other issues in the action other than the matter of liability present no difficulty because by arrangement with my learned friends, as I will show by the admissions that are made, the matter of liability is the matter that will occupy Your Lordship's attention. I will file the admissions and make the verbal admissions that were agreed on. So we are narrowing the matter down as much as possible and it will be really on the issue of liability. Now I think it will be convenient in order to assist Your Lordship on the understanding of the case to direct Your Lordship's attention to the particular way in which evidence is to be led that I should open the case as briefly as possible.

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The action concerns the alleged liability of the defendants—for this purpose we will call them the Gas Company—for a fire that happened and burned down the Corona Hotel on Jasper Avenue in Edmonton on the night of the 21st February, 1932. The evidence that will be led on behalf of the plaintiff will show that that fire was caused by the igniting of an inflammable mixture of gas and air in the basement of the Corona Hotel. The manner in which the gas entered the basement of the Hotel as far as the evidence of the plaintiff is concerned, will be along the line that I am very briefly going to state and for the purpose of understanding it I am asking Your Lordship to look at a blue print which I will be putting in immediately, and which is Exhibit 9 on the examination for discovery of the manager of the Gas Company, which is to be read by me as the first part of my evidence. The evidence of the plaintiff, My Lord, will indicate that the gas that was ignited and caused the fire, escaped from a break in the 12-inch gas main of the defendant company, which break happened at a welded joint of that 12-inch high pressure main at the corner of 107th Street and the lane immediately behind Jasper Avenue shown on the plan before Your Lordship. That break in that welded joint was, in the submission of the plaintiff, caused by the main sinking some 6½ inches from the level and sinking on account of the tension of the ground and the sinking of the pipe, and other causes—caused a break about 6 inches long around the 12-inch pipe. The pipe is 12 inches in diameter. And the gas rushed out at a high speed. It is the high pressure main, and the gas had a pressure of 34 pounds at that point. And that escaping gas found access to the basement largely by running along the conduit box 6 by 4 which is just near to the main. There is the place of the alleged break (indicating on blue print plan). The boxed culvert is inside that and it passes down the rear lane from Jasper Avenue. Now this conduit is a wooden box, it is out of repair, it is rotten and it could easily escape through that and it formed a natural conduit for the gas to go from the place of the break down the lane and seeping out through that box culvert it seeped through the soil and into the apertures in the hotel which will be shown in evidence, and it seeped through brick as we will show and it seeped through places in the walls and through cracks and

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into the basement in that place. Getting in there it will be shown by evidence to be led how at about nine o'clock at night or a little after nine o'clock—the alarm was eleven minutes after nine—but a little after nine o'clock it became ignited by one of the employees in the hotel who went to the basement in the course of his duties then and the break at the weld was the place where it was escaping from and the gas escaping ignited and caused the fire and burned down the whole hotel. The firemen duly arrived shortly after the alarm but owing to the nature of the flame it was impossible for them to get the fire under control. As you will see,

10 this state of facts gave rise upon the submission of the plaintiffs to liability upon various grounds. The first ground in the order mentioned in the Statement of Claim is the ground that the defendants being the owner of a dangerous thing—natural gas—keep that natural gas at their peril and in allowing it to escape from their pipes into the basement of the hotel are liable. The second way the matter is put is that they are in breach of their statutory obligations to so construct their facilities, under the legislation that applies to them, so as not to endanger the public health and safety. That obligation is put upon them by the Act called the Water,

20 Gas, Electric & Telephone Companies Act of the Province. And in that regard it may be useful to me to indicate to Your Lordship the principal points although not all the points that the plaintiff is relying on to show breach—in constructing the pipe in that way. The statute says construct. The decisions say that means construct and maintain, but what I am presently concerned in is to give Your Lordship an idea of what we say was wrong with the construction so that when the evidence is led you will have some idea of what we are at. In the first place we say the pipe was a 12-inch high pressure main—it was improperly laid because it was not laid in an open trench. That is to say, ground was not dug all the way and the pipe put on the bottom of the soil, on the virgin soil. It was

30 laid by being welded together in joints, there would be 80 feet of rigid pipe and it was welded together in the middle and at this weld it broke and it was put through by a tunnel being made underneath the pavement of the street and hauled through that tunnel. It rested, as we will lead evidence to show, on what is known as filled ground, that is, not the virgin soil or solid earth, and having been pulled through this tunnel the workmen would fill in by pushing or getting earth underneath the pipe and in that way it did not rest on a solid foundation, with the result that it sank down some 6½ inches between the two sides of the street and forces that will be indicated caused the pipe to break at the weak point

40 which was the weld, in the middle of the street. The weld is an oxy-acetylene process. That is the first ground or one of the grounds upon which we say the construction was improper. The second is that the weld that I have described that broke was an improper weld, improperly made—weakly made. Evidence will be led to show that fact. And the

*In the
Supreme
Court of
Alberta,*

No. 4.
Opening of
Proceedings
at Trial,
15th
January,
1934.
continued.

*In the
Supreme
Court of
Alberta*

No. 4.

Opening of
Proceedings
at Trial,
15th
January,
1934.
continued.

pipe was taken off and a piece of it will be before Your Lordship and there will be a good deal of evidence upon that subject, expert as well as other evidence, but that we rely on very strongly—that the weld was an improper weld in so much as primarily the welding material did not penetrate through the two ends of the pipe, only a portion of the way, and that that should not have been, and that and other causes that have to do with that break caused a great weakness in the weld at that point, and it is quite clear that it broke because of that weakness. We say that is an improper construction. Then there will be indicated too in the evidence that the position of the weld, the position of the pipe and the operating of a welded pipe at the point where it was put was improper; that is to say, it should not have been in the condition it was within the frost line and near to one of the City manholes as you see on the plan. The City manhole will come in for a good deal of discussion. You will see it is indicated on the plan (indicating). And the next cause of action that I am going to enumerate necessarily dovetails to some extent with this, because these matters as well as other matters that might go to construction and maintenance and do go necessarily are put forward, not merely as a breach of the statutory duty as mentioned but also as negligence independently of the statutory duty and these ones I have mentioned are among the allegations of negligence also. The next cause of action mentioned in the Statement of Claim is in nuisance. That is to say that this is a private nuisance. That is, as Your Lordship will know, another way, in my humble estimation, of putting the first cause of action. I have been under the impression and still am that the rule as to the escape of a dangerous thing is more on the ground of nuisance than anything else. But I need not elaborate that. And the same facts that will be alleged constitute negligence. Affirmatively we allege them as negligence and entitling the plaintiffs to succeed in addition to the general rule of the keeping of a dangerous thing at their own peril, and these allegations of negligence are set out in the Statement of Claim, they constitute the same submissions, the same allegations, or rather the same matters that I have mentioned in connection with the breach of the statutory duty, namely, the negligent manner of the construction of the pipe in the manner that I have stated—the negligent welding of the pipe in the manner I have stated, the negligent position of the pipe in the manner I have stated. And then it is alleged that the defendants are negligent in failing to inspect the pipe holding gas in highly dangerous quantities, and evidence will be submitted to show that at the time of the fire no system of inspection and certainly no adequate system of inspection was in force at all to enable any escape of gas to be detected and that, we allege, is negligence. Then we allege it as being negligent that the defendants failed to have an odorizing agent in their pipe. Evidence will be led to show that this natural gas is—while it may be smelled or tasted if it is in large quantities and under certain conditions that none the less

speaking generally it is non-odorous gas and its escape cannot readily be detected. And that being so we say it is negligence for the defendants not to have had an odorizing agent in the gas. We will lead evidence to show that the state of the construction of that time was of such a character that that was a reasonable precaution for them to take at that time. Then we allege as negligence the failure to repair the pipe promptly especially the pipe across 107th Street at the corner of the lane because of the fact that this was known to the Gas Company as being a weak spot in their system and should have been specially watched. That, I think, makes up the paragraphs of the Statement of Claim that allege negligence.

Then we also allege that this set of facts and other facts that will appear in evidence justify the finding that the gas main of the defendant constitutes a public nuisance, causing special damage to the plaintiffs and therefore actionable. We will prove in evidence that within a relatively short time, a year or so before this, breaks had happened in the mains of the defendant in various parts of the City to the danger and damage of the citizens and that sufficient of the citizens were affected to justify this condition being regarded as a public nuisance. A sufficient amount of the public are affected to justify that conclusion. Now that, I think, constitutes the various ways or causes of action, in which the facts that will be put in evidence, will be put before the Court. Your Lordship will observe on the plan that there are various City services—water and sewer construction, at that corner some of which are underneath. Here is a table of elevations, at that corner there are various City services, the sewer services and a weir chamber at that manhole, that is 7 feet as shown by the elevations, underneath where this 12-inch pipe was. The 12-inch pipe was a distance down from the pavement 3 or 4 feet and some of these services were underneath it and underlay the 12-inch main. Now evidence will be led—whether it is strictly necessary for us to do so—it is more convenient for us to do so, having regard to the way our evidence will be submitted, to indicate that these City services did not in any wise let the intervening ground down so as to cause or to be contributory to the sagging of the 12-inch main at that point. That might be more properly rebuttal because the matter is raised by way of defence. But in view of the fact that some of the witnesses that will be called in chief to speak about other matters, especially the expert witnesses, necessarily go into that feature but I have concluded that I am going to put in all my evidence on that subject in chief. The suggestion is therefore, that there are these under services of the City and it is possible that they let the ground down, and I am going to try to satisfy the Court that there is nothing in that supposition. Now that, I think, My Lord, gives an outline of the way the evidence will be led.

*In the
Supreme
Court of
Alberta,*

—
No. 4.
Opening of
Proceedings
at Trial,
15th
January,
1934.
continued.

Application for Amendment to Statement of Claim.

No. 5.
Application
for Amend-
ment to
Statement
of Claim,
15th
January,
1934.

There is an amendment, as usual, that I am asking for to the Statement of Claim which I understand my friend is opposing but I do not think it will give us any trouble now, at all events. It has to do with the special claim of the Corona Hotel Company Limited, that is to say, in addition to the insurance end, the Corona Hotel Company Limited being added as plaintiffs made a claim over and above the amount for which they were insured and that claim appears as paragraph 132 of this Statement of Claim. Now this paragraph that I am asking to insert I am asking to insert immediately after that as 132A and I will put a copy in. This is the way it will read: 10

“In the alternative the plaintiff Corona Hotel Company Limited has “suffered loss and damage in the sum of \$59,894.84 for the difference between the actual value of the property destroyed and the amount received from the several insurance companies as mentioned in paragraph 8, “for the loss of profits during the time required for re-construction and “the recovery of business lost by the said fire, for the salaries of officers and employees and taxes required to be paid during the same period, for “the loss of good will, and for the loss occasioned by capital increase re-quired on re-construction to conform to City building ordinances.” That alternative claim was by oversight omitted from the original and some time ago I wrote my friend asking his consent to a paragraph being put in not like that but of a different character, and the claim in this form being submitted I asked by a letter of the 28th of November that consent be given to amend the pleadings at the trial by putting in paragraph 132A. My friend, Mr. Milner, replied asking me to give particulars of the matters alleged in that paragraph that I have read. My reply to him was that I had not presently the particulars, that I did not think this was the time to give them in view of the fact that the Order for Directions provided that the matter of damages was to be separately dealt with and that when the matter of damages came to be dealt with that the matter of the particulars of this added paragraph would then be gone into and necessarily given because that would be the time to make them up. 20 30

THE COURT: I suppose, just there, there might be some discussion as to what is meant by liability because if the objection to this amendment is that the damages as alleged are too remote then it would be a question of law based upon facts to be proved.

MR. WOODS: Still it does go to damages and that is a matter for Your Lordship’s consideration, under the Order for Directions, and I think it is possible Your Lordship may find it useful or necessary to have argument on that subject after the question of the liability for the fire is determined—the question of the liability for damages caused by the fire by 40

reason of being too remote, if that is a possible submission to make in respect of this I think that comes under the Order for Directions—or the additional words “the matter of damages if any be reserved to be disposed of by the Trial Judge or as he may direct after the trial.” Those latter words were put in by the Court of Appeal. So Your Lordship is quite right in stating that if necessary that may be argued before Your Lordship later on and when we come to the question of damages. It was on that ground I suggested to my friend that the question of particulars of damages would have to be dealt with then, but I assumed—I think I am right
 10 that at this point—I should apply for the amendment so that the pleadings may be put into shape, and I ask for the amendment.

MR. MILNER: We cannot agree to the amendment, My Lord. Mr. Woods said he wrote me this letter, and we replied asking him to furnish us with particulars, and we said on receipt of that information we would then let him know what we were disposed to do. Now it is almost impossible for me to say anything about this proposed amendment because I do not know what it relates to except in a general way. When Mr. Woods furnishes us with particulars then we will know whether we want to oppose it or not and also whether we want to examine for discovery in
 20 connection with these matters. But as it stands now there is nothing before Your Lordship on which any Order should be made one way or the other.

THE COURT: Do I understand that your objection is not to the claim as proposed to be set up in paragraph 132A as if you were arguing a demurrer, but your objection to the proposed amendment is because you have not got the particulars of what it relates to?

MR. MILNER: No, sir. My real objection is this, that the paragraph is so drawn that I do not know what there is there without particulars. I do not know what is demurrable, really.

THE COURT: Is not the question open on the terms of what has
 30 been read to me?

MR. MILNER: You see, it involves a great many difficulties. They first set out \$59,000—

THE COURT: Have you a copy, Mr. Woods?

(Mr. Woods hands copy to Court).

MR. MILNER (Reading): “For the difference between the actual value of the property destroyed and the amount received from the several insurance companies as mentioned in paragraph 8 and then next for the loss of profits during the time required for reconstruction and the recovery of business lost by the fire and for the salaries of officers and employees and taxes required to be paid during the same period and for the
 40 loss of good will and for the loss occasioned by capital increase required on reconstruction to conform to City Building Ordinances.”

*In the
 Supreme
 Court of
 Alberta,*

No. 5.

Application
 for Amend-
 ment to
 Statement
 of Claim,
 15th
 January,
 1934.

continued.

THE COURT: I suppose the first part would not have been demurrable—

MR. MILNER: I would think the first part probably would not be.

THE COURT: And surely the rights involved ought to be completely determined so far as they can be if this claim should be put forward? I am speaking only of the difference in the amount that is claimed?

MR. MILNER: Yes.

THE COURT: What they say is the actual damage to their property in addition to what they say they have been indemnified for. That is what the first part is. 10

MR. MILNER: Yes, that is only one part.

THE COURT: And the rest, I think it could be said is too remote too.

MR. MILNER: My idea is if the amount were allowed then the question arises about a further examination for discovery because I do not know whether \$59,000 is the difference between the value of the property and the money covered by the insurance, or whether it is the reverse.

MR. WOODS: It is put in an alternative form.

MR. MILNER: It is put in a totally different form. It is something entirely different. 20

MR. WOODS: If there is any necessity for further examination for discovery of course Your Lordship can preserve that right and we have not any objection.

MR. MILNER: If my friend wanted to get this amendment I submit he should at least have furnished us and the Court with particulars and not with a meagre fare like this.

THE COURT: I think the amendment should be granted but every opportunity should be given for discovery if it is necessary. In granting the amendment I do not desire to express any view at all as to the question of remoteness as to the latter parts of the paragraph. 30

MR. MILNER: And I suppose the question of costs may be spoken to later?

THE COURT: Oh yes, all questions of costs. Now you have opened very well on your statement of claim. Is it desired now that I may be told what the pleadings are?

MR. SMITH: I do not care to open at this time, sir. I am so certain my friend cannot prove to you what he has laid out and I do not desire to answer what he cannot prove.

No. 6.

Admission of Facts By Defendant.

*In the
Supreme
Court of
Alberta,*

No. 6.
Admission
of Facts by
Defendant.
15th
January,
1934.

MR. WOODS: Well the statement of defence is really a denial of these things. And there are certain admissions asked for and made. I found when I got the record printed—that it was not the habit to introduce admissions. Now I asked for certain admissions. I need only refer to one set of them because the same kind of admissions follow along in connection with each of the other policies and assignments. (Reading to end of Paragraph 5 of “Admission of Facts.”) The names of the insurance companies and the amounts for each loss so paid follow opposite the names of the insurance companies. That is in paragraph 8 of the statement of claim and paragraph 9 alleges (reading) and then paragraph 10 (reading).

Now that is three and the others follow along in the same kind of order and are paragraphed in the same way.

The admissions refer to that (reading). Then following along to paragraph 82 of the statement of claim there are the same three admissions in connection with the corresponding paragraphs in the statement of claim referring to the other. I will file the admissions.

20 **Admissions of Facts Pursuant to Notice, Marked
Exhibit 1.**

MR. WOODS: The difficulty of those admissions, the insurance policies the fact of the insurance by the insurance companies of these various plaintiffs in those amounts was not specifically admitted nor was it specifically admitted that the insurance companies had paid the various amounts that are mentioned and that each of the individual plaintiffs had received the amounts for which suit was brought. Consequently I am filing by arrangement with my friend the insurance policies. Now most of these are the originals and some are copies but no objection is taken to the fact that the copies are copies and not originals. I suggest they be marked as one exhibit. It is possible we will not need to refer to them at all. They have been carefully checked over and they do include all the policies.

30 **Bundle of Insurance Policies marked Exhibit 2.
Receipts for the amounts in the Statement of Claim referred
to and contained in the claim of the Insurance Companies,
Marked Exhibit 3.**

MR. WOODS: Now it is alleged in connection with the Motor Car Supply Company, and similarly with the other plaintiffs, there was no admission of fact. And in order to obviate the necessity of having that

40

*In the
Supreme
Supreme
Court of
Alberta*

No. 6.
Admission
of Facts by
Defendant.
15th
January,
1934.
continued.

formal matter proved by calling each of these parties here it has been agreed that this form of admission, or an admission in form, is to be put on the record.

That the insured parties as mentioned in the Statement of Claim other than the insurance companies, each have an interest in the subject matter of the action so as to support a claim for damages against the defendant if the liability of the defendant is established before Your Lordship. The amount of that and the quality of their interest is to remain for determination at the subsequent hearing on the matter of damages.

10

MR. MII NER: If this goes no further than saying that the plaintiffs had some property, which they allege they have, it is unobjectionable. But I wish to say that no evidence that is now being put in should be at any time construed as an admission that the plaintiffs or any of them did suffer damage or that the payment by the insurance companies to them of any monies under the policies establishes that the plaintiffs other than the insurance companies suffered any damage or damage equivalent to the amount paid to them by the insurance companies. That is rather an involved statement but I think that covers my ground.

20

MR. WOODS: Take an example, Paragraph 11 (reading). Now that is admitted. It is not necessary for us to call somebody from the Motor Car Supply Company to prove that fact. And it is thought that this admission in effect covers all the plaintiffs. That is to say, that they are interested generally and if there is liability they have a sufficient interest, whatever the amount of it—and the making of the admission does not in any wise bind my friend to admit there was a scintilla of damage; but it is assumed for the purpose of this hearing that they have an interest sufficient to support a claim for damage if there is any liability and the amount of damage and the quality of interest is to be hereafter reserved. Now I think that really narrows the case down to bare bones as much as a case of these dimensions can be.

30

MR. WOODS: It is agreed that these two plans be put in showing the layout of the Corona Hotel and the store and the basement. My friends do not bind themselves to anything more than that these are properly sketched. The object of putting them in is when you come to the witnesses' evidence, Your Lordship will understand what they mean when they say "in this, that or the other place."

**Sketch showing lay-out of the basement of the premises in question, marked
Exhibit 4.**

40

**Sketch showing lay-out of ground floor of the premises in question, marked
Exhibit 5.**

No. 7

**Extracts from Examination for Discovery of Julian Garrett,
Manager of the Defendant.**

*In the
Supreme
Court of
Alberta,*

No. 7

Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.

I am reading now from the examination of Julian Garrett the manager of the defendant.

"2. Q. MR. WOODS: Mr. Garrett, what position do you occupy with the Northwestern Utilities, Limited? A. I am a director and Manager and Secretary-Treasurer.

"3. Q. And is it a Provincial corporation, or Dominion corporation?
10 A. Dominion.

"4. Q. And is it formed under the Dominion Companies Act, do you know? A. Yes.

"5. Q. Or by special Act?

MR. MILNER: The Dominion Companies Act.

"6. Q. MR. WOODS: And what was the date when it was formed?
A. May 26th, 1923.

"7. Q. That is the date when it was formed, pursuant to the Dominion Act, by letters patent? A. Yes.

"8. Q. It is a letters patent company, I mean? A. Yes."

20 "27. Q. Mr. Garrett, this distributing system in the City of Edmonton was constructed, as I take it, in 1923? A. Yes.

"28. Q. And under contract by the defendant Company with some contractor? A. Yes.

"29. Q. And you produce that contract in your Affidavit on Production? A. Yes.

"30. Q. And this is the contract between S. M. Williams, J. R. and D. R. Williams, carrying on business under the name of Williams Brothers, and your Company, under which the distributing system in the City of Edmonton, among other things, was constructed by the Company?
30 A. Yes, that is the Agreement.

MR. MILNER: Mark it subject to objection.

**Agreement re Construction and Specifications, Marked
Exhibit 6.**

"36. Q. Now I notice that this Contract, Exhibit 1, is dated the 22nd of July, 1923. Can you tell me when the construction started to be made of the distribution plant and the distribution system in Edmonton?
A. I think the first pipe arrived in the City on July 6th, 1923, and they started trenching immediately, and the first pipe was laid on July 23rd, 1923. That is the nearest information I have.

40 "37. Q. We are speaking of the distribution system in Edmonton?
A. Yes.

*In the
Supreme
Court of
Alberta*
—
No. 7
Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.
continued.

"38. Q. And the work proceeded continuously from the time of the laying of the first pipe? A. Yes.

"39. Q. The trenching and laying? A. Yes.

"40. Q. And how long did it take; when was it completed? A. It was completed very near the end of October. I know that the first consumer was turned on, on the 1st of November, 1923.

"41. Q. And can you give me any information as to when the pipe along the lane South of Jasper Avenue, behind the Corona Hotel, was laid?

WITNESS: Which pipe do you refer to?

10

"42. Q. The intermediate pressure, twelve-inch pipe? A. That was laid, I think, on August 17th. The ditching was done for it on August 16th, and the pipe laid on August 17th.

"43. Q. 1923? A. 1923.

"44. Q. MR. MILNER: It was the 17th and 18th, wasn't it? A. Yes. The ditching was on the 17th, and the laying was on the 18th.

"45. Q. MR. WOODS: That is, the laying was completed from Sixth Street to Seventh Street, or how much was ditched and laid? A. There was one thousand feet of ditch opened on August 17th.

"46. Q. From where? A. From 105th Street to 108th Street, I think. 20

"47. Q. Along that lane? A. Yes.

"48. Q. And how deep was that ditch? A. About three feet. It varied, between 106th Street and 107th Street, because my information is that there had been a grade established by the City there, the lane not being paved at the time, and the contractor was supposed to lay the pipe so it would be a certain depth below the ultimate grade.

"49. Q. What depth below the ultimate grade; can you remember? A. It was to be thirty-six inches.

"50. Q. Below what the grade would be when the grade was correct? A. Yes." 30

"53. Q. And the pipe then was laid, on the following day, over all that section, according to your records? A. There was eleven hundred feet of pipe laid on August 18th from 105th Street to a point East of 108th Street."

"61. Q. Can you tell me where the frost line is in that place, Mr. Garrett—where the frost line in the winter is? A. I imagine it is from six to seven feet.

"62. Q. Six to seven feet down? A. Yes.

"63. Q. So that I am right in stating that, when this pipe was laid by the company, it was laid through ground which in the winter would be in the frost? A. Yes." 40

“68. Q. Will you just tell me what the method is of the distribution of the gas from the field to the consumer? A. Well, we have a number of wells in the Viking Field. The gas is conveyed from the field to our field station at Viking, where it is measured and the pressure regulated, and the gas passes through approximately seventy-seven miles of transmission line to the City of Edmonton, and arrives at what we call our Number 1 Regulating Station, in Bonnie Doon. There the gas is again measured, and reduced to approximately forty pounds pressure.

10 “69. Q. That is, forty pounds to the square inch? A. Forty pounds to the square inch. The gas is fed into the intermediate pressure line at that station, and those intermediate pressure lines loop, to a considerable extent, the City.

“70. Q. They go around the City? A. Yes. We call it a belt line. That line crosses on the Low Level Bridge, and there is another line that crosses on the Fifth Street Bridge. Then, along the intermediate pressure belt line, we have a number of pressure regulating stations, where the pressure is reduced to about four ounces pressure, and fed into the low pressure distribution mains.

20 “71. Q. Is the stepping down gradual? A. There is a stepping down at Number 1 station, from the pressure at the end of the transmission line to forty pounds pressure. Then, at the smaller regulating stations, located along the intermediate line, the pressure is reduced to four ounces pressure.

“72. Q. Ultimately, or gradually? A. No. It is brought right down to that, in that station.”

30 “79. Q. I want to see how that part of the intermediate pressure main is connected up with the general loop? You have produced a map which was prepared by the City? A. Yes. (Producing). The belt line surrounds the City, and that only conveys the gas to these regulating stations, where the pressure is reduced; and, from those stations, the gas passes into the low pressure distribution system and the consumer received the gas.

“80. Q. But what I am still hazy about is how this intermediate pressure main gets out behind the Corona Hotel, because it is not part of the belt line? A. Oh yes, it is.

40 “81. Q. Then the belt line doesn't go around the outside of the City? A. Oh no. This intermediate pressure line comes up 105th Street, and then it turns West on the lane South of Jasper Avenue, and the portion of that intermediate pressure line West of this point on 105th Street, in the lane South of Jasper Avenue is not belted. The belt goes back in an Easterly direction to 100th Street, and then back across the Low Level Bridge.

“82. Q. What happens to this part that goes West from 105th Street? A. Well, just South of McDougall School, approximately at 98th Avenue, and a lane between 104th and 105th Streets, there is our

*In the
Supreme
Court of
Alberta,*

No. 7

Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.
continued.

Regulator Station Number 4. Then Regulator Station Number 5 is on the lane North of Jasper, between 115th and 116th Streets; and this line passing through the lane between 106th and 107th Streets is the line which is carrying the gas from Number 4 right up to Number 5."

"87. Q. Let us get back to the line between 106th and 107th. That intermediate pressure line going West from 105th Street, where does that district get its distribution from? A. Well, there is a regular station here, Number 4.

"88. Q. At Fifth Street? A. Yes. And this is 5; this is at 107th Avenue; I don't remember the exact location of Number 7; I think it is West of 96th Street, at about 106th Avenue. 10

"89. Q. And where does the territory between 106th and 107th South of Jasper, get its distribution from; from what intermediate pressure station? A. In this district, the low pressure lines are all belted, so as to equalize the pressure in them, and the gas is being fed into these low pressure lines from Number 4 here, and from Number 7 here.

"90. Q. Then this intermediate pressure pipe that is along the lane South of Jasper goes in the way that you have marked on this rough plan; and the distribution system, which is the ten-inch main, isn't it— That is the low pressure main? 20

WITNESS: You are referring to the ten-inch low pressure line south of Jasper, on the lane?

"91. Q. Yes. Now that gets its gas, you tell us, from both Number 4 intermediate pressure station, and Number 7, and maybe some others? A. Yes.

"92. Q. After the gas has been stepped down from forty pounds to the square inch, to how much to the square inch? A. Four ounces.

"93. Q. And that gas then goes in this low pressure main, which we will identify on the plan presently, and from that main it is distributed to the consumer? A. Yes. 30

(Sketch referred to put in and marked Exhibit 4)

MR. WOODS: Mr. Milner, you got, I have no doubt, a copy of this plan of the City Engineer's, showing the elevation?

MR. MILNER: Well, my recollection is that they prepared a second one, after this.

"94. Q. MR. WOODS: Did you check it on that one, to see that this tabulation of elevations is correct? A. No. There is no way that we can check it.

"95. Q. It gives on this plan, as you see: "Twelve inch gas main intermediate pressure, constructed in 1923. Ten inch gas main, low pressure, constructed in 1923." A. Yes. 40

"96. Q. And I would like you to identify this as the street railway return cable, in a six by ten wooden box. That is shown there? A. Yes.

"97. Q. And the elevation of these gas mains, and the elevation of the wooden boxes, would be, I have no doubt, correctly given here, but I would like you to check them, if you don't want to verify them now?

A. Well I can't verify them now.

"98. Q. But you can, by information in your own possession, verify that plan? A. Yes, I think so.

(Blueprint referred to marked "A" for identification).

Plan showing gas regulator stations, marked Exhibit 7.

10 "108. Q. And the intermediate pressure main is a twelve-inch main, and the low pressure a ten-inch main? A. Yes.

"109. Q. And do they lie side by side? A. Yes—they are parallel.

"110. Q. They are in the same trench, are they? A. Well, they were not laid at the same time. They were not laid in the same trench that was opened, at the one time. The intermediate pressure line was laid first, and it was filled in, and then excavated again and the low pressure line laid.

"111. Q. Would it be laid on the same level, or are they laid one on top of the other? A. The ten-inch is a little bit above the twelve-inch line.

20 "112. Q. At the time of the laying of this intermediate pressure main by Williams Brothers for the Company, I would take it that the Company did have inspectors who watched the construction? A. Yes."

"120. Q. What tests were made of the pipe as laid, do you say? A. All I know is that it was provided in the Contract with Williams Brothers that those intermediate pressure lines should be tested to 100 pounds pressure, and that the low pressure lines would be tested to a pressure of 15 pounds.

"121. Q. And you presume, of course, that that test was made? A. Yes.

30 "122. Q. And it was an air pressure test? A. Yes.

"123. Q. What is an air pressure test? A. It is simply blocking the line, and pumping air into it until you get a certain pressure.

"124. Q. And then seeing if any of that air escapes? A. Yes.

"125. Q. And is that the only test that was made of those pipes as laid, according to your information? A. I don't know.

"126. Q. Was there any other provided for in the Contract, that you know of? A. No, I don't think there was any other provision for testing."

40 "129. Q. But was there any hydro-static test of the pipe as laid in the trench? A. No.

"130. Q. Just the air pressure test, as far as you know? A. Yes.

"131. Q. Was there any test made of the pipe when laid, by a hammer—a hammer test? A. I don't know.

"132. Q. You never heard of any? A. No. You understand that I wasn't working on the construction."

*In the
Supreme
Court of
Alberta,*

No. 7
Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.
continued.

"156 Q. MR. WOODS: You are aware that there was a fire, on the night of the 21st of February, 1932, which burned down the Corona Hotel? A. Yes.

"157. Q. And you are aware of the fact that we have brought an action against the Gas Company alleging that it was gas escaping from this intermediate pressure pipe that caused that fire; you know that that is what this action is about, don't you? A. Yes."

MR. SMITH: Don't you think in the last you have read you should have gone back a couple of questions?

THE COURT: Are you making an application? 10

MR. SMITH: I think Mr. Woods should perhaps read to your Lordship the three preceding questions in order to make it plain.

THE COURT: You asked me to look at 127 and 128?

MR. SMITH: Yes, My Lord.

MR. WOODS: I do not think they explain anything.

THE COURT: On Mr. Smith's request that I should make the direction in regard to questions and answers 127 and 128 I do direct that questions and answers 127 and 128 be used because I think they are so connected with that part of the examination which has been used that the latter should not be used without the other. 20

MR. WOODS: Shall I read them or has Your Lordship read them?

THE COURT: I have read them.

"127. Q. You spoke of a hydro-static test. I would take that to be water? A. That was the test conducted at the factory.

"128. Q. When testing the steel itself? A. No. Testing the finished pipe. This twelve-inch pipe was all tested, or supposed to be tested, at the factory, to a pressure of 500 pounds."

"160. Q. Your counsel has very generously offered to tell us what inspection you actually made of those pipes. Will you be good enough to tell us, then, at least that? 30

WITNESS: You are referring to what line?

"161. Q. The intermediate pressure line in the lane South of Jasper Avenue, between 106th and 107th Streets, in the City of Edmonton? A. That was inspected on the 6th of February, 1932, by Jack Wild.

"162. Q. Who is he? A. One of our employees.

"163. Q. When it was inspected, what do you mean; what did he do? A. Well, he travelled the whole of the intermediate pressure line, from Number 4 station, to Number 5 Station, Number 4 being located as I said before.

"164. Q. He walked along the lane? A. And, where the line was not under pavement, he flashed the line.

"165. Q. What does that mean? A. He walked over it with a torch, carrying a torch over the top of the ground, over the pipe.

"166. Q. Over the top of the ground? A. He would carry a torch, with the flame over the ground, close to the pipe.

"167. Q. He is walking along, carrying a lighted torch? A. Yes.

"168. Q. Holding it close to the ground? A. Yes.

"169. Q. And he is walking along the line at this point? A. Yes.

10 "170. Q. And he is supposed, if he executes his duty, to be just above the low pressure main, is he? A. Yes.

"171. Q. And that was on the 6th of February, 1932? A. Yes.

"172. Q. How long did it take him to go from the fourth station to the fifth station? A. I don't know.

"173. Q. And there was snow on the ground? A. Yes."

MR. WOODS:

"263. Q. Do you identify your signature? A. That is a facsimile of my signature."

20 MR. WOODS: I will file this letter as this case may go further than our own Courts.

MR. SMITH: I am going to object now—I am going to raise the general objection that events subsequent to this fire may not be led in evidence against us—things we did afterwards — as a basis for negligence. I submit as far as Your Lordship is concerned you are bound by the C.P.R. case.

THE COURT: Bound as far as it goes. I supposed this letter was going in without objection?

MR. SMITH: Well we did object (reading).

30 MR. WOODS: This matter was gone into in an application that came before the Court before Mr. Justice Ewing and a written decision was given by him on this very matter, and referring to the C.P.R. and Toll case and holding against me on appeal from the Masters In Chambers. From time to time there was a direction in his judgment that if any difficulty arose as to subsequent questions they were to be brought back to him. And my friend and myself during the course of this examination did come back to Mr. Justice Ewing with respect to various matters as to whether they came under his ruling and he ruled upon the matters then and the examination then went on subject to his ruling and no appeal was taken from that. So it is a little late now to bring this
40 matter before Your Lordship.

*In the
Supreme
Court of
Alberta,*

No. 7

Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.
continued.

THE COURT: Well, Mr. Woods, he was ruling on the question of discovery. I have to rule on the question of admissibility of evidence at the trial.

MR. WOODS: Well that is the position and I would have thought the parties were bound if they litigated the matter down below.

THE COURT: I did not realize this letter was a subsequent letter—December, 1932.

MR. WOODS: It is a question of the steps taken to odorize the gas.

THE COURT: You say that my brother Ewing took the view against you? 10

MR. WOODS: No.

THE COURT: I would be inclined to agree with him if he did, that is as to the applicability of Toll & C.P.R. I will admit it subject to the objection. I think for the moment there is a great deal to be said for the objection apart altogether from any point of view that might be taken from an action different to Toll and the C.P.R.

MR. WOODS: I think Your Lordship will see later on.

THE COURT: Well it will be Exhibit 8 but subject to objection.

**Letter dated December 9, 1932, Julian Garrett to
"Our Customers" marked Exhibit 8.** 20

(Mr. Woods reads Exhibit 8.)

MR. WOODS (reading):

"264. Q. This is a circular letter, headed 'Personal Letter,' issued by your Company, signed by you as Manager, to your customers, dated December 9th, 1932? A. Yes.

"265. Q. You say in it that, early in 1932, you commenced experimenting to determine the feasibility of odorizing the Company's gas?

MR. MILNER: I object to any evidence as to what transpired after the 21st February, 1932.

"266. Q. MR. WOODS: When did you commence experimenting? 30
A. We commenced giving consideration to the matter of odorization about the 7th October, 1931.

"267. Q. And what consideration did you then give it? A. Well, we prepared three estimates of cost of odorizing, during the year 1932, and those estimates were submitted to Mr. Yorath, and we were instructed to include a certain amount for experimentation with odorizing in 1932.

"268. Q. Have you got those estimates? A. Yes.

"269. Q. Will you let me see them?

MR. MILNER: Subject to the objection that they are not relevant.

"270. Q. MR. WOODS: And what kind of odorization were those estimates based on? A. One estimate was for continuous odorization of the system; another estimate was for odorization for six days in the latter part of June and ten days in the first part of July, and after that continuous odorization for the balance of the year. The other estimate covered just odorization for ten days in the latter part of June, and six days in the first part of July.

10 "271. Q. And what sort of odorization was it; what was the odorant in it? A. The odorant we thought of at that time was cal-odorant.

"272. Q. And what is cal-odorant? A. I can't give you the chemical composition of it. It is a sulphur compound.—Just a minute. I'm not sure but that was ethyl mercaptan.

"273. Q. As early as 1931, then, you were considering the feasibility and advisability, from an economic standpoint of introducing ethyl mercaptan as an odorant into your system? A. We were considering the advisability and economic possibility of odorizing with some kind of odorant. Ethyl mercaptan was one of the odorants that were considered.

20 "274. Q. You yourself had a knowledge of the investigations into that subject by the United States Bureau of Mines, had you not? A. Yes.

"275. Q. And I am producing to you a paper on that subject, issued by the United States Bureau of Mines which you can perhaps identify?

MR. MILNER: We can't identify it. It purports to be a report issued by the Department of Mines.

"276. Q. MR. WOODS: You are quite familiar with these United States Bureau reports, Mr. Garrett? Can you identify this document as being what it purports to be? A. Yes.

30 "277. Q. Have you ever seen it before, or a copy of it, a similar thing? A. Yes.

"278. Q. And you have had it, and read it? A. Yes.

"279. Q. And you had it and read it at the time that you were considering the use of an odorant, in October, 1931? A. I hadn't read it at that time.

"280. Q. When did you read it; do you remember? A. I don't remember just when I did first read that article.

MR. MILNER: Mark it as an exhibit, subject to my objection." I tender this report.

40 MR. MILNER: I do not know about this. It is merely a report from the American Department of Mines. Whether they are an authority or not I do not know.

THE COURT: The only grounds upon which it is tendered or could be tendered at all is because of the suggestion that it might have been

*In the
Supreme
Court of
Alberta,*

—
No. 7

Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.
continued.

read before the fire. The answer is, "I had not read it at that time." On what principle do you suggest it is admissible?

MR. WOODS: As showing that at that time, the time they were considering this in October, 1931, that the fact of the odorization of the gas supply of this character was a well known fact and was a condition— It goes to the question of their negligence.

THE COURT: How do you suggest that a document issued by the United States Bureau of Mines, even if you proved it was—

MR. WOODS: Well Mr. Garrett identifies it as a report of the United States Bureau of Mines. 10

THE COURT: Is it going in without objection or subject to objection or do you want me to rule upon the objection?

MR. SMITH: No My Lord. The document is objected to. It was objected to on discovery and it is objected to here. It has not been proved and it is not relevant as far as I can see.

MR. WOODS: Mr. Garrett identifies it.

MR. SMITH: This was your question, reading from 281.

THE COURT: That was not read yet.

MR. WOODS: I will read 281 (reading) and 282 (reading).

"281. Q. This Exhibit 7 purports to be a report of investigations made by the United States Bureau of Mines, Department of Cost, Scott Turner, Director, with regard to the use of ethyl mercaptan to detect leaks in natural gas distribution system, which report was made in June, 1930? A. Yes. 20

"282. Q. And with which report you are familiar? A. Yes."

And Mr. Garrett identifies it as being what it purports to be. And the document itself, so identified upon being read, shows that certain conclusions are come to definitely by the investigation of the United States Bureau of Mines with regard to the odorization of natural gas and I say that is a state of the art which is known to be so as early as 30 June, 1930, and is important here in this Court.

THE COURT: Really I must confess my surprise. On what principle do you suggest that that as a document is admissible in this trial? I can quite understand the use of it that may be made by some experts later.

MR. WOODS: It shows the state the art had got to at the time.

THE COURT: The state of that and the opinion of the United States Department of Mines might be on something different to what will come out in this action.

MR. WOODS: I submit the document shows that at this time the matter had been considered by the Department of Mines of the United States and that the question of the use of an odorizing element in connection with this had been the subject of investigation and that certain conclusions had been come to with respect to it which Mr. Garrett knows to be a fact, and I submit it is evidence here in connection with the allegation we made that there should have been an odorizing element in the gas.

THE COURT: If the objection is persisted in I will give effect to it.

10 MR. SMITH: The document is most certainly objected to.

THE COURT: Then I will not admit it.

MR. WOODS: (Reading):

"293. Q. Did you make any recommendation at all, or did any officer of the Company make any recommendation about it, verbal or written?
A. My recollection is that the estimate—that I passed it on to Mr. Yorath, and he replied, instructing us to include in our estimates for 1932 an item covering six days odorization in June, and ten days in July.

20 "294. Q. Was that pursuant to your recommendation, that action of his? A. I don't recall whether I made a recommendation by letter or not, or whether I simply submitted it to him for his decision.

"295. Q. Have you got your letter submitting it? A. Yes.

"296. Q. Will you let me see it? There are letters between you and Mr. Yorath on the subject, are there? A. Yes. I think there is a memorandum dated October 7th, 1931 to him and his reply of October 8th.

"297. Q. 1931? A. 1931.

"298. Q. And is October 7th, 1931, the earliest date at which there is any reference to this matter of odorization, in any correspondence, reports or communications in the Company's possession? A. No.

30 "299. Q. It was examined into before? A. Well, Spencer was investigating it before October 7th.

"300. Q. The first conclusion in this report, Exhibit 7, is as follows: 'The odorization of natural gas with ethyl mercaptan was found to be a 'very good means for detecting leakage, and a much cheaper means than 'usually used for protection methods.' Is that the conclusion that you came to, as a result of looking into the matter?

MR. MILNER: Subject to my objection?

A. I agree with that.

40 "301. Q. MR. WOODS: And you had agreed with that at the time of the correspondence between you and Mr. Yorath? A. I hadn't given the matter very much personal consideration at that time, myself.

"302. Q. Had anybody in your Company? A. Mr. Spencer had."

"306. Q. Now you spoke also of considering this matter of odoriza-

*In the
Supreme
Court of
Alberta,*

No. 7
Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.
continued.

tion and investigating along the lines of considering cal odorant as an odorant? A. Yes.

"307. Q. Was that before the fire? A. I think so.

"308. Q. Do you get this publication "The Gas Age Record?" A. Yes.

"309. Q. You are familiar with it? A. Yes.

"310. Q. I am referring to the report of the Odorization Committee of the Pacific Coast Gas Association, in the issue of September 6th, 1930. You have read that? A. Yes, I have read that.

"311. Q. And you were familiar, then, with the possibility of odorizing the gas by cal odorant, before the fire? A. Yes." 10

MR. SMITH: I am taking the same objection to that report as to the other one, that anything admitted in evidence in this court house must be proved under oath.

THE COURT: I will admit it subject to objection. I think there is a difference between the other and Mr. Garrett's answer.

Page 341 "Gas Age Record," "Odorization of Natural Gas" Marked Exhibit 9.

MR. WOODS: (Reading):

"312. Q. What is it that you are odorizing with now?"

MR. SMITH: I take the position that I am objecting to any evidence of things done subsequent to the fire being admitted in evidence here. Your Lordship sees my difficulty. I am of the view that the Toll and C.P.R. Case makes that evidence admissible here, some of it in any event, but I am also of the opinion that Toll and C.P.R. is very bad law and we are bound by it. On the other hand, I must submit my objections here in order to attack Toll and C.P.R. 20

MR. WOODS: Mr. Milner did not make that objection before.

MR. SMITH: Well I am making it now, with all respect, and in order that I may take advantage of it later on.

THE COURT: I will allow it to go in subject to objection. That objection is different to the other one but of course you are taking both, naturally. 30

MR. SMITH: Yes.

MR. WOODS: (Reading):

"A. With a product supplied by the Imperial Oil Company from the Turner Valley Field. I don't know that they have given it a name yet.

"313. Q. It is neither ethyl mercaptan nor cal odorant? A. No.

"314. Q. It is equally as good as either of them, is it? A. We are not in a position to judge yet.

"315. Q. Well from the smell of it? A. I am inclined to think it is very effective."

"318. Q. MR. WOODS: This gas supplied to Edmonton you call 'sweet gas.' What does that mean? Is it odorless? A. It means gas in its natural state.

"319. Q. But how about the odor of it? A. And it is a gas that is free from sulphur content.

"320. Q. Has it got any odor? A. Yes. In concentrated quantities, you can smell it.

10 "321. Q. An ordinary escape, would you smell it, before odorant was put in? A. If the volume escaping was large enough to burn, I think you would get a whiff of it.

"322. Q. I have never smelled it at all. Is it distinct at all? A. Yes, very distinct.

"323. Q. That is, a large volume of it? A. Yes.

"324. Q. You could smell that there was something wrong? A. Yes.

"325. Q. And can you smell that there is something wrong out in the open air? A. Yes.

20 "326. Q. And when you speak of the concentration of it, do you mean concentration in a room? A. No.

"327. Q. In the particular locality it is? A. Yes. If you have an escape of gas in any quantity at all, you can smell it right above the ditch.

"328. Q. Just walking along that line? Suppose there was an escape of gas in considerable quantity, could the ordinary person walking along the line detect it? A. I don't know that the ordinary person would detect the smell of gas: it would seem to me that a man would have to be familiar with the particular odor of gas. A natural gas man, who has worked around escaping gas at all, would readily recognize the odor.

30 "329. Q. But is it generally itself much more odorless than for instance the Calgary gas? A. Yes.

"330. Q. And would you say that this gas that comes from the Viking Field is, speaking generally, a comparatively odorless gas; is that a proper description of it? A. Yes, I would think so.

"331. Q. What was the first word that anyone of the Company, yourself or anyone else so far as you know, got of that fire on the 21st February, 1932, at the Corona Hotel? A. I think Mr. Spencer was the first one that heard of it.

40 "332. Q. What time did he hear it? A. I would think about a quarter after nine; I don't remember exactly.

"333. Q. The fire started when? A. The fire call was at 9:11, I think.

"334. Q. And what have you learned that Mr. Spencer did? A. He 'phoned Mr. Philpot and Mr. Danes. I think Watson was called, and whether it was Danes that called Watson, or Spencer, I don't remember.

"335. Q. Who were those people? A. All employees of the Company. Danes is the City Superintendent, and Philpot is the man who generally responds to fire calls. They were called immediately after Mr. Spencer had notification.

"336. Q. And then you got there some time after, did you? A. He 'phoned me after he had called the other man, and I got there about a quarter to ten."

"355. Q. What had they done in the way of endeavoring to locate a gas leak, if anything, up to the time you got there, or subsequently to your getting there? What did the Gas Company's men do? A. Philpot 10 had been in the basement, and I think he tried to find the meter once and couldn't find it, and came out and asked someone, and was told where it was, and he went back and found it, and turned off the cock at the meter.

"356. Q. But I am speaking of their endeavors to locate a leak of gas. I am informed that there were holes made in the lane by the Gas Company's employees, right along up to the corner of 7th Street, at intervals, to see if they could determine a leak. Is that true? A. Later on in the evening, that was done.

"357. Q. About what time? A. Oh, I think that was after eleven 20 o'clock.

"358. Q. Just describe what was done, will you? A. They opened up one hole near the easterly boundary of 107th Street; they didn't finish that hole. Afterwards, they moved up from there to the curb box.

"359. Q. I think that we can shorten this, and make it more intelligible, by reference to this blueprint. I am not asking you to verify the tabulation of elevations on it as given in the table here, but I would like you otherwise to verify that as being correct. The twelve-inch gas main, and the ten-inch gas main, the street railway return cable, the wooden box, the two streets, and the position of the hotel, are shown. A. It 30 seems to me to be a fairly accurate plan.

(Blue print referred to put in and marked Exhibit 9.)

"360. Q. You spoke of the gas being turned off at the meter in the hotel. That was turned off at that meter shortly after the fire started? A. Yes.

"361. Q. What would be the effect of turning that gas off at the meter? That would mean that no gas would go into the hotel? A. It wouldn't pass beyond the meter, nor pass into the meter as a matter of fact. There would be only gas in the service pipe between the meter and the stop-cock, and when the stop-cock was closed there would be no gas 40 pass it—

"362. Q. Would you mind showing me, by reference to this plan, just where those efforts were made to locate a leak by the Gas Company's employees? A. I can't do it very accurately, but somewhere in here. (Indicating on Exhibit 9.)

"363. Q. We will put that Number 1. And then the next hole was dug about where? A. This doesn't show the entry of the service into the hotel. It was roughly in here somewhere. (Indicating.)

"364. Q. Mark that Number 2. (Witness marks.) Then was there another hole dug? I thought there were three or four along the main, before you came to the corner? A. There was one over here. (Indicating.)

"365. Q. That is, away at the West side of the street? A. Yes. We will call that Number 3.

10 "366. Q. Then was there any more before you actually made the one at the corner? A. No. I don't think so. There was the one here at the corner, marked 4.

"367. Q. At those other places where they dug holes to see if there were any leaks, there wasn't anything to show a leak? Am I right? There were no leaks discovered as a result of those holes being put down? A. At this point 1, when they dug through the conduit of the return cable of the street railway, they found there was gas in the box travelling in an easterly direction.

20 "368. Q. But there was no leak discovered in either one of the gas mains there? A. No.

"369. Q. But your men could notice gas travelling eastward along that box? A. Yes.

"370. Q. Then what did your men find in number 4? A. They found a leak at number 4.

"371. Q. Will you describe that leak to us? A. There was a weld at that point, and the weld had parted on the under side of the pipe.

"372. Q. How far; what was the extent of the break? A. About five inches.

30 "373. Q. I don't mean around the pipe, but the width of it. A. It would be only guessing on my part; I didn't examine it.

"374. Q. There was a break about five inches long, around the under side of the pipe? A. Yes.

"375. Q. And gas was escaping from that pipe? A. Yes.

"376. Q. And was that the gas that was going along the conduit? A. I would think so, yes.

"377. Q. The conduit is how close to that place where the leak was? A. It is just above it, and a little bit northerly. I would say that the bottom of the box was within a foot say of the top of the pipe.

40 "378. Q. And it was in the same trench? A. Well, you might say that it was in the same trench; it was right above it. It was laid at a different time to our main. The trenching from our main would be filled in again, and then they put the conduit in later.

"379. Q. It was in close proximity, and it was an easy method for the gas to escape from that break into that conduit? A. Yes.

"380. Q. And it was obviously doing so, and going down the lane East? A. Yes.

*In the
Supreme
Court of
Alberta*
—
No. 7
Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.
continued.

“381. Q. And was it escaping in large quantities? A. Yes, fairly large quantities.

“382. Q. It was under a pressure of forty-five pounds, was it? A. It would be probably nearer to thirty-five pounds; it might be anywhere from thirty-five to forty pounds.

“383. Q. And the box itself was an old box, wasn't it? A. Yes.

“384. Q. It was of such a character that— A. Yes; it had rotted out in places.

“385. Q. And the gas would easily get into it? A. Yes.

“386. Q. Were there any other indications of escaping gas that your men discovered that night, except that at that point Number 4, and in the duct that you have mentioned? A. It wasn't discovered that night; it wasn't discovered until the afternoon of the next day. 10

“387. Q. Am I right, then, from what you have told me, in saying that, that night, during the course of the fire, and after the fire was under control, while these holes were being dug, other than hole Number 4, there was no presence of gas discovered, or no leak discovered, except the presence of the gas in the duct in the return circuit that you have mentioned? A. The presence of gas in the conduit was not discovered at this point until early in the morning, Monday morning—that is, at Point 1. 20

“388. Q. At what time; do you remember? A. I don't remember just what time it was; I think it was around six or seven o'clock in the morning.

“389. Q. Up to that time, had the Gas Company employees discovered any leaks? A. No.”

Blueprint showing underground utilities, 107th Street and Lane, marked Exhibit 10.

“393. Q. Did you notice the flame burning on the outside wall of the building which was obviously a gas flame? A. I didn't notice anything that was obviously a gas flame. 30

“394. Q. Did you think it was a gas flame? A. No. I saw a flame that resembled the color of a good gas flame, around about one o'clock in the morning.

“395. Q. And where was that? A. Well, I saw it just East of the door to the kitchen.

“396. Q. On the outside wall? A. Between the pavement and the wall; and I saw it also in the rear of Motor Car Supplies.

“397. Q. How high was it? A. It was just flashes of little blue flame there.”

“399. Q. I mean, it occurred to you that it might be gas, at that time? A. Yes, it occurred to me that it might be gas. 40

“400. Q. And it was because of the fact that there was some gas escaping and being burned somewhere there that those efforts were be-

ing made by the Gas Company to locate the leak? A. Well, it seemed to be rumored around that it was a gas leak, and if it was, we wanted to find it.

“401. Q. But, apart from rumor, you could see that those rumors had some confirmation, because you could see gas flames coming up outside the wall? A. They certainly warranted investigation.

“402. Q. And it was because of that, that you investigated? A. Naturally.

10 “403. Q. And it was not until the following afternoon that you actually discovered the leak; is that right? A. I think it was around two or half-past two in the afternoon.

“404. Q. You continued your efforts to find it until you did find it? A. Yes. After we had found the gas at this point travelling in an easterly direction, we went to this point Number 3 and we got down to the conduit there, and we found the gas travelling in a westerly direction. Then we knew that the leak was somewhere between 1 and 3, and we took a shot at approximately half way between, and we hit it.”

MR. MILNER: I would ask you to read question 398.

MR. WOODS: It does not explain the matter at all.

20 MR. MILNER: It should be read, I submit. You will notice the form in which Mr. Woods puts the question.

MR. WOODS: I did not read it because I did not think it added to the information.

MR. MILNER: You will notice the way in which Mr. Woods frames his question 401. In view of that I ask again that you read it.

THE COURT: I will have to read it to see if I can read it.

MR. MILNER: Yes, sir.

THE COURT: Oh I do not think it is so connected with or comes within Rule 250.

30 MR. WOODS: (Reading):

“421. Q. It is so, is it not, that the back of the hotel building came right to the lane? A. Yes.

“422. Q. And there would be a distance between the back of that building and the box of what, roughly? A. Two or three feet, I guess.

“423. Q. And the soil in that two or three feet was loose soil, wasn't it? I mean, it wasn't rock; it wasn't impervious rock? A. No.”

40 “438. Q. And the testing of the welding. Are the only reports these daily reports such as you have produced here; is that the only kind of report about this installation that you can find? A. I haven't been able to find a report on the testing of the welds.”

"441. Q. By the way, 107th Street was paved at that time, was it?
A. Yes.

"442. Q. But the lane was not paved? A. No."

"460. Q. The pipe was what; twenty-foot pipe? A. They would
average about twenty.

"461. Q. And there were four lengths of it across the street?
A. Yes.

"462. Q. And in the centre of the street was the place where this
weld was that was found to be broken; two of those pipes had been weld-
ed together? A. Yes." 10

"467. Q. I mean, did you get any information from any source as to
whether, at the place where this weld was, and where this break was, that
pipe was laying, and had been laid, on virgin soil, or anything to indicate
to you that, when it was laid, it was laid and then it rested on filled-in
ground, either by the presence of wood or brick or anything else? A. Oh,
I think there must have been some back-fill went under the pipe; I don't
know.

"468. Q. You know that there was alien substance, like brick and
wood, in there? A. Well, I have already said that I didn't know how
that got in there. 20

"469. Q. Well, their presence there would indicate that it was not
virgin soil; that is true, isn't it?"

"491. Q. When this break was discovered, which I gather was the
afternoon of the day following the fire, what was done by the company?
A. They put a Dresser split sleeve over it.

"492. Q. A Dresser coupling, is it? A. Yes.

"493. Q. And left the pipe in that condition? A. Yes.

"494. Q. And filled in the trench? A. Yes.

"495. Q. And you had to take up some pavement in order to do that,
did you? A. Yes, we had to break some pavement to get down to it. 30

"496. Q. And that is the way it remained until when? A. Until
June."

At 12:30 Court adjourns till 2:00 p.m.

At 2:00 p.m. Court resumes.

MR. WOODS (reading):

"499. Q. MR. WOODS: Was there any indication, at or near the
point of this fracture, of there being any abnormal pressure on the ex-
terior of that pipe, when your men discovered it? Was there anything
resting on it, or any abnormal pressure on it, that would cause it to sag
or break? A. No, I don't think so. I wasn't present myself. 40

"500. Q. And was there any evidence of depression or sagging in the
pipe line from its original level? A. It appeared to have settled.

"501. Q. To what extent? A. Possibly six to six and a half inches.

"502. Q. From the level? A. Yes.

"503. Q. Between the two sides of the street? Mr. Garrett, if you will take a pencil and show me where the six and a half inches below the level were? Was it at a proper level at each side of the street, and then a dip between those two points? A. I think, for the whole length of the pipe, they had to close the gaps. I think that they put a block there, and raised the pipe until the gap closed, and they had to raise the pipe six and a half inches to close the gap."

10 "505. Q. Well, I am referring to Exhibit 9. Here is this pipe coming to the property line on the West side of 107th Street. Now was the pipe at the proper level there, and was the pipe at the proper level on the East side of 107th Street, and was the six-inch depression between those two points? A. Yes, I think so."

"512. Q. Was there an expansive joint in this coupling at the centre of 107th Street? A. It was a rigid joint at the centre of the street, but there was a Dresser coupling on each side.

"513. Q. Where the pipe was joined on the East side of the street, and also the West side of the street, there were Dresser couplings?

20 A. Yes.

"514. Q. And that would leave a certain amount of play? A. Yes.

"515. Q. But in the centre, where this welded joint that broke was, there was no Dresser coupling, and it was a rigid pipe? A. Yes.

"516. Q. What was the distance between the Dresser couplings? About eighty feet? A. About eighty feet.

"517. Q. Is that the ordinary distance between Dresser couplings on your system, in the intermediate pressure lines? A. Where we cross the streets, that is about the distance.

30 "518. Q. And where you don't cross a street, do you have Dresser couplings all the way along? A. Yes.

"519. Q. And what is the distance between them? A. About twenty feet.

"520. Q. Ordinarily you join your pipes together with Dresser couplings? A. Yes.

"521. Q. And it is only where you cross a street that the distance is ordinarily greater? A. Yes.

"522. Q. And that means where you cross a paved street, I suppose? A. Yes."

40 "524. Q. And that is the case also in connection with your low pressure system; it is a Dresser coupling system? A. Yes."

"535. Q. Have you any temperature measurements—that is, of the temperature of the gas in the mains? A. Temperature readings have been taken, yes.

*In the
Supreme
Court of
Alberta,*

—
No. 7
Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.
continued.

"536. Q. I mean for about this time, February, 1932. What was the temperature of the gas in the mains? A. It would probably be around twenty-five degrees."

"583. Q. And you were to produce the report that Wild made at that time. Have you got it? A. Yes (producing).

(Report referred to put in and marked Exhibit 14.)

Report "Flashing Intermediate Lines," February 6th, 1932, marked Exhibit 11.

"584. Q. Now it says at the bottom: 'No flashing was done where the lanes are paved over.' And this lane between 6th and 7th Streets, South of Jasper, at the rear of the Corona Hotel, was paved on the 6th of 10
February, 1932? A. Yes.

"585. Q. So that he did no flashing at that point at all, according to his report? A. According to his report. He wouldn't do any flashing there. As I said before, he would smell at the man-holes."

"587. Q. Well, is there any other inspection than that? The two things that he did, as I gather, was flashing the line and smelling at the man-hole, and he certainly didn't flash this portion of the line, so therefore all he did was smell at the man-hole. Am I right? A. Smell at the man-hole, and walk over the line.

"588. Q. His inspection walking over the line—if the line is three 20
feet underground, he is doing nothing to test the line in walking over it, is he? A. No."

"590. Q. Now what inspection was made, if any, of that line, before the 6th of February? A. There was another inspection made on September 22nd, 1931.

"591. Q. And what was the character of that inspection? A. It was a similar inspection.

"592. Q. And again it was Wild, was it? A. Yes.

"593. Q. And have you got his report of that? A. Yes (producing).

(Report referred to put in and marked Exhibit 15). 30

Report "Fire Testing Intermediate Lines," September 22, 1931, marked Exhibit 12.

"595. Q. And, so far as you can gather from this, or can give me information now, it was of the same character as the one you have just described? A. Yes."

"597. Q. And what was the one before that again? A. March 3rd, 1931.

"598. Q. And is it of a similar character? A. Yes.

"599. Q. So far as this particular portion is concerned, it is simply his flashing of the intermediate line from Number 4 to Number 5, and that the lines under the pavement are not flashed? A. Yes." 40

"614. Q. You were to let me have those estimates on odorization?
A. This is Mr. Spencer's estimate, dated October 7th, 1931, which I referred to previously (producing).

"615. Q. This is on the three different bases? A. Yes."

Memo re Odorization and Three Letters marked Exhibit 13.

"636. Q. Do you know what Mr. Spencer did in the way of investigating before October 7th? A. Well, he had obtained certain literature, I know, which he had read.

10 "637. Q. What was it; do you know what literature it was? A. You produced one pamphlet which I am pretty sure he had at the time.

"638. Q. That is, that one of the United States Bureau of Mines, about ethyl-mercaptan? A. Yes."

I again tender that. It is not proof of its contents but it is useful as showing the state of the art at that time, that there had been investigations—that it is a report of a bureau recognized throughout the American continent, I suggest that it properly should be before the Court for the purpose of dealing with the matter.

THE COURT: Does this answer alter your position?

MR. SMITH: Not in the least, my Lord.

20 MR. WOODS: When the report is before these officers in studying the question—

THE COURT: That fact is apparent from the answers. The document itself, though, in my view is not admissible.

MR. WOODS: (Reading):

"672. Q. The air pressure was what? A. On February 20th, 27.47 inches of mercury; on February 21st, 27.862; on February 22nd, 27.566. That is the mean barometer on those dates.

30 "673. Q. And the temperatures? A. The temperatures were: On February 20th, the maximum 5, the minimum —4, the mean not quite 5; February 21st, the maximum 6, the minimum —22, the mean —8.0.

"674. Q. That is the temperature of degrees in frost, or below? A. That is —22 Fahrenheit, 22 degrees below zero.

"675. Q. That was the lowest point on the 21st of February, was it? A. Yes.

"676. Q. It was a pretty cold day? A. Yes."

"706. Q. By the way, the stop-cock on the lane, at the Corona Hotel property there, at the point 2, is in the lane, and not on the Corona Hotel property; it is on the lane side of the property line? A. Yes.

"707. Q. It is under the control of the Company? A. Yes.

40 "708. Q. You told me of the break in the twelve-inch main, at the

*In the
Supreme
Court of
Alberta,*

—
No. 7

Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.
continued.

weld, where the pipe crosses 107th Street. Do you know of anything other than the settling of the pipe that would cause that pipe to break? You remember you told me of the break, and of the fact that the pipe had settled, between the two sides of the street, as I remember about six inches. Do you know of anything, other than that settling, that would cause that pipe to break? A. I would think the settlement would be the most probable cause."

"741. Q. Did any of the employees of the Company take any other steps, on the night of the fire, to find if there were any gas leaks in that vicinity, other than digging the holes, 1, 2, 3 and 4? A. Yes; I think 10 some of the curb-boxes along the lane were tested.

"742. Q. Were tested that night? A. Yes.

"743. Q. With what result; do you know? A. There was no leakage of gas found.

"744. Q. From the curb-boxes? A. No."

"767. Q. Does any other person or Company that you know of, other than your own Company, deliver gas to consumers in Edmonton? A. No. There is some gas used by the City which is a product of their sewerage disposal plant.

"768. Q. What is that; where do they use that gas? A. I think they 20 use some of it right at the sewerage disposal plant.

"769. Q. But there is nobody else that delivers gas to consumers in the city? A. No one that sells gas, no.

"770. Q. Or gives it away? Any gas that would be in the basement of the Corona Hotel, on the night of the 21st February, 1932, if there was any gas there, and it was natural gas, would be gas which somehow or other came through your pipes? A. Yes."

"802. Q. How far was that City manhole from the break marked '4' on the plan? A. About four feet, I think—three and a half or four feet. 30

"803. Q. Now did any gas—according to your information that you could get, likely escape into that manhole from that break? A. I don't know as to that.

"804. Q. Well, from your previous answers, I would take it that you wouldn't think it did, because the ground was frozen. Am I right? A. It might have gone in there."

"807. Q. Would the frozen ground prevent it getting into the manhole "A"? A. It might have gone in there.

"808. Q. Do you think that it is likely it did? A. I don't know.

"809. Q. Have you any idea on the subject? A. It is possible that it 40 might have gone in there. I don't know.

"810. Q. So it might go four feet through the frozen ground, then? A. I don't think it is quite four feet from the break in the main to the outside wall of the manhole.

"811. Q. Well, how far is it? A. I don't know exactly. It might be about two feet—a foot and a half or two feet.

"812. Q. To get into the manhole, it would have to go through the wall, wouldn't it? A. Yes.

"813. Q. My understanding of your answer is that it is quite possible that that gas went from the point where it broke, at the point we know of, into that manhole? A. I say it is possible."

10 "930. Q. And you have asked your employees, have you, as to that? You remember I asked you to ask what they knew about that? A. You asked me to ascertain if any of the employees discovered or saw a blue flame in the lane.

"931. Q. Yes, a similar kind of blue flame to the kind that you gave evidence of? A. I asked them that question, and Philpot stated that he saw a blue flame near the back door at 9:23 p.m. on February 21st."

"972. Q. In the early part of your examination, you gave me the information that your pipe was to be thirty-six inches below the ultimate street grade. Was that depth of thirty-six inches to the top, or to the bottom, of the pipe? A. To the bottom.

20 "973. Q. And the pipe was of what diameter? A. Twelve and a half inches. You are referring to the outside diameter?

"974. Q. Yes. A. No—it was twelve inches outside diameter."

"990. Q. What I would like to know is what he did about smelling at the manhole. Did he go into it; did he take the top off; what did he do when he smelled at the manhole? A. He didn't take the cover off; and he didn't go into it, naturally, if he didn't take the cover off. He merely kneeled down and smelled at the holes in the cover of the manholes.

"991. Q. On the 6th February, 1931, he knelt down on 107th Street and smelled at the cover of the manhole? A. On the 6th February, 1932.

30 "992. Q. And that is all the inspection that the Company made of this intermediate pressure line, at this point? A. Except to patrol the line.

"993. Q. To walk over the pavement, without flashing it, and without making any further inspection of it? A. Yes."

40 "1040. Q. MR. WOODS: What did you find? A. Well I telephoned Mr. Haddow, and he told me that the records of the 1923 paving had been destroyed, but that he had questioned Harry Hoffman, who was foreman of the paving in 1923, and that he had given him a memorandum, and in that memorandum he stated that it was his recollection that three holes were dug in 107th Street and tunnels were made between them."

MR. MILNER: That is not an admission by the Company, my Lord. You will notice up above that "That is not the Company's information; that is the City's information."

THE COURT: As far as the question and the answer goes it simply states what information your officer had.

MR. MILNER: What he obtained, sir.

THE COURT: It states he obtained certain information.

MR. MILNER: During the course of the examination he asks the City Engineer and that would not be the information of the company.

MR. WOODS: (Reading 1041).

"1041. Q. And that is all the information you have about it, up to the present time at all events? A. Yes."

MR. SMITH: In the first place it is purely hearsay evidence and 10 quite inadmissible in this Court in this form.

THE COURT: I think the answer can be taken only to the extent that it goes. It certainly does not prove the truth of the fact reported. And on its face it does not go so far as to say that the foreman, Mr. Hoffman had any definite recollection which would prove the fact you seem to object to. My remark to Mr. Milner was intended to mean that the answer must go in for what it stands. If Mr. Woods wants to read it as he has done I can't prevent his doing it.

MR. WOODS: In order to be sure we will endeavor to exhaust the 20 subject by our evidence-in-chief.

THE COURT: Well he does not go any further than to say that he wrote Mr. Haddow and got a letter from him, or I should not have said letter, but he was informed.

MR. WOODS: Yes, my Lord. (Reading 1045):

"1045. Q. And did you get the times, as near as possible, when the three holes were dug? A. Yes. Hole number 1 was started approximately at 11:40 p.m. February 21st, 1932, hole number 2 at 1:10 a.m. February 22nd, and number 3 at 9:45 a.m. February 22nd, and number 4 at 11:00 a.m. February 22nd." 30

MR. SMITH: I am suggesting to my friend, and I am sure he will agree, that he should read the question before that to show it is the same information coming from the City Engineer's Department.

MR. WOODS: Oh no, we are not at the same holes. The holes this question refer to are the holes made by the Gas Company at the time of the fire.

MR. SMITH: Oh I beg your pardon.

MR. WOODS (reading):

"1050. Q. Did you find whether the company had ever flashed man-holes? A. No, I don't think they have."

"1053. Q. Well, put it this way: If there was an escape of gas from the low pressure system serving the Corona Hotel, it would show in the curb-box? A. If there was gas escaping along the service into the Corona Hotel, it would be apt to show at that curb-box, yes."

"1057. Q. Yes, but what I want to get at is whether there was any indication of escape of gas from that low pressure system discovered by the men there? A. No, I am quite sure there wasn't."

10 1059 to 1061 inclusive.

MR. SMITH: I think I should now object to this evidence going in. What is sought to be done is to give a record of other leaks of gas in this distribution system and my friend has not yet suggested on what ground they can possibly be relevant. I take it, if I am correct, that he seeks to bring it in under his general allegation of a nuisance. The point I have in my mind is this, that we are not here, we cannot be here, to answer what might be eight or ten other separate lawsuits at this time or what at least might be the ground for eight or ten other lawsuits, at this time, and my friend's undertaking, it seems to me, does not need to go so far as to show that we have been bad at other times, but to show that we have been negligent on this occasion. I can give you no authority from this province but I know of two cases in which I was involved where the question was the design of harvesting machinery. Mr. Justice Tweedie refused to permit evidence in regard to other machines even where the breaks in those machines were in the same parts. And recently in a case at Calgary Mr. Justice Boyle did admit such evidence. There is one case reported of Mr. Justice Walsh where he did, but he did so by agreement. So that is all the authority Your Lordship will find here on the point. But what I do say is I know of no rule or reason why other instances of negligence, if that is what it is intended to show, can be used when they seek to find us guilty of one particular item. There is no rule with respect to similar acts or anything like that that can have any application—no question of habit or anything of that sort, and it is something which Your Lordship may determine right now and I think this is the proper place to raise it. We do object to evidence being given of any other leak. If Your Lordship holds that I am wrong then it does seem to me that my friend must be confined to leakages in our system through a broken weld, and there are a dozen ways in which gas may escape. It is one of these elements which in spite of the best precautions will escape at times. It is anxious to get loose at all times. But if I am wrong in my general statement I submit, with respect, that no evidence can be introduced except for other broken welds. I know there are no others so I am perfectly safe in resting myself in that position. That is the position I take. I have some authorities and if you think the

*In the
Supreme
Court of
Alberta,*

—
No. 7
Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.
continued.

thing is worth arguing Mr. Martland will give you the authorities. But without arguing it I put it upon the general basis I have given you just now.

THE COURT: Wasn't this matter canvassed on the question that went to the Appellate Division about the pleadings?

MR. WOODS: Yes, it was. It came up there and then the pleading was amended in the form that Your Lordship now has it in order to, as I understand the thing—

THE COURT: There was an appeal from me wasn't there?

MR. WOODS: Yes, and the statement of claim as it stood originally 10
and as Your Lordship will see from the Appeal Book 7a (reading). Now
that was objected to before Your Lordship and then an appeal was
taken to the Court of Appeal. Now I cannot get my memory of the argu-
ment, correctly, but I know this, that as a result of that argument the
amendment was made in the form that it now is, as 7a. The Court told
me in effect "well you should plead it is a public nuisance and that the
parties are specially damaged." So I struck out that plea and pleaded
(reading). Now that is the fact that there were—this is a pipe line
built as we have it in 1923. Its life is a certain time. Not only is the
evidence relevant to that issue directly on the record but it is relevant 20
also from this standpoint apart from that issue, that it shows that the de-
fendants were under a higher duty to take care—they had a warning,
in other words, during the year before this—ample warning that there
were escapes and blow-ups in the gas mains and repairs were neces-
sary. I have a letter here from Mr. Blanchard, counsel for the plaintiff
in the case of Reid against the City of Medicine Hat which was tried
before Mr. Justice Ewing. And that question came up on examination for
discovery and before the Chief Justice of this Trial Division in Chambers,
I gather. He says "precisely the same question came up"—he was speak-
ing of Mr. Justice Ewing's judgment. Mr. Blanchard said "the officer 30
selected by the City refused to answer questions put by me as to the de-
fective mains." And there was no plea in this case of the character
which is here which in itself raises the question direct.

THE COURT: Perhaps you can tell me what a public nuisance is and what the liability for such a nuisance may give rise to?

MR. WOODS: My idea is a nuisance which is so wide spread as to affect such members of the public as in the opinion of the Court makes it a public nuisance.

THE COURT: So far as this action is concerned giving rise to what liability? 40

MR. WOODS: Well if that is a nuisance of that character and if that nuisance especially affects the plaintiffs they are entitled to recover.

THE COURT: Without any causal relation between the actual occurrence and the public nuisance?

MR. WOODS: Well I do not think I would go that far. But certainly this matter was thrashed out along that line in the Court of Appeal and that is the reason for the plea on the record in the form that it is. There is that allegation there and it has not been struck out. My friend
10 did not move against that after the statement of claim was amended.

MR. SMITH: We had no objection to it.

MR. WOODS: But take the fact even apart from that, it, as I say, would carry the evidence to an issue on the record.

THE COURT: What you say is "and by recent maintenance of such a public nuisance before the fire herein referred to occurred." I assume you do agree there must be that causal relation?

MR. WOODS: Yes, My Lord.

THE COURT: Does it advance you any to make that allegation?

MR. WOODS: Yes, it advances me considerably both from the stand-
20 point of the allegation of public nuisance, but what I am very interested in is this: You have and you produce evidence in connection with a gas pipe line system put down in 1923 and this is 1932 and you will have other evidence come along to show what notice the company had in respect to that particular point, and assuming that, whether from a number of places or broken welds or broken threads or a number of different causes—my submission to the Court is this that that gives the Gas Company warning and they have to look out especially if they have some reason to know that this particular place at 107th Street and the lane is
30 a spot to look out for, and in my estimation I submit it is important to show the duty of the Gas Company to my clients. This gas came out at this particular place and there will be evidence to show that that is not the only time it came out there.

THE COURT: What did the Appeal Court do with respect to that paragraph 7? I did not strike it out because of some such argument as you are now advancing.

MR. WOODS: No, I do not think it was because of any argument along the lines that the City had warning. It was because of a decision or a statement which I thought was adequate to the effect that if there had been a number of instances—a series of disasters—then the jury
40 might find negligence. Well there was no written judgment. Mr. Fried-

*In the
Supreme
Court of
Alberta,*

No. 7
Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.
continued.

*In the
Supreme
Court of
Alberta*
—
No. 7
Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.
continued.

man reminds me it was on the ground that I was pleading evidence. I remember now it was because they said "that paragraph pleads evidence and it is improper on that account." But I remember during the course of the argument it being suggested to me "well why don't you plead a public nuisance" and then I so plead. But I am asking that that be allowed. I wish to get before the Court that there was a higher duty cast upon the defendant. There had been a warning thrown upon the Gas Company a year before.

MR. SMITH: On the facts, Mr. Blanchard's letter makes quite plain that there in house services there was apparently a number of things wrong which caused the City of Medicine Hat which owns the gas to look into its services. I said at the beginning that if I was wrong in a general proposition we must confine ourselves to a broken weld. But I do not want any confusion to arise in connection with what Mr. Blanchard said in that connection. 10

MR. MARTLAND: I am submitting it is not admissible evidence because in the first place it does not advance the plaintiff's case. Even though the plaintiffs do prove a series of breaks it is still essential to show that there was a leak from this particular break which caused the damage complained of. I submit that by proving a series of other occurrences at other places the present case is not assisted in the slightest. On the other hand we are put in the position of defending a dozen different lawsuits instead of one. Each explosion would have to be considered and the place of the break. One of the cases I remember mentioned was the Archer case you will remember that took a long time to consider. And in the second place I am submitting— 20

THE COURT: In other words, you suggest there might be a great difference between the break in the line and the defect.

MR. MARTLAND: And I submit that our gas system in this City cannot be considered to be a public nuisance since it was laid pursuant to statutory authority and I would recall to Your Lordship's mind the long series of cases which established that where a gas or water system is laid pursuant to a statutory authority that the owner of that system can only be rendered liable for an escape if negligence is proved and that the statutory authority constitutes a defence. As I understand it, my friend will probably contend that although we had statutory authority here we were still subject to Section 13 of the Water, Gas, Electric & Telephone Companies Act, which provides that pipes and mains shall be located so as not to endanger public health and safety. In answer to that I am going to submit that the defendant in the present case is not governed by that provision of the statute and for this reason the defendant's system was constructed in the year 1923. Your Lordship will notice that the Act in question was only made applicable to Dominion Com- 30 40

panies by an amendment enacted in the year 1924. At that time the defendant's system had been constructed and I am submitting, with respect My Lord, that the obvious intention of the Act was to make that section applicable only to companies that were working systems pursuant to its terms. In the present instance the defendant's system had been constructed and completed before the provisions of the Water, Gas, Electric & Telephone Companies Act were made applicable to it and I think he must admit that Section 13 cannot properly apply to the maintenance and construction of the system in this case.

10 THE COURT: What is the 1924 amendment?

MR. MARTLAND: That is in Section 23, Chapter 21, My Lord. But perhaps I had better read Section 2 (reading): I am submitting further that even if you should rule against us and hold that Section 13 of the Water, Gas, Electric & Telephone Companies Act does apply that even under those circumstances the plaintiffs are not warranted in bringing evidence merely of a series of leaks or breaks without relating them up in order to show that they are evidence of a faulty system of construction, a faulty method. I would submit that the meaning of Section 13 of the Water, Gas, Electric & Telephone Act is not to compel the Gas Company to construct a leak proof system. That is impossible; that the company is merely bound to use methods of construction and methods of location which shall not endanger the public health or safety and that in order to establish a violation of that provision the plaintiff must go much further than to show merely that leaks occurred. It must show that those leaks indicate a faulty system or a faulty method of construction. Now in that respect I should like to refer briefly to the Midwood case which my friend Mr. Woods relied on in the argument before Your Lordship with respect to striking out paragraph 7a. He relied on a quotation from the judgment of the Master of the Rolls: "Of course there might be such a series of mischiefs arising out of a particular system of electric lighting as to lead to the presumption that the very existence of the system itself involved such risk of mischief to the community as to constitute it a nuisance apart from the particular mischief happening in a particular case to an individual."

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Now in that case one of the issues which arose was as to whether the defendant's system of electric lighting, the method of construction, was or was not a proper system. And when the words of the judgment are read, with that fact in view, Your Lordship will note that when the Master of the Rolls refers to a particular system of electric lighting he is referring to a particular method, a series of proved mischiefs arising out of a particular system, and I would submit therefore that that case does not advance the plaintiffs in the slightest; that he must relate up any series of leaks proved in order to show a faulty method of location and construction and that he does not. He cannot merely read in portions of the examin-

40

*In the
Supreme
Court of
Alberta,*

No. 7

Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.
continued.

ation for discovery to show that certain leaks occurred unless he is also prepared to go further and to show that those leaks are being used as evidence of a particular faulty method.

THE COURT: What do you say as to admissibility on the ground that it might indicate a warning?

MR. MARTLAND: I submit that does not advance the plaintiffs in any degree. The company is aware when it constructs a natural gas system of the possibility of leaks. I would submit that the mere fact that certain leaks had occurred does not of necessity show that it was in a faulty condition, that any reasonable system of inspection is necessary and as Mr. Smith has pointed out the series of leaks here are not a series of leaks in welds from the intermediate pressure main. They are not related up in any way to the question of inspection of our intermediate pressure line, and I would submit that the argument raised on the basis of Reed vs. the City of Medicine Hat is not applicable here. 10

THE COURT: What do you suggest if there is such a series, as is suggested, that negligence might be implied? I understand Mr. Woods suggests that possibility. Or do you Mr. Woods?

MR. WOODS: I say it is one factor for the Court to take into account along with the other facts. 20

MR. MILNER: On what issue?

MR. WOODS: On the issue of negligence.

THE COURT: How can it be said that even if you proved the public nuisance that you allege and a fire was caused by the maintenance of that public nuisance—because that is what your pleading is—is there any other plea that you suggest that this is admissible under?

MR. WOODS: On the general plea that these people were negligent. The fact is these questions are answered—this matter was taken up and we went before Mr. Justice Ewing and the explanation about that, such as it is, Mr. Garrett gives. He states what these things are and how they were caused and that evidence is accepted. There is no question of any matter about going into big trials. I do not intend to do any such thing. I accept the statement of Mr. Garrett. 30

THE COURT: Is that as far as you intend to go?

MR. WOODS: There will be a number of questions later on.

THE COURT: So you are not intending to lead any other evidence than the answers given?

MR. WOODS: Yes.

THE COURT: Well if you will tell me what you intend to read I will read them over tonight and let you know.

MR. WOODS: 1059, 1060, 1061; 1072, 1073 to 1078; 1084.

THE COURT: I have to read them in order to see whether I can let you read them?

MR. WOODS: Yes.

THE COURT: I suppose that is so, Mr. Smith?

MR. SMITH: Yes.

THE COURT: Well you might as well read them, I am not allowing
10 them in at present. (Mr. Woods reads questions and answers indicated above):

"1059. Q. At question 240 on your examination, Mr. Garrett I was asking you about the breaks in the mains or the service of the company, and in question 239 I asked you if you kept a record of the various breaks that you have in your distribution system tht you have to attend to, and your answer was: 'We have an individual record of each instance, but we don't keep a register of them,' and in question 240 I asked you this: 'Do you keep them all in one place? Could you readily give me your record, for instance, of breaks in mains, say over a period of a year before
20 the fire?' and that was objected to and is now directed to be answered. Can you give me that record? A. Yes.

"1060 Q. Will you do so, please. If it is easier for you to give it to me in a copy of it or in a written form that will do. 'Do you keep a record of the various breaks in your distribution system all in one place? A. Yes, since January 1st, 1931.

"1061. Q. Will you give me a record of breaks in mains, say, over a period of a year before the fire? A. There were three. The first was repaired on December 2nd, 1931, and consisted of a pull in a 4-inch long Dresser coupling in the rear of 10188-92nd Street. The work on the sec-
30 ond was started on January 24th, 1932, and completed on January 25th, 1932. It consisted of a break in a 1-inch nipple at a coupling on our intermediate pressure main opposite 9361 Scona Road. The third one was repaired on January 29th, 1932, and consisted of two breaks on a 4-inch main on the bridge at Saskatchewan Drive between 105th and 106th Streets.

"1072. Q. Yes. Well, 'can you get me a record of ignitions, fires or explosions through escaping gas?' A. Yes.

"1073. Q. MR. MILNER: You had better read the answer. A. Records of all such information were destroyed when we moved our offices
40 from Jasper Avenue to 104th Street on July 31st, 1930. A complete record since January 1st, 1930, and including the occurrence on August 23rd, 1929, is as follows: (1) Rear of 10128-105th Avenue—August 23rd, 1929.

*In the
Supreme
Court of
Alberta,*

—
No. 7
Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.
continued.

*In the
Supreme
Court of
Alberta*

No. 7

Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.
continued.

This leak and resulting fire was caused by a broken nipple thread at a 3-inch coupling on the service and was on fire at the curb-box. It was repaired by installing a new coupling and nipple. When our men arrived the fire had been extinguished by the Fire Department. This service was installed in July, 1924. (2) 9324-101A Avenue—February 30th, 1930. This was the residence of O. L. Archer. Our 8-inch main pulled at a Dresser coupling. It was repaired by installing a long Dresser sleeve. This disturbance was caused by the slipping of the hillside.

"1074. Q. MR. WOODS: Well, that Archer one, that had a lot of damage, there was a lawsuit about that after? A. Yes. 10

"1075. Q. Do you remember whether there was a considerable explosion and conflagration as a result of that break? A. Yes, there was considerable explosion.

"1076. Q. Well, how much? I don't know about it. Was Archer's house blown up or what happened? A. Yes, it was damaged.

"1077. Q. Did it blow down? A. It blew out.

MR. MILNER: It blew every way.

"1078 Q. MR. WOODS: It blew every way, did it? A. It blew out."

"1084. Q. Now, the next one. A. (3) 12312-104th Avenue—February 20th, 1930. This was caused by a broken thread at the street all on the service connection to the main, and was repaired by replacing the damaged ell. Gas from this fracture followed the service pipe into the garage and an explosion occurred when Mr. W. C. Bradburn lit a cigarette on entering the garage. This service was installed in July, 1923." 20

"1091. Q. The gas followed along after it got at that point just where the service main meets the gas distribution system, there was a break in the thread and the result of it was there was an escape of gas that followed along the service main and entered the garage? A. Yes.

"1092. Q. And it made a fire in the garage? A. Yes. 30

"1093. Q. Burned up the garage, did it? A. No. I think the fire was quickly put out.

"1094. Q. There was an explosion which damaged Mr. Bradburn whether seriously or not? It did damage Mr. Bradburn? A. Yes.

"1095. Q. And it damaged his garage to some extent? A. I don't know to what extent.

"1096. Q. There was a fire anyway? A. Yes.

"1097. Q. The next? A. (4) Rear of 9841-104th Street—March 25th, 1930. This was caused by a broken thread on the inlet side of the service cock. This was repaired by inserting a Dresser sleeve. Our records do not show how the gas was ignited. The service was installed in October, 1928." 40

"1100. Q. The next one. A. (5) 11809-102nd Avenue—November

21st, 1930. This was caused by a broken service cock and was repaired by installing a new one. Fire was caused by one of our men who was testing for a leak with a lighted match. This service was installed in July, 1923."

*In the
Supreme
Court of
Alberta,*

No. 7

Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.
continued.

"1103. Q. Go on. A. (6) 10232-109th Street — September 26th, 1931. This was the residence of A. J. McAarty, which was damaged by a gas explosion caused by a break in the threads of the service cock. This service was installed in September, 1925.

"1104. Q. Was there much damage to McAarty's house? A. Yes.

10 "1105. Q. And to him, any personal damage? A. Yes.

"1106. Q. How much, do you know. What records have you? A. He and Mrs. McAarty were injured, laid up for a considerable period.

"1107. Q. House burn up? A. Yes.

"1108. Q. Was his house served with gas? A. Yes.

20 "1109. Q. It was from the service cock out in the lane behind, or in front? A. In front of the house. The service cock failed and there had been an excavation made there recently right under our service line; it went down to the water service at that point and the ground was refilled and there was no foundation in the house to support the service pipe. The settlement of the earth caused some disturbance.

"1110. Q. This was in your own distribution system when you speak of a break of a service cock it is in your own property? A. Yes, it is just on the outside.

"1111. Q. Go on with the next one. A. (7) 9158 Jasper Avenue—February 14th, 1932. These premises were owned and occupied by the Empire Marble and Tile Co. Ltd. An explosion was caused by gas leaking from a broken thread on the service pipe underneath the building. This service was installed in May, 1928.

30 "1112. Q. Yes, on the Empire Marble & Tile Company's block?
A. Yes.

"1113. Q. That is the one that the recent trial was about? A. Yes.

"1114. Q. A broken thread in the thing makes the two pipes come apart? A. It makes an opening at the threads and your pipes will pull out and sometimes far enough to cause a leak."

MR. SMITH: I would suggest that Your Lordship read 1117, 1118 and 1119 since you are only reading for information.

MR. WOODS: 1198 to 1206.

40 THE COURT: It strikes me that as any other Court that may have to deal with this matter would have to read these questions and answers with a view to seeing whether they should be allowed to go in as admissible evidence on the trial I think what I should allow you to do is to read them and put them in as part of the examination for discovery subject to

the objection that is raised. If, however, you intend to put in any other evidence orally along similar lines I will give further consideration to the objection.

MR. WOODS: I have not any present intention of doing that.

MR. MILNER: That puts it in this very difficult position. Mr. Woods says this is all the evidence he is going to give on this point and that means it is all the evidence he is going to give about the general nuisance and that is all the evidence he can give and if this bare evidence goes in we have to consider whether on our part we are going to rest on the point of law or whether we are going to try to put in evidence explanatory of each one of these instances just mentioned in a skeleton way by Mr. Woods in his case. You see, it leaves the defendant in a highly difficult position. 10

THE COURT: And that being so after they have been read and put in subject to objection I will make a definite statement as far as I am concerned but you will have to take the chance of course of that being right, if it is beyond you. That of course always follows doesn't it?

MR. MILNER: That is quite right, sir.

THE COURT: All right. You have read, Mr. Woods, 1059 to 1061, 1072 to 1078, 1084, 1091 to 1097, 1100, 1103 to 1114, and now you have started 1198. 20

MR. SMITH: I am suggesting here an application the same as I made this morning. I do suggest that you should read from 1114, the first question on top of the next page, in order that you may understand what those are. My friend asks the witness which of these occurrences were in our distribution system and which were on the owners' property, that is the householder's property, and the distinction has been clear. The response—

THE COURT: I understand you are asking me to direct the use of 1115 to 1120 inclusive if I finally rule that Mr. Woods is allowed to read what he has referred to already. I think under Rule 250 I should say that in my opinion what you are proposing to read and what you have read should not be used without my directing the use of this. 30

MR. WOODS: I am not opposing it if Your Lordship wishes to inform yourself. As far as that is concerned I am quite prepared to say you should read the whole of Mr. Garrett's examination on that subject.

THE COURT: I do, under Rule 250, direct that these questions and answers 1115 to 1120 be read along with what you are reading subject of course to this that I will rule later as to your right to put any in.

"1115. Q. All right, go on with the next one. A. That is all.

"1116. Q. That is all? A. Yes, sir, that is all prior to the fire.

"1117. Q. 771: How many explosions have occurred in Edmonton during the years 1929, 1930, 1931 and 1932, from gas that has escaped from the company's distribution system in Edmonton? You understand that that question does not refer to explosions occurring from gas after it has been delivered at the property line to consumers, but it refers to explosions of gas occurring in the company's system before it is delivered. Will you tell me how many explosions you have an account of?

10 A. Three.

"1118. Q. Being the ones you have just given? A. Being numbers 2, 3 and 6 which I have just given. I numbered them all.

"1119. Q. Can you give me those by name? A. Yes.

"1120. Q. Number 2? A. Is O. L. Archer; Number 3, W. C. Bradburn; Number 6, H. A. McArty."

MR. WOODS: And there is an incidental question comes in in order. 1151 comes in here. It happens the only questions up to date have to do with the things we have been discussing and now I am going on.

20 (Reading 1151): "And if you would be good enough to give me what his report to you is, showing what he did, and what the result of his activities were, and why he did it, I may not have to call Philpot? A. Yes. He turned off the gas at the meter and found the meter connection tight, and there was no gas escaping."

1165 to 1171.

MR. SMITH: I am taking objection at this trial that this evidence is inadmissible. The objection I took this morning I am repeating it that subsequent things done by us do not bind us.

THE COURT: I will hear the questions.

30 "1165. Q. MR. WOODS: Questions 154 and 158; they are the same question. I will read them so as to identify them. (Reads). Now, will you tell me what your present system of inspection of those pipes is? A. In the lane at the rear of the Corona Hotel between 106th and 107th Streets small holes about one-inch in diameter were drilled by the company after the fire through the pavement down to the intermediate pressure line. These holes were plugged; about once a month the plug is removed; our inspector smells for gas and if any odor is detected the hole is then flashed

"1166. Q. That is, flashed, meaning a match is lit? A. Yes.

"1167. Q. To see if there is any gas escaping? A. Yes.

"1168. Q. And if there is none the hole is plugged back? A. Yes.

40 "1169. Q. How far are those holes apart, Mr. Garrett? A. Twenty feet, approximately.

"1170. Q. That is over the whole of the system, is it?

*In the
Supreme
Court of
Alberta,*

*No. 7
Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.
continued.*

"MR. MILNER: I object, don't answer.

"1171. Q. MR. WOODS: When was that system of inspection inaugurated?

"MR. MILNER: I object to the form of the question.
A. We started it some time in 1932."

"1175. Q. That is the only change that has been made since the fire in the inspection system at this point? A. At certain times since the fire we have flashed oftener than once a month.

"1176. Q. That is flashed at these holes? A. Yes.

"1177. Q. Oftener than once a month? A. Yes. 10

"1178. Q. Why is that? Why would you flash oftener than once a month? A. It is a question of getting down to what is sound practice, or what is best practice. You can carry a system of inspection altogether too far and make it cost more than it is necessary.

"1179. Q. I did not get your answer. Is it better practice to flash more than once a month or is once a month enough? A. I don't know; there were times when we thought it was better possibly to do it oftener than that.

"1181. Q. How often during a month have you done it at any time? A. Once a week. 20

"1182. Q. Can you tell me why you would do it once a week rather than once a month? I mean would there be any indication of anything? A. There was just a question of judgment as to how often it should be done. One man might say it should be done once a week and one man might say twice a month, or once a month. Possibly another man might say it should be done every three months."

1189 to 1195:

MR. SMITH: I take it my objection applies to all and it won't be necessary to make it with every new set of numbers?

THE COURT: All right. 30

MR WOODS: (Reading 1189. to 1195)..

"1189. Q. This inspection of that particular area of more than once a month, was it in the interval while the old pipe with the jacket was still down? A. No.

"1190. Q. It was after the new pipe was down? A. Yes.

"1191. Q. To see whether the new pipe was letting gas out; is that the reason? A. No.

"1192. Q. Well, I am trying to find some reason for flashing more than once a month, if more than once a month is good practice?

"MR. MILNER: Mr. Garrett says it was a matter of trial, and they decided on once a month.

"1193. Q. MR. WOODS: But at some time subsequent to putting down the new pipe at the crossing on 107th Street at this particular area, you would flash at these holes once a week instead of once a month. Now, what caused you to change your practice? A. It was a question of judgment.

10 "1194. Q. Well, why did you exercise that judgment? A. We changed to once a month because we thought it was unnecessary to do it once a week.

"1195. Q. I see; in other words originally you used to flash, after you put in this system of flashing at these holes, you did flash once a week? A. Yes.

20 "1198. Q. MR. WOODS: The next one is 776 and 777; on the continuation of your examination, Mr. Garrett, I was asking you about a break in the service main in the rear of a dwelling of a man named Plahn on 114th Avenue and at that time you declined to answer that, on the ground that that was a thing that had happened subsequent to the fire and the Judge has directed that that is a question to be answered. Will you give me the details of the break in that main and what happened?

A. There was an explosion in a dugout cellar under the house of Mr. Plahn on March 5th, 1932. There was no concrete or brick foundation, the house resting on mud sills. Subsequently it was discovered that there was a broken thread on four-inch screwed line at a coupling about fourteen or fifteen feet from the house. This main was installed in June 1928.

"1199. Q. This house of Plahn's, it was not served by gas? A. Yes.

"1200. Q. The gas that escaped from the broken coupling had seeped through the ground into his cellar? A. There was no broken coupling.

30 "1201. Q. Wasn't there a broken coupling? What was it? A. A broken thread at the end of the pipe inside of the coupling.

"1202. Q. It was through that, that gas escaped? A. Yes.

"1203. Q. And the gas that so escaped seeped through the ground into the cellar of Plahn; that is right? A. I think so.

"1204. Q. And Plahn, as I have information, went down into his cellar with some form of a light for some purpose and an explosion happened? A. I am so informed.

"1205. Q. And that was at about—the time of day that is given to me is 8:05 p.m. Is that right? A. It was some time about then I think.

40 "1206. Q. And there was snow on the ground? A. Yes."

"1209. Q. You saw the place with the broken thread? A. Yes.

"1210. Q. And you saw the ground at the time of this explosion, yourself? A. Yes.

"1211. Q. Well, does that fairly represent a picture of it? I might

say it was taken on the 6th day of March by the McDermid Studios at the instance of the City of Edmonton. A. I am not able to identify it.

"1212. Q. Does it look something like it? A. Yes.

"1213. Q. Does that look something like Plahn's house with the hole where the gas main is? A. Yes.

"1214. Q. And do you know that there was a window marked with "X" there that was broken as a result of the explosion? A. I didn't observe that.

(Said Photographs marked Exhibits 23 and 24).

"1215. Q. There is another picture of it, with the hole. That is a correct representation of the hole and of Plahn's house at that time? A. Yes." 10

MR. WOODS: I have two photographs.

MR. SMITH: Are you tendering them now?

MR. WOODS: I will finish reading the questions and then you can make your objections in the matter (Reading): "Mr. Milner, I object to them being marked as Exhibits."

MR. WOODS: Now if the objection is to the taking of the pictures I can identify them. Mr. Garrett saw them taken and was on the ground and the weather was about the same and the condition of the soil elsewhere was the same. I am tendering these now. 20

MR. SMITH: I am objecting to them going in, on numerous grounds. My friend makes the statement about soil conditions. He may or may not prove it. I don't know. But I do not see why we want this record cluttered with photographs of some other building. I am objecting to these photographs. He cannot identify them. And Mr. Woods said, after marking two exhibits "there is another picture of it with the hole." Well that is a third photograph. But of these two there is no identification at all.

THE COURT: I do not believe they are admissible, Mr. Woods, at this stage. 30

MR. WOODS: Your Lordship observes the fact that the questions go to the possibility, which is an important point of this issue, the possibility or likelihood of gas penetrating that character of ground under winter conditions of that kind and the fact that it did so. The picture of the ground and the pipe and the soil is here.

THE COURT: You say the photograph shows it is the same kind of soil?

MR. WOODS: The photograph shows what it shows and whether it is the same kind of soil or not will subsequently appear when we put in our evidence and what the soil underground at 107th Street is. 40

THE COURT: I think the submission is a complete answer to your application for tendering them.

MR. WOODS: And Your Lordship does admit the photographs, as identified as stated?

THE COURT: I am dealing only with the examination for discovery. Later, of course, if you bring other evidence—

MR. WOODS: Of course there will be a good deal of evidence directed to the porous character or the non-porous character of the ground at the locus in quo.

10 THE COURT: Well we will meet that when we come to it.

MR. WOODS: I would like to have it marked as being tendered here so that I may bring the matter up again at that time.

THE COURT: The examination is quite sufficient for that.

MR. WOODS: (Reading):

“1216. Q. MR. WOODS: Then, Mr. Garrett, there was a further explosion or fire shortly after the fire, in a service main in the rear of a house on St. George’s Crescent, was there not? A. On March 24th, 1932, the City sewer manhole cover was blown off, and the employee of the City tested for leaks with a lighted match. Gas was found to be escap-
20 ing from a broken thread at a coupling on four-inch screwed line.

“1217. Q. That is in a service main in the lane in the rear of St. George’s Crescent? A. It was a main; we do not call it a service main; distribution main.

“1218. Q. I am sorry; I guess I used the wrong expression; it is the distribution main that runs for the houses along St. George’s Crescent? A. Yes.

“1219. Q. And there was a break in the thread, letting gas to escape from a coupling? A. Yes.

30 “1220. Q. And the gas that so escaped percolated the ground and got into the City manhole? A. Yes.”

“1226. Q. Can you find for me how far it was away from the City manhole? A. Yes.”

(And there is a letter of Milner and Company, dated October 18th, 1932).

“1228. Q. I want to know how far that gas percolated through the ground. And the conditions as to the weather, I mean as to freezing of the ground would be the same on the 24th March as it was on the 21st February? There would be no substantial difference in the ground, would there, on the question of whether the ground was frozen or not? A. The ground would be frozen on each date.”

40 MR. WOODS: That is the examination for discovery, my Lord.

*In the
Supreme
Court of
Alberta,*

—
No. 7

Extracts
from
Examination
for
Discovery
of Julian
Garrett,
Manager
of the
Defendant.
continued.

Evidence of James J. Christie.

Plaintiffs'
Evidence

No. 8.

James J.
Christie,
Examina-
tion.

JAMES J. CHRISTIE, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. What is your occupation? A. Night fireman at the Corona Hotel.

Q. And were you the night fireman at the Corona Hotel on the night of the 21st of February, 1932? A. Yes.

Q. And you have been in the employ of the Corona Hotel Company for some time? A. For about three years. 10

Q. And you got to your work on the night of the 21st February at what time? A. I was in the kitchen at five minutes to nine.

Q. And what did you do? A. I put my supper on the stove to warm up and then I went down in the basement. I hung my coat on the wall just beside the boiler and then I crossed over—

Q. You got there about five minutes to nine. The kitchen is this room, is it. That is the front of the hotel (indicating on plan). A. That is the south lane. This is the steps to the basement (referring to Exhibit 5). 20

Q. You went down after putting your supper on in the kitchen? A. Yes.

Q. The kitchen being the place I will mark "K." And the boilers are where, in the basement? A. About the middle.

Q. We will indicate that with "B." And you hung your coat where? A. On the left wall.

Q. And then what did you do? A. Then I crossed over to the water tank.

Q. And where is it? A. It is situated right about here.

Q. That is the hot water tank? A. Yes and I felt underneath to see if it was warm and I found it all right so I then went to get the garbage. The garbage was right beside that. 30

Q. You were on your way to the place to the elevator shaft where the garbage pail was ordinarily kept? A. Yes.

Q. In a box right in front of the metal door of the elevator? A. Yes.

Q. And you would walk down and go to your left in the way shown in the plan? A. Yes.

Q. And what occurred as you went down in that journey? A. Well just about 6 yards or so from the box of garbage I heard a hissing noise.

Q. Tell me what things are there? A. The coal bin, and the coke, and the stove coal and then the boiler coal. 40

Q. How many rooms are there? A. Three separate rooms.

Q. This is only roughly? A. Yes.

Q. And will you just describe those to the Court as well as you can. Are they roofed in? A. Well the coke bin is roofed in but the others are open.

Q. Is that the furthest one west? A. No, it is the one nearest the elevator. That is the coke bin. Then there is the stove coal and then the boiler coal.

Q. There are three bins? A. Yes.

Q. And the Eastern one is the coke bin? A. Yes.

Q. And it is covered over? A. Yes. There is a roof on it.

10 Q. The other two bins have no roof on them? A. No, no roof.

Q. The one next west being for stove coal and the one west of that being for boiler coal? A. Yes.

Q. And this roof on the one over the coke bin—how far is it from the ceiling? A. About a foot or a foot and a half, somewhere around that or 15 inches.

Q. Space between that and the ceiling? A. Yes.

Q. And how high is it from the ground? A. About 6 feet I guess.

Q. How high are you? A. 5 foot 10 inches.

20 Q. And how far does that coke bin come out from the south wall?
A. About 5 or 6 feet.

Q. And where was it that you heard this hissing noise? A. It was over and above this coke bin. It was towards the south wall.

Q. And what did the hissing noise sound like? A. Well I thought it was an escape of steam so I lit a match.

Q. Did you know of any reason for thinking it was an escape of steam? A. Well there was a radiator up above there in the dining room.

Q. And how did the steam pipe get to that radiator? A. Well it goes up from the boiler underneath.

30 Q. Did it go up along the back wall? A. Well I have never followed it out at all. I have never been in there.

Q. And you were on your way to the garbage? A. Yes.

Q. And tell us what you did when you heard this? A. When I heard this hissing noise I thought it was steam and I lit a match and held it up and suddenly there was a flash of flame in my face and I ran along the passageway.

40 Q. Which passageway is that? A. This passageway, until I got to the stair. And when I got to the stair I thought I was trapped. There was an awful lot of flame in the stairway. So I hesitated about the bottom of the stairs and I rushed up the stairs and into the kitchen and through the kitchen right to the office and I reported about the fire and then after that I came back.

Q. Can you remember whether you heard the kind of sound that was made when you were enveloped in flames? A. Well it was just a sort of—well it was not a hissing noise.

*In the
Supreme
Court of
Alberta,*

Plaintiffs'
Evidence,

No. 8.
James J.
Christie,
Examina-
tion.
continued.

Q. If you can remember the kind of noise you heard? A. It was just a low blast. It was not a loud explosion though.

Q. And you reported the fire? A. I reported the fire.

Q. Were you hurt yourself? A. Well I had my hair burned and my face at that time.

Q. You were pretty excited? A. Oh you bet.

Q. And then did you make any other journey back towards the fire?
A. I came back to the kitchen from the office.

Q. And what did you see? A. I saw the fire burning around the door going out to the lane and beside the kitchen stove. 10

CROSS-EXAMINATION BY MR. SMITH.

Q. Where was that fire burning in the kitchen? A. Beside the kitchen range by the door going out to the lane.

Q. What time did you get there? A. I was in the kitchen at five minutes to nine.

Q. And you would only be a couple of minutes going down stairs and hanging up your coat? A. Yes.

Q. And felt the hot water tank to see if it was warm? A. Yes.

Q. And did you look at the furnace to see if the steam was all right?
A. I looked at the gauge. 20

Q. What gauge—the hot water? A. Both gauges, the water and the steam.

Q. And the fire was all right? A. Yes.

Q. And the fire was all in the combination heater and garbage burner because that is what it was for? A. Yes.

Q. And was there any garbage there that night? A. Yes, there was garbage.

Q. How do you know? A. Well I was in there.

Q. You were 18 feet, from it, weren't you? A. Yes.

Q. Didn't you get a little closer than that? A. Well I would assume 30 there was garbage.

Q. I am asking you if there was and you said yes. A. Well the box was there.

Q. Do you know if there was any garbage there that night? Do you know? If you do not, just say so. A. Well I did not look in the box that night.

Q. And you heard this hissing noise. Does that best describe it to you—a hiss? A. Yes.

Q. It sounded as if something was going on in the radiator up above?
A. It sounded like a steam leak to me. 40

Q. Have you ever heard gas escape up a pipe? Do you imagine that steam under pressure would make any different noise from natural gas under pressure? A. I well I do not think so.

Q. I should not think so either. Were you injured that night?
A. I had my hair and face burned.

Q. And this explosion took place and the basement filled with flames —to use your expression? A. Yes that is the passageway from the garbage and up the stairway.

Q. Any flames up north of you in the basement? A. I did not look back there.

Q. Could you see back there? A. No. I never looked back..

Q. Were there lights on? A. Yes.

10 Q. And all you know is you came out and you found flames in the stairway? A. I came through flames all the way along the passage and up the stairway.

Q. Do you mean you actually walked through these flames? A. I rushed. I ran.

Q. Across that basement and all the way up the stairway? A. Yes.

Q. And the flames were snapping at you all the time? A. Yes, they were.

Q. And you were not looking down the basement to see if there were any flames that would not snap at you? A. I went up the stairway.

20 Q. You chose the one place where you knew you had to go through fire? A. I could not get out anywhere else.

Q. Why couldn't you? A. Where could I go?

Q. Well there was only one explosion. Now this is the difficulty I am in and that was in the same basement where there was a furnace burning and a garbage burner burning? A. Yes.

Q. Now don't you think if there was any considerable quantity of gas in there— A. Well there could not have been very much gas I don't think.

30 Q. You are quite convinced that at the time when you lit your match there was very little gas in that building? A. Well I could not say.

Q. Well didn't you say there was not much gas? I think you are right too but I want your opinion. But that was your view? A. It would be hard to say.

Q. All right. Perhaps it is not your view. Now who did you see when you came upstairs? Who was the man in charge of the office? A. Herbert Mayo.

Q. And what did you tell him? A. I told him to phone the Fire Department, that there had been an explosion.

Q. And what else did you tell him? A. That is all I told him.

40 Q. And who was the manager? A. Mr. Ardern.

Q. Did you talk to him? A. No I did not.

Q. Did you see Mr. Dyde? A. Yes.

Q. He is a clerk at the hotel? A. Yes.

Q. Who did you first tell how this fire started? A. I don't remember now.

*In the
Supreme
Court of
Alberta,*

Plaintiffs'
Evidence

No. 8.

James J.
Christie,
Cross-Ex-
amination
continued.

Q. Can you remember? A. Well there was so many around there I don't know.

Q. Did you or did you not tell any of the officers of this hotel how that fire started? A. I told Mr. Ardern I believe.

Q. And what did you tell him? A. I told him it started from the garbage burner.

Q. You told him you went down into the basement, that you opened the door of the garbage burner and flames flew out in your face and there was an explosion? A. Yes.

Q. And you told him that flames filled the basement, didn't you? 10
A. Not the whole basement.

Q. Well as much as you could see? A. Well the passage I ran along.

Q. I am speaking not of what actually was in the basement. I am speaking of what you told Ardern. I am speaking, remember, only of what you told Mr. Ardern. Whether it is true or not, do not let us worry about that for the moment, but what did you tell Ardern? A. I remember telling him about opening the door and there was an explosion there when I opened the door. I remember telling him that. But whether I said the basement was filled with flames—

Q. And did you subsequently make a statement to Mr. Ward and Mr. 20
Booth? A. Yes, I did.

Q. And Mr. Booth is the Fire Marshal in the City of Edmonton? A.
Yes.

Q. A man whose business it is to see why fires take place? Among other things he does, that I have no doubt? A. Yes.

Q. And when did you see him? A. I believe it was next day.

Q. Before you saw him you saw a doctor? A. Yes, I did.

Q. Who was that? A. Dr. Harrison.

Q. So that the night of this fire you told Ardern that this thing 30
started from an explosion from the garbage burner? A. Yes.

Q. And your face was sore I have no doubt? A. Yes it was sore enough. Well my head was sore then.

Q. And you saw Dr. Harrison and you told him in explaining the fire that it started as an explosion from the garbage burner? A. Yes.

Q. And you were suffering at the time? A. Yes.

Q. Quite severely? A. Well quite a little bit.

Q. No doubt at all when you saw Ardern and when you saw Dr. Har-
rison you were in quite severe pain? A. Yes.

Q. And then you saw Booth the fire marshal and Mr. Ward the fol-
lowing day. A. Yes. 40

Q. And you told them the same story and perhaps I will read it to you. You signed a statement for these people? A. Yes.

Q. "I have been in Canada since 1924. I was employed by Mr. Ardern, manager of the Corona Hotel as night watchman to look after the fires, clean up, etc." You remember that? A. Yes.

Q. "My duties started at 9:00 p.m. and I noticed it was 8:55 p.m. by the kitchen clock. I went into the basement." Do you remember that?

A. Yes.

Q. Didn't you do something with your lunch? A. I put it on the kitchen range to warm up.

Q. Didn't you put the fire on? A. No, the gas was turned on.

Q. And was anybody else in the kitchen? A. No.

Q. Somebody had gone away and left the gas burning in the kitchen range at 8:55? A. Well they always did.

10 Q. But gas was burning in the kitchen range? A. Yes.

Q. That is this same kitchen where you saw this fire later? A. Yes.

Q. Are you going to suggest it was a gas fire you saw in the hall of the kitchen, in the doorway? A. Well it was a fire in the doorway.

Q. So we find fire burning in three places, in the basement, first the furnace, and the garbage burner and thirdly in the basement. I said three in the basement, but the kitchen is up above and over an unexcavated part? A. Yes.

Q. And you say "And I took off my coat and went over to the water heater situated at about the centre of the basement?" A. Yes.

20 Q. "And opened the door and there was a dull explosion and flames shot out into my face." A. Yes.

Q. "The basement seemed to be filled with flame." I am reading what you said. Was it? A. Well not the entire basement.

Q. You did not get into the part that was not. You were in flames all the time? A. All the time I was down there.

Q. "The basement seemed to be filled with flame. I ran upstairs, through the kitchen to the office, and the clerk, Herbert Mayo was there. I notified him about the fire and he notified the Fire Department." That is correct? A. Yes.

30 Q. And then you say "I went back towards the basement through the kitchen. A lot of the plaster was knocked off the wall and the door from the lane up the kitchen was on fire, coal was used in the boilers and water heater, but gas was used for the coffee urns and fireplace upstairs and for a drier on the west side of the basement." That latter part is correct? A. Yes.

Q. The only incorrect thing is that the explosion did not take place at the garbage burner? A. No it did not.

Q. And who did you tell the story to next about the garbage burner? A. I do not know just all who I told it to.

40 Q. The first time you corrected it was on the 25th February when Mr. Booth went back to see you again? A. Yes.

Q. And did he have a photograph with him of the basement of that hotel? A. No, no photograph.

Q. He told you no doubt that they had found the garbage burner with an iron bar propped up against the door and holding it shut? A. I do not remember that.

Q. That they demonstrated to you or convinced you that the door of this burner was fastened shut by an iron bar and then you told this other yarn about the other explosion? A. I don't remember the iron bar.

Q. They told you it was locked shut? A. They said it was closed.

Q. After the fire they found this thing closed and told you about that and then you changed your mind and you told this second story? A. I don't know when I changed my mind. I don't remember when they told me that.

Q. They took a second statement from you, didn't they on the 25th February? A. Yes.

Q. (Reading)—"I would like to correct it in a few details." That is what you said. A. Yes.

Q. So your correction in a few details was to tell a completely opposite story to the one you told the first time. Who used the word "details"—you or Booth or who? A. Well I probably did.

Q. Don't flatter yourself, now. But did you work that out that way? A. Yes.

Q. And you told them the story you have told here today with respect to this explosion? A. Yes.

Q. And had you ever heard a sizzling noise before in that basement? A. No, I do not think I had.

Q. You had never observed any of our nuisance gas in this basement before or I should perhaps say "natural" gas, in the basement? A. In the basement.

Q. Yes. You never saw any stray gas in there before? A. No and I did not see any that night, either.

Q. I imagine it is difficult to see and I used the wrong expression, you did not discover any more that night? A. No.

Q. Even though you walked through the flames? A. No.

Q. And how far did you go through the flames? A. 30 or 40 feet.

Q. And a portion of that up stair way? A. Yes.

Q. Did you ever fight prairie fires in the old days in this country? A. No.

Q. Did you ever hear steam sizzling in that basement before? A. No, I never did.

Q. And you had been there how many years? A. Three years.

Q. Had you ever heard sound conducted from a distance along pipe lines? A. No I do not think so.

Q. Somebody has stated that there was a leak in our pipe at the corner of 107th Street and I think we have to admit there was. That would make a noise, wouldn't it, 35 or 40 pounds pressure coming out of that pipe? A. Yes I should think it would.

Q. Do you think that is what you heard? Don't you think it is? A. Well I do not know what I heard. I heard a hissing noise.

Q. You never found anything wrong with the steam pipe before in that basement? A. No.

Q. I just wonder if this sizzle did not appear to come from some distance? A. It appeared to come from the south wall.

Q. Our gas mains are laid along behind your south wall? A. Well I don't know.

Q. Well please take it from me that they are. This main runs along the south wall a distance of three feet down from the surface? A. Yes.

Q. Now do you smoke? A. Yes.

Q. Were you smoking at the time? A. No.

Q. What do you smoke—cigarettes or pipe? A. Cigarettes.

10 Q. And there is no doubt that anybody who had walked to the spot you were at would have heard that sizzling noise if it had been there? A. Oh, yes. I heard it the first time I was there.

Q. Was it a good sizzling sizzle or a little whisper? A. Well I had no difficulty in hearing it.

Q. And you were 18 feet from the south wall? A. No, 5 or 6 feet.

Q. And was it quite a loud hiss? I said "sizzling" but should have said "hiss?" A. Yes.

Q. And was it loud? A. Yes.

Q. So startling that you lit a match to see what it was? A. Yes.

20 Q. And there was no question it was some sort of gas or vapor under considerable pressure? A. No doubt about it.

Q. There was no doubt about it in your mind at all? A. No.

Q. You were an employee of the hotel? A. Yes.

Q. And you were doing your ordinary duties that evening in passing through the basement and looking at the hot water heater and hunting for the sizzling noise and so on? A. Yes.

RE-EXAMINATION BY MR. WOODS

Q. Was there a steam pipe in the basement? A. I think so.

30 MR. SMITH: My friend asked about those steam pipes in his examination in chief. He received a reply that the witness knew that there was a radiator in the dining room above and did not know how the steam pipe approached that radiator. Now I do submit, with respect, that this is not re-examination..

MR. WOODS: If that is the reply I got, my friend was right. I had not remembered what the witness said. That is why I asked him this question. I cannot remember whether your Lordship has a note of that or not but I wanted to be sure in view of the fact that my friend did ask him. He mentioned about the fact of hearing the sound, and I will take your
40 Lordship's ruling.

THE COURT: Whether it is re-examination or not, you may go on.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence,

No. 8.

James J.
Christie,
Cross-Ex-
amination
continued.

Re-Exam-
ination

Q. MR. WOODS: Just tell me, did you know whether there was a steam pipe in the basement or not, running up through the basement?
A. Well I had never seen the pipe. I had never traced the steam pipes in the basement.

Q. Now when you gave this second statement that my friend has mentioned, to Mr. Ward and Mr. Booth — Mr. Booth is the City Fire marshal? A. Yes.

Q. And Mr. Ward was the Government fire investigator? A. Yes.

Q. On the 25th of February my friend asked you whether they told you that the door was closed or suggested to you that they told you that the door was closed—the door of the garbage burner was closed before you corrected your statement. Is that so or did you correct your statement to them as to the door of the garbage burner, that story not being correct, before they said anything to you about whether they discovered the door was closed or not. A. I corrected my story first. 10

THE COURT: He made three answers to that, the first, "I believe I did," the second, "I did," and the third, "I think I did."

MR. WOODS: Have you a memory of the matter now? A. Well I corrected my statement first.

Q. And you did say first you thought you did? 20

THE COURT: Did you say that? A. I may have done.

Q. MR. WOODS: Did you say that? A. Yes, I did.

Q. And you saw Dr. Harrison the same day as the fire? A. Yes.

Q. He came to attend you? A. I went around to his place.

And the statement you made to Mr. Ardern was that day? A. It was that night, the night of the fire.

Q. What you now say is the incorrect statement? A. Yes that was the night of the fire.

Q. The incorrect statement as to the night of the fire? A. Yes.

Q. How was the hotel heated? A. Steam heated from the boilers. 30

Q. And the boilers were in the basement? A. Yes, pretty close together.

Q. THE COURT: I do not quite understand why you say you lit the match?

MR. WOODS: Will you explain that to the Court? Why did you light the match? What did you expect? A. I expected to find a leak of steam.

Q. How far was it up? Was it above your head? A. I looked over the top of the coke bin.

Q. Was it to give you light to see something? A. Yes, I expected to see steam there and I lit this match to look in. 40

Q. You are 5 ft. 10 inches high and this face of the coke bin is 5 or 6 feet from the wall? A. Yes.

Q. And there is a roof over it which is 15 to 18 inches below the roof and there is a space going back there? A. Yes.

Q. And it was from that space that the sound was coming? A. Yes.

Q. And you lit a match, why? Could you see in there? A. I could not see in there how many lights—

Q. THE COURT: I thought you said the hissing noise came from some distance away. Where do you say first you thought it came from?

10 A. From the radiator in the banquet room.

Q. And by lighting a match where you were did you expect to be able to see the steam coming from that place where you thought it was coming from? That is what I am interested in at the moment? A. Well from the pipes leading to it.

Q. MR. WOODS: That radiator would be where in relation to the place you were standing at? A. It was right above the coke bin.

Q. In the same room? A. No, in the banquet room.

Q. And the floor between you and it? A. Yes.

20 Q. And the match would help you to see the steam coming from where it was? A. Well, it would help me to see. I thought it was from the pipe leading into the radiator.

Q. What? A. I thought it was from the pipe leading into the radiator.

Q. And where did the pipe come? A. Well I thought it was back against the wall.

Q. MR. SMITH: Of course he has already said he did not know.

(THE WITNESS): I assumed it was back against the wall that is all.

Q. MR. WOODS: You told us you had not seen it. A. No, I had not seen it but I think it was back against the wall.

30 RE-CROSS-EXAMINATION BY MR. SMITH.

MR. SMITH: May I have my friend's and your permission to ask a question?

THE COURT: You have mine and that is sufficient.

Q. MR. SMITH: What sort of door is there leading to the kitchen?
A. Well it is an open screen door.

At 4:25 Court adjourns till 11:00 a.m. Tuesday, January 16th, 1934.

Tuesday, January 16, 1934, Court Resumes at 11:15 a.m.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

—
No. 8.
James J.
Christie,
Re-Examination
continued.

Re-Cross-
Examination.

*In the
Supreme
Court of
Alberta*

No. 9.

Ruling by Trial Judge Upon Admissibility of Questions and Answers in Examination for Discovery of Julian Garrett Relating to Other Fires and Explosions.

Plaintiffs'
Evidence

No. 9.
Ruling by
Trial Judge
upon
Admissi-
bility of
Questions
and
Answers in
Examina-
tion for
Discovery
of Julian
Garrett
relating to
other fires
and
explosions.

16th Janu-
ary, 1934.

THE COURT: I will make my ruling on the question I reserved yesterday. I am told that Mr. Justice Ewing on the matter being referred to him expressed the opinion that the discovery which has been put in with regard to what Mr. Woods has described as other mischiefs should be made. I do not take this ruling to be an expression of opinion that the evidence would be admissible on the trial. Having considered overnight the question raised I have come to the conclusion that even if I admitted the evidence I would disregard it standing alone as evidence either of negligence or of nuisance. Furthermore, in my opinion the evidence should not be admitted on the principle enunciated by Lord Watson in Metropolitan Asylum District vs. Hill (1882) 47 L.T. 29, in the passage quoted by Mr. Justice Beck speaking for the Court in Babcock vs. C.P.R., 9 A.L.R., at page 384. The whole question involved in my ruling is a rather difficult one and a discussion of it will be found in Chapter 11 of Phipson on Evidence 7th Edition. The Metropolitan Asylum case in which the evidence there in question was admitted differs from the present but the principle enunciated, in my opinion, leads to the exclusion of the evidence in the present instance. So far as the suggestion that the series of mischiefs alleged constitutes a warning, either as giving rise to or as increasing or being an accentuation of the duty to take care (negligence) or to prevent damage (nuisance) the evidence in my opinion does not advance the case in either respect. The duty to take care is clearly present and if there is a liability apart from negligence the amplification by the warning suggested adds nothing.

MR. WOODS: This judgment is a judgment upon the questions and answers in the examination for discovery of Mr. Garrett relating to the other fires and explosions, as I gather, and only to that?

THE COURT: Quite So.

No. 10.
Herbert
Mayo
Examina-
tion.

No. 10.

Evidence of Herbert Mayo.

HERBERT MAYO, having been called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. What was your occupation on the 21st February, 1932? A. Clerk in the Corona Hotel.

Q. Night clerk? A. Evening clerk.

Q. And what time did you come on? A. It was four o'clock then.

Q. And you were acting as night clerk on the night of the 21st February, 1932, at the Corona Hotel? A. Yes.

Q. Did you have any unusual experience that night, the night of the Corona fire? We have had evidence that there was a fire at the Corona Hotel. A. Yes, that is the only unusual experience I can say.

Q. What do you know about the fire? A. Well I know it started in the basement.

10 Q. Well tell us just what you heard about it, first, and what you knew about it? A. The first I knew of it was an explosion. It sounded like it came from the basement, in fact I am sure it was, and it shook the building a little. You could feel it on your feet.

Q. About what time was that. Do you remember the time? A. Nine or a few minutes after, somewhere around there.

Q. In the evening? A. In the evening, yes.

Q. And what did you observe as a result of this shaking. A. It shook one or two bricks loose in the brick fireplace in the lobby and soot came down the chimney.

Q. There was a fireplace in the corner of the lobby? A. Uh-uh.

20 Q. THE COURT: You mean "yes" do you? A. Yes.

MR. WOODS: There is a fireplace in the corner of the lobby. Which corner? A. As you go in the door in the far left hand side of the lobby. That would be the east side.

Q. And towards the south, that is the southeast corner of the lot? A. The southeast corner.

Q. And there is an open fireplace that is there and the soot came down that fireplace? A. Yes.

30 Q. Now what did you next observe? A. Well as far as I can remember the next thing was Jimmy coming up from the kitchen. There was a passageway from the kitchen to the rotunda and Jimmy came up.

Q. That is James Christie? Yes.

Q. What was his position? A. Night fireman.

Q. And what was Jimmy's appearance as he came out and how did he come out? Did he run out or walk out or how? A. Well he came out fast. I would not say he was running, but next to it.

Q. And what did you observe about him as he came out of the kitchen into the lobby? A. Well his hair was singed and he was holding his face and rubbing his eyes. He just looked like he had been in some fire.

40 Q. And what did you do? A. I told the bell hop to watch the desk and I ran right back to the kitchen. I went as far as the kitchen door and saw the fire and went back and phoned the Fire Department.

Q. Where did you see the fire in the kitchen? A. The first place I noticed was in the door leading to the alley in the kitchen.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 10.

Herbert
Mayo,
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 10.
Herbert
Mayo,
Examina-
tion.
continued.

Q. Whereabouts on the door, do you remember? A. It was along the base of the door.

Q. And did you notice it anywhere else in the kitchen? A. I could not say clearly right now but I think it was along the wall towards the stove.

Q. What wall of the kitchen would that be? A. That would be the south wall.

Q. And then you came back and phoned the Fire Department.
A. Yes.

Q. That kitchen—there has been evidence that the kitchen range 10
or stove was lit. It is heated how? A. By gas.

Q. The kitchen range? A. Yes.

Cross-Ex-
amination

CROSS EXAMINATION BY MR. SMITH

Q. You saw some fire from the door? A. Yes.

Q. That is the door leading to the alley? A. Yes.

Q. And I take it you were quite excited after you saw Christie?
A. No.

Q. Are you always cool and collected? A. I think so.

Q. So we have an explosion in the hotel. You thought it was an
explosion, didn't you? A. Yes. 20

Q. And how long was it after you heard that that you saw Christie?
A. About two or three minutes.

Q. So having heard an explosion in the basement you, the clerk on
duty, stayed at your post for two or three minutes? A. Yes.

Q. Didn't it occur to you to go and see what was the matter?
A. Well I did not figure it was anything important at all. I thought it
was probably in the fireplace.

Q. Are you used to having explosions in the Corona Hotel? A. No.

Q. And can't you give me any better reason why you did not go to
see what it was? A. Well at one time in the base of the fireplace, you 30
know where the ashes drop through?

Q. Yes. A. It started to smoulder and smoke up once and I thought
it was the same thing.

Q. In other words, the reason you did not go was you thought this
thing was so inconsequential, so simple, that it did not disturb you?
A. No not greatly.

Q. Didn't it disturb you at all? A. Well I could not say.

Q. Now prior to that you had seen this fireplace give what we might
call a puff and blow ashes up from the bottom? A. No.

Q. Well what did you say prior to this? A. Smoke came up and 40
came around the chimney and we just went down and raked it out.

Q. And you thought it was the same thing again? A. I could not
say. I might have at the time but I imagine it is about what it was.

Q. And I thought you said a moment ago you thought it was the same thing? A. I could not say. I don't know.

Q. Well tell me now. No doubt you thought it was that same thing again and you were not disturbed, were you? A. Not greatly.

Q. And you got quite a shock when you saw this chap come in with his hair singed, and I suppose it apparently had been burned? A. Well it was not apparent it was burned.

Q. Well if it burned it was apparent wasn't it? However we won't quarrel over that.

10 Q. Anyway, you got a shock, didn't you, when you saw this chap? A. Yes I was surprised.

Q. And you knew he was in the basement too? A. Well yes. That was his place.

Q. And after having heard what you did and seeing him come up in the condition he was you were surprised at his condition? A. Sure.

Q. I wrote down this answer, you said you saw some fire in the kitchen door and Mr. Woods asked if you saw any fire anywhere else and you said "I don't remember clearly but I think it was along the south wall." A. No I did not say that.

20 Q. (Questions and answers read). Now you have heard what you said a moment ago. A. I thought you meant—I thought it was along the south wall. I know definitely it was on the south wall but I am not sure whether it was behind the stove or not.

Q. What you mean to say is you remember seeing some fire on the south wall but you did not quite know where it was? A. I know it was on the door.

Q. Did you see any other fire except the fire on the door? A. Well towards each side of the door and I thought it was along the wall.

30 Q. We will put it this way. You saw some fire on the door which extended towards the sides of the door. Right so far? A. Yes.

Q. And you do not know whether it reached the wall or not. Is that about the situation? A. Something like that.

Q. Well is it right? A. Yes.

No. 11

Evidence of J. Walter S. Chappelle.

J. WALTER S. CHAPPELLE, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

40 Q. You live in Edmonton and your occupation is what? A. Civil Engineer.

Q. And you are employed in what capacity. A. Civil Engineer.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

—
No. 10.

Herbert
Mayo,
Cross-Ex-
amination
continued.

No. 11.
J. Walter S.
Chappelle
Examina-
tion.

Q. I mean are you in the Provincial Government Service? A. Department of Public Works, Province of Alberta.

Q. On the 21st of February, 1932, I believe you lived at the old Corona Hotel, did you? A. I was living in the old Corona Hotel.

Q. And we have it that there was a fire on the night of the 21st February, 1932 that burned down the Corona Hotel. Now where were you when that fire started? A. I was in the writing room.

Q. Where is the writing room? Just give me an idea on this plan. The door into the writing room is on the east side of the lobby nearer to the south than to the north as shown on the plan? A. Yes, in the south-east corner of the main lobby. Q. Now what time was that you are now speaking of? A. It would be between 8:45 and about 9:00 o'clock.

Q. And how was your attention drawn to the fact of this unusual occurrence? A. I heard an explosion, a movement of the floor.

Q. Can you describe what we call an explosion, what sort of sound was it, as nearly as you can give it? A. It was not a sharp explosion of dynamite but it would be more resembling the explosion of wet powder or gas.

Q. In your business as an engineer you have experience of explosions, I apprehend. Am I right? A. That is correct.

Q. And you can differentiate between a detonation of dynamite explosion? A. It is quite easy to distinguish between the quicker explosion of dynamite and the slower explosion of black powder or gases.

Q. And what did you observe immediately after this while you were in the writing room? A. My attention was directed to a haze rising from the floor and from the wainscotting of the dining room.

Q. And what was happening to the wainscotting of the dining room? A. It appeared like a haze or a fog.

Q. And did you see anybody rushing around? A. There was no excitement at that time.

Q. Well when was the first time you did see any excitement, and how soon after that? A. There were two or three others in the writing room. They were behind me. One said "there has been an explosion."

MR. SMITH: I wonder if we should have these conversations.

THE COURT: On what principle do you suggest you can get them in?

MR. WOODS: I do not suggest that. We can eliminate that.

THE COURT: I suppose that statement would have been given within the waste paper basket rule of the res gestae.

MR. WOODS: You cannot give in evidence something that somebody said to you and any conversation between you and your neighbors

in the writing room is not evidence here. I want to know what you saw in the way of anybody rushing around. A. I saw a man come from the direction of the kitchen. He was agitated.

Q. Did you notice anything about him to agitate him? A. I noticed his hair had been singed, his face was white. I knocked some sparks from his clothes.

Q. You went out of the writing room by this time? A. I apparently folded my letter and walked into the lobby and that is where I saw him.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 11.

J. Walter S.
Chappelle
Examina-
tion.

continued.

10 THE COURT: Of course if that man said something it might be different. I did not want my previous remark to be taken to apply to anything that Christie might have said.

MR. WOODS: Do you know the night fireman, Christie around the hotel? Had you seen him before? A. Yes I had seen him before.

Q. Did you know this man was Christie? A. I could not identify him.

Q. Was his appearance different? A. His appearance was different. The man I saw had the same physique of Christie, the general appearance possibly.

20 MR. SMITH: I have no doubt it was Christie.

Q. MR. WOODS: Could you recognize him as Christie? A. I would not take an affidavit to that effect.

Q. You were not very familiar with this night watchman, I suppose? A. No.

Q. But on the other hand, you told us that he seemed agitated? A. He seemed agitated.

Q. Did you see him here yesterday? A. Yes.

Q. Would you have recognized him yesterday for the same man that you saw running out of that place? A. No.

30 Q. Why—because of any— A. His general appearance was entirely different.

Q. Well his agitation had an effect? A. Yes his agitation would affect his appearance to that extent.

Q. And you knocked some sparks off Christie's coat? A. Yes.

Q. And then what did you do? A. I remained in the lobby.

Q. And how long after that was it that you went up to your room? A. A matter of probably two or three minutes.

Q. Did you go to your room more than once? A. I went three times.

40 Q. Why? A. I went to advise my sister who was in our suite of the occurrence which I had observed while in the writing room.

Q. And how long in your estimation was it after that first explosion as described by you that the lights went out in the lobby and in the writing room? A. I was in my room when the lights first flickered and then they went out and did not come on again. That was probably—I estimated at the time about twelve minutes.

Q. That is your estimate. You did not use a watch on it? A. No I had not a watch. That was the time consumed walking up and down-stairs and approximately the time I would be in the lobby.

Q. You estimate it would be ten minutes from the time you heard the explosion? A. Yes.

CROSS-EXAMINATION BY MR. SMITH.

Q. Were there many sparks in this man's clothing? A. I saw his coat burning in two places.

Q. On his shoulders? A. On his arm.

Q. And you have some knowledge, I take it, of fires as well as of explosives? A. More explosives than fire.

Q. Christie's coat did not suggest any particular kind of explosion to you? A. No.

Q. And did he look like a man whose clothing looked to be like that of a person who had gone through 30 feet of flames. Have you any knowledge of things like that? A. He had the appearance of having 20 been in contact with flame.

Q. That is obvious because there was flame upon him. But I was wondering whether you had formed any idea of how much flame he had encountered? A. No.

Q. Now this fog which arose in the room. Was there a rug on the floor? A. I take it there was.

Q. And it may have been dust? A. It may have been dust.

Q. Don't you know? What do you think it was? A. It may have been dust. It may have been something else.

Q. In other words, it might have been fog, to use the expression you 30 first used, and that might be correct? A. Yes.

Q. Now about explosions of dynamite and wet powder and gas. All you intend to say is that some explosives are more rapid than others? A. Yes.

Q. And in your judgment this was not particularly rapid? A. I mean to convey that it did not appear to be dynamite.

Q. And that is all. Thank you. What number was your suite or room? A. I think it was 222 on the second floor. That is the top floor facing the front.

No. 12.

Evidence of Charles Albert Hebb.

*In the
Supreme
Court of
Alberta*

CHARLES ALBERT HEBB, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Plaintiffs'
Evidence

No. 12.
Charles Al-
bert Hebb,
Examina-
tion.

Q. You were a guest or occupied a room in the Corona Hotel as a guest on the night of the 21st February, 1932? A. I did.

Q. You were living then at the Corona Hotel? A. Yes.

10 Q. What is your occupation in Edmonton? A. At the present at leisure.

Q. You were employed with the Northwest Biscuit Company? A. Yes.

Q. And on the night of the 21st February at about—there was a fire in the Corona Hotel that burned it down. Now tell us when you first had any indication of anything to do with that fire and what time it was, where you were, where your room was, and give us an account of what you did? A. I was in bed reading at the time.

Q. What time? A. Approximately nine o'clock.

20 Q. Go on. A. I heard a report accompanied by vibration of the building and the crash of glass, a dull thud sound. I got up and looked out of the window. The impression I received was that a truck had collided with the building and I looked out to see the cause but saw nothing and returned to bed.

Q. And continued in bed? A. Yes.

Q. Your light was on and you were reading in bed? A. Yes. I continued and in a few minutes I heard the Fire Department approach and when they stopped near the hotel as I thought I got up and looked out of the window again to see what I could see. I did not see anything so I returned to bed again.

30 Q. You heard a dull thud and you got an impression as though a truck had struck the building? A. Yes.

Q. You got out of your bed where you were reading? A. Yes.

Q. And your room was on what floor? A. On the top floor about midway between Jasper Avenue and the alley.

Q. And on what side? A. On the east side.

Q. And you looked out of your window and could not see anything? A. No.

Q. And you got back in bed and continued to read. Is that right? A. Yes.

40 Q. And you heard the fire equipment come? A. Exactly.

Q. And you again got out of your bed and looked out of your window? A. Yes.

Q. This time in what direction? A. I looked out of the front.

Q. The first time which way did you look? A. The rear.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 12.

Charles Al-
bert Hebb,
Examina-
tion.

continued.

Q. Why did you look to the rear? A. The impression I received was that the noise was in that direction.

Q. And then you looked in the front and you did not see anything there especially? A. No.

Q. And you again went back to your bed and continued reading?
A. Yes.

Q. Now proceeding on from there. What did you do? A. Well after a few more minutes had passed I heard loud voices in the hall and naturally I concluded there was something wrong somewhere in the building or near, so I got up and went out as far as the main stairway in front of the building where I heard somebody say—I think I heard somebody say— 10

Q. Well what you heard anybody say is not evidence, or what anyone said to you or what you heard them say is better not to be given. A. I saw smoke for the first time.

Q. And what did you do? A. I returned to my room with the intention of dressing fully.

Q. You thought it was time you got dressed then. You were in your pyjamas? A. Yes.

Q. Did you get dressed? A. Well when I went out into the hall I naturally put a dressing gown on. 20

Q. And you came back to your room and the lights were still alight?
A. Yes, exactly.

Q. And you took your dressing gown off and put on some clothes other than your pyjamas? A. Yes.

Q. How much clothes did you put on? A. I put a suit and overcoat over the pyjamas.

Q. Did you put your shoes on? A. Oh yes.

Q. And did you put your socks on? A. Oh yes.

Q. At all events you put your shoes and socks on and pulled a suit over your pyjamas, and I suppose you did all this pretty hastily? A. Yes. 30

Q. Pretty much in a hurry? A. Yes.

Q. And what did you do then? A. I left the building by the fire escape in the rear.

Q. Now tell me when you left your room how were the lights in your room? A. They were on but I had intended to dress fully but they started to flicker so I decided it was the best thing to get out as quickly as possible, so I did not dress fully.

Q. They started to flicker when you were still in your room? A. Exactly. 40

Q. And they were still on but flickering from time to time when you left your room? A. That is right.

Q. And you went out of your room and went to the fire escape at the back of the building? A. Yes.

Q. And went down the fire escape? A. Yes.

Q. Now can you give me any idea when the lights in the building went out? A. Dating from the time of the explosion.

Q. Well how soon after you went down the fire escape did the lights of the building go out? A. It was either while I was descending or just after I reached the ground that the lights went out and I cannot say definitely. I cannot remember.

10 Q. And would you like to give the nearest estimate you can of the elapsed time between the time you heard the first reverberation or dull thud you have described and the time when the lights went out? A. Between 15 and 20 minutes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 12.
Charles Al-
bert Hebb,
Examina-
tion.
continued.

No Cross-Examination.

No. 13

Evidence of Harold Edward Gilbert Hotham Schofield.

HAROLD EDWARD GILBERT HOTHAM SCHOFIELD, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

No. 13.
Harold Ed-
ward Gil-
bert
Hotham
Schofield,
Examina-
tion.

Q. You are connected with the Relief Department of the Provincial Government? A. Yes.

20 Q. And on the night of the 21st February, 1932, you were living at the Corona Hotel? A. Yes.

Q. At the old Corona? A. Yes.

Q. And you were there when it was burned down? A. Yes.

Q. And where was your room? A. On the second floor almost in the middle of the hotel on the north side facing Jasper Avenue.

Q. And where were you when you first got any alarm that resulted in the fire? A. I was sitting in one of the window seats in the rotunda reading a magazine and I was conscious of a dull sort of sound like a thud and a slight vibration.

30 Q. About what time of night was that? A. I would say about ten minutes past nine, between nine and ten minutes past.

Q. What did you see other than what you have told us? A. In the first instance I went on reading. I did not connect it in my mind with anything of any importance or seriousness. Two or three minutes after I noticed a little smoke at the other end of the rotunda around the fireplace.

Q. Were you facing the fireplace? A. I was facing as it were the counter in the northwest corner of the rotunda.

Q. You would really have your back to the fireplace? A. No, the fireplace was off left in the other corner.

40 Q. Anyway, you noticed specially in the fireplace up to this time— where did you first see the smoke? A. The first smoke I saw was around the fireplace. It looked as if it was coming up from underneath the floor, and the second time I saw any smoke was a thin veil of smoke in the dining room.

Q. That is in the main dining room? A. The main dining room.

Q. And what did you do when you saw the smoke? A. I went on reading.

Q. You must have had an interesting book. A. Well there were not very many people in the rotunda and there seemed to be no excitement and there was very very little smoke. It increased more and more and I got up and went to the desk and asked what was the matter and they told me there had been a slight explosion in the basement and I gathered it was not very serious and I went back and went on reading until I saw a number of people coming down the stairs, some with clothing over their arms, and I walked over to one of the men, Mr. Fred White, M.L.A. from Calgary, and I said: "Hello" to Fred, "What are you up to, what is going on?" 10

Q. Anyway, we do not need to bother with that? A. I noticed a lot of people coming down stairs and I came to the conclusion it was about time I got my goods out and I went over to the desk and asked for my key and I got my key and went over to the stairway and there was a tall policeman there in a fur coat and he said, "You can't go up here, sir." So I did not go up to my room and I went over to the rack and put my coat on and walked out. 20

Q. Were the lights on then in the rotunda? A. Yes, I think so when I went out. I am rather hazy about the lights.

Q. You went over to see the tall policeman. Was it in the light or in the dark? A. I went over to get my coat from the rack. It was not dark then.

Q. Do you remember when the lights went out? A. No, I don't.

Q. How long do you think it would be from the time that you heard this noise that you have described the first time you heard it, up to the time you got your coat from the rack and walked out? Give us the nearest estimate. A. I don't think it would be more than a quarter of an hour to twenty minutes at the outside. 30

Q. That is as far as you would like to go? A. Yes.

CROSS EXAMINATION BY MR. SMITH.

Q. I suppose you lost your goods. A. Yes.

Q. They were burned up? A. I took the key with me.

Q. Have you made any claim against the gas company for these goods? A. I made a claim, yes.

MR. WOODS: I had another witness but he is at the hotel and my next witness is Captain Williamson.

MR. SMITH: If your Lordship pleases, might I ask to have any other witnesses from the fire department excluded? They will be giving evidence of the same events? 40

(Witnesses excluded).

No. 14

Evidence of George Williamson.

*In the
Supreme
Court of
Alberta*

GEORGE WILLIAMSON, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Plaintiffs'
Evidence

No. 14.

George
Williamson
Examina-
tion.

Q. You are a Captain in the Fire Brigade? A. Yes.

Q. You are attached to what station? A. Number 2.

Q. And where is Number 2 station? A. On 104th Street south of Jasper.

10 Q. On the west side of 104th Street? A. Yes.

Q. South of Victoria Avenue? A. No, it is between Victoria Avenue and Jasper.

Q. You would be relatively a short distance, from the standpoint of the brigade, from the Corona Hotel? A. Yes.

Q. Do you remember an alarm of fire coming in to Number 2 station on the night of February 21st, 1932? A. I do.

Q. What time was it the alarm came in? A. Eleven minutes past nine.

20 Q. And how long did it take the first of the fire equipment to get from the fire station on 4th Street to the Corona Hotel? A. I would say it would take it between two and three minutes.

Q. And you went on the piece of the first equipment? A. Yes.

Q. That equipment was what? A. It is called a combination. The combination is composed of a hose and chemical waggon.

Q. The chemical is a thing—did you take it? A. It is a sort of acid extinguisher to which there is a small hose attached which is used for putting out small fires.

Q. But the acid extinguisher, the thing containing the acid remains on the truck? A. Yes.

30 Q. You take off the small hose? A. There is a 40 gallon tank equipped with about 150 feet of small hose.

Q. And there is also a larger hose? A. Yes.

Q. On a truck which you call the combination? A. Yes.

Q. And who was on that combination with you? A. There was the driver Hobbs and Constable.

Q. Constable was a fireman? A. Yes.

Q. He is not a constable? A. No.

Q. And anybody else? A. That is all on that truck.

40 Q. And that I gather was the first piece of equipment that got to the fire, was it? A. Yes that was the first.

Q. And where did it go? A. It went back to the rear of the hotel in the lane.

Q. And you drove up with your usual celerity and speed into the lane? A. Yes.

Q. And stopped back of the hotel? A. Yes.

Q. What did you first observe when the combination truck stopped? A. The first thing we observed was a fire burning in the lane at the rear of the hotel.

Q. Will you describe that fire to us and tell us where it was burning? A. It was immediately west of the basement door. It was a flame about 3 or 4 feet long burning along between the concrete of the lane and the wall of the hotel.

Q. The south wall of the hotel? A. Yes.

Q. The south wall of the hotel being brick? A. Yes. 10

Q. And this fire was coming up between that brick wall of the hotel and the concrete pavement of the lane? A. Yes.

Q. And it was coming up about how high? A. About a foot high.

Q. Could you tell us the color of it? A. It was blue with orange on the top.

Q. And could you tell us how it acted? Was it a steady flame? A. Yes it was a steady flame.

Q. And was it a sooty flame or a clear flame? A. I did not notice that.

Q. Now that is the lane south of the Avenue. Now it shows on here a door at the point I am marking, and is that the door to which you refer as the basement door? A. As the basement stairs. This is what I referred to as the basement door. 20

Q. Now where did you see these flames? A. Well immediately west of this door.

Q. I will put a few dots there to give the impression of where you say you saw these flames. Do you know how far they extended? A. As far as I can remember about 3 or 4 feet. They ran on about 3 or 4 feet.

Q. And then what did you do? A. I went in through that basement door.

Q. The door was open? A. Yes.

Q. You opened it with your hand I suppose? A. No, it was open. 30

Q. And what did you find when you went in? A. Found some fire just immediately to the west of the inside.

Q. There is a basement door and then there are steps going down to the basement? A. No, there is a small platform you step on first.

Q. There is a small platform and then steps down to the basement? A. Yes.

Q. And to the left of the small platform is the kitchen door? A. Yes.

Q. If you came out of the kitchen door you would step on to this small platform and from there out of the basement door to the lane? A. 40 Yes.

Q. And if you turned to the left coming out of the kitchen door you would go down the steps to the basement? A. Yes.

Q. And did you go down the steps to the basement? A. No, we went to put the fire out in the wall first.

Q. What wall was that? A. Immediately through the door leading to the kitchen off this platform, that would be the other wall just immediately on entering there on your left. That is where it was burning.

Q. The kitchen door then would be open, would it, or do you remember opening it? A. I don't remember opening it.

Q. But you did see a fire on the south wall of the kitchen? A. Yes.

10 Q. And just give me as nearly as you can. I know it is hard to remember, but give as nearly as you can where that fire was on the south wall of the kitchen? A. The fire would be—I can't just—

Q. This door seems to be a door into the lane and there is the south wall? A. Well immediately inside this door up about 5 or 6 feet on the wall, 5 or 6 feet high.

Q. On the south wall of the kitchen there was a fire burning? A. Yes.

20 Q. Will you—what sort of a flame was it? A. There were a couple of holes in the wall as though the plaster had fallen off. And this fire was turning out through these holes.

Q. Did it seem an active fire? A. No, it seemed just a lazy sort of flame, it did not seem to have any pep to it.

Q. A lazy sort of flame burning on the south wall of the kitchen 4 or 5 feet up inside the kitchen door? A. Yes.

Q. And extending 2 or 3 feet? A. Well I could not say what size.

Q. It did not occupy the whole side of the wall? A. No just the holes.

Q. The fire seemed to be seeping out of these holes did it? A. Yes.

20 Q. And what did you do then with that fire? A. Put it out.

Q. Had you taken the chemical with you? A. Yes.

Q. And you put it out with the chemical? A. Yes, sir.

Q. And then what did you do? A. Went down the stairway, partially down the basement stairway.

Q. The fire that you speak of in the lane—going back to that. Did you operate on it before you went into the kitchen? A. Yes, that was put out, that was the first thing we put out.

Q. You did that with your chemical? A. Yes.

40 the steps towards the basement? A. Yes.

Q. About half way down would you say? A. About half way.

Q. And what attracted your attention when you got that fire out? A. We noticed fire under the stairway under the platform as you step through the door on the landing as you turned the landing, at the head of the stair.

Q. We will see Exhibit 4. Here is the corresponding place of the

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 14.

George
Williamson
Examina-
tion.

continued.

platform outside the kitchen door. You were going down the stairs and you were about half way down and you noticed the fire on which side of you? A. It was right here underneath this landing (indicating).

Q. And what sort of a fire was that? A. I could not tell you. It was right underneath.

Q. It was burning under the underside of that platform? A. Yes.

Q. And what did you do? Did you go right down to the bottom?
A. No, we came half way down.

Q. How did you get it out? A. With the chemical.

Q. And going down those basement steps, the basement steps are 10 not enclosed on both sides, are they? A. No, sir.

Q. They were enclosed on the left hand side, were they? A. Going down on the left hand side there seemed to be space between the steps and the wall. In other words, the steps did not extend the full distance across the opening.

Q. To the wall of the basement? A. Yes.

Q. It is unexcavated on the other side? A. There is a space between the steps and the brick wall that was covered with wood—a wooden cover.

Q. Well would the wooden cover form a part of the staircase or 20 would it be over on the wall? A. Well it is between the staircase and the wall.

Q. There was a thing that we will come to presently where you did break a piece of that down—"V" joint? A. Yes, lifted it off.

Q. But before you did that you had put out a fire with the chemical underneath the stairway platform? A. Yes.

Q. And that did not take you but a jiffy? A. That is all.

Q. And you did knock a piece of this wood off the left hand side of the stair? A. Yes, the left hand side. That lifted out. It seemed to look 30 as though it was fitted like a lid.

Q. And why did you do that? A. You could see fire down there.

Q. You could see through the cracks that there was fire. And you got this piece off and you saw the fire that was there more clearly then, did you? A. Well I don't know.

Q. Well where was that fire? Was it below the kitchen door? A. No, sir. It seemed to be directly underneath.

Q. Was that fire in the space between a brick wall and the stairway or was it underneath the kitchen floor? A. It was between the brick wall and the stairway.

Q. So it would be in this little space I have marked here with "X". 40 I will put a "X" with a circle around it. A. Yes.

Q. Immediately to the left of the stairway as you went down? A. Yes.

Q. And you pulled a piece out and there was fire there? A. Yes, sir.

Q. And what was the nature of that fire? A. I could not describe it.

Q. You put it out with the chemical? A. Yes.

Q. You were operating with the chemical during all this time? A. I may not have had the chemical myself but it was put out by the members of the department present.

Q. And the people who went in with you were Hobbs the driver and Constable the fireman? A. Yes.

Q. You three? A. Of course by this time there were more men at the back than the three of us.

10 Q. And what other firemen? Do you remember what firemen you saw first except Constable and Hobbs? A. You mean when I was working on the stairway steps?

Q. Yes. A. Campbell was one of the men.

Q. What did he do? A. He was working there.

Q. Did somebody come and get chemicals from you when you were working on that fire on the left side of the basement steps? A. Deputy Chief Hargrove called for the chemical at that time.

Q. And he had come from No. 2 station with you, not on the same conveyance but at the same time? A. Yes.

20 Q. He came in his own car or in the Deputy Chief's car or the Chief's car? A. Yes.

Q. And by this time he had called for the chemical? A. Yes.

Q. And where was he? A. He was inside the kitchen.

Q. And somebody came down and got the chemical? A. Yes, it was passed up to him.

Q. Do you remember whether that was Browning? A. No, I could not swear.

Q. It was some fireman who came down and got the chemical under the directions of the Chief or Assistant? A. Yes.

30 Q. And had you put the fire to the left of the stairway as you went down, out by the time you gave up the chemical, or do you remember? A. I don't remember but I believe it was put out by this time.

Q. And what was your next movement? A. We put out some fire underneath the floor of the kitchen.

Q. And that would be further west again than this fire that was immediately to the west of the stairway? A. Yes it would be right underneath the floor of the kitchen.

Q. More towards the front? A. Yes, sir.

40 Q. The floor of the kitchen was on what material? A. At that time I do not know what it was composed of but since then I made inquiries and I understand it was concrete.

Q. Now the kitchen of that hotel would be over this part marked "not excavated" on this basement plan. You observe that? A. Yes.

Q. But between the concrete floor of the kitchen and the non-excavated part—the ground—there was a space? A. Yes.

Q. Could you give me an idea how big that would be—how wide? A. No I could not tell. It was not a very big space.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 14.
George
Williamson
Examina-
tion.
continued.

Q. And there was fire burning under the kitchen floor in that space somewhere that you could see? A. Yes, sir.

At 12:30 Court adjourns till 2:00 p.m.

At 2:00 p.m. Court resumes.

Q. Just before lunch we got to the point in your evidence where you told us about seeing and operating on flames at a certain point near the kitchen and between there and the unexcavated ground. And you operated on them first with the chemical? A. Yes.

Q. And then after Deputy Chief Hargrove sent down for the chemical you got a hose line in and operated on that? A. A hose line was brought in about that time. 10

Q. But you put that fire out as far as you can judge? A. Yes.

Q. And trace your movements from there. Tell me what next you remember that you did. A. I went to the foot of the basement steps and I came from there up the stairs and after coming from there I noticed the coal chutes had been opened and flames were coming from these coal chutes.

Q. And before getting to the coal chutes you spoke of having gone down to the foot of the basement stairs? A. Yes.

Q. Did you notice any fire other than what you made out? A. No there was not fire at that time. 20

Q. And then you came up the basement stairs and out on to the lane? A. Yes.

Q. And you saw that these coal chutes—there were three marks on this basement plan, little circles in the middle a broken dot, squares, that are called chutes. Were there flames coming out of one or more than those? A. Out of two.

Q. The eastern two? A. No, it would be the two to the west.

Q. And coming up these steps out into the lane you saw the flames coming up through those coal chutes? A. Yes. 30

Q. And then what did you do? A. I came to the elevator shaft.

Q. That is marked "E" on this plan towards the east of the building, not at the east corner but towards the east? A. Yes, sir.

Q. And did you operate on that fire that you saw coming out of the coal chutes? A. No, sir. I came right up and over to the elevator.

Q. And what did you do at the elevator shaft? A. Went down the elevator to investigate.

Q. The elevator was a closed-in aperture was it. Did you get the elevator raised? A. Yes we had to raise the elevator.

Q. And then you went down into the place? A. Yes, put a ladder down. 40

Q. And the front part of that elevator—the part towards the basement was what sort of a door? A. It was a double door metal lined.

Q. And getting down then into this elevator place could you see through those double doors? A. Yes you could see between the two doors.

Q. And did you observe any flame? A. Yes, sir.

Q. What did you do? A. I came up the elevator then.

Q. And— A. And reported to the chief the conditions I found down there.

Q. The Chief who? A. Chief Dutton.

10 Q. And he had arrived at the fire by that time? A. He was there then, yes, sir.

Q. And then what did you do? A. Took a hose line down the ladder.

Q. With you, and anybody else? A. Campbell.

Q. And what did you do then? A. We opened the doors and endeavored to use our hose in an effort to put out that fire but it was too hot. The flames were coming out of there and we had to come back.

Q. You abandoned the attempt to put the hose on that fire because it was too hot? A. Yes, sir.

Q. And you and Campbell came up the ladder? A. Yes.

20 Q. Leaving the door open or shutting it? A. No, the door was partly open. We did not open it full wide.

Q. And after you came up what next in importance happened, in the importance of events that pinned themselves on your memory about this fire? A. It was only shortly after that when the floor fell in. That is the next thing that strikes me that I can remember.

Q. It was only shortly after and can you give us any approximation of elapsed time between the time you got up with Campbell out of that elevator shaft and the time that the floor fell in? A. Well I cannot give you any accurate time because working at a fire it is pretty hard to compute time.

30 Q. And the next thing you do remember that stands out in your memory is the floor falling in? A. Part of it.

Q. What part of it? A. Right at the rear wall. I cannot speak definitely as to the exact—

Q. Well the floor means? A. That is the first floor above the basement.

Q. Well the ceiling of the basement is that what you mean? A. Yes.

Q. And it fell in towards the back? A. Yes.

Q. And towards the east or west, according to your memory, first?

A. Well I don't remember.

40 Q. And did the whole of the floor fall in or only a portion of it? A. A portion of it fell in.

Q. And then when did No. 1 pump arrive—before or after that floor fell in? A. They would arrive to the best of my knowledge after that.

Q. After the floor fell in, is according to your construction of events?

A. Yes.

Q. And did you go down the elevator shaft again after No. 1 pump got there? A. Yes, sir.

Q. And who else this time? A. I don't remember who was down there that time. The line was already down there.

Q. And you and somebody that you cannot now remember went down the elevator shaft. And did you then get this hose playing on the basement? A. Just to a certain extent.

Q. And how long—can you give me any idea how long you were down there playing the hose in the basement? A. No I could not.

Q. You stayed there until you were ordered to come back—to retire? 10
A. I don't remember if I was ordered that time.

Q. But you did after some time but you don't remember just how long? A. Yes.

Q. You did come up with whoever was with you? A. Yes.

Q. Up the ladder of the elevator shaft and out on to the lane?
A. Yes, sir.

Q. And you fought the fire where after that? A. The events after that I cannot remember how they followed.

Q. You spoke of these flames that you saw on the south wall originally when you first arrived there with the combination. Did you see them 20
again that night? A. Yes, sir.

Q. Just tell us how often you saw them; not in numbers, but describe generally your experience of seeing these flames and of fighting them, if you did? A. Well the only way I can describe them is that periodically I would notice them.

Q. Periodically during the night? A. Yes, sir.

Q. And into the morning, during the time the fire was going?
A. Yes.

Q. And after the walls fell in? A. Yes, sir.

Q. These flames you describe as originally seen by you on the south 30
wall? A. Well flames similar to the ones I had seen. They would not be the same flames exactly.

Q. But flames similar to them? A. Yes.

Q. Were they in the same place or were they in other places along the south wall at that time? A. There were some flames at periods along the wall but just the location I cannot describe.

Q. And were they inside or outside or both? A. It was outside where I noticed them.

Q. In the same place you have originally described between where the wall was—the wall and the concrete pavement in the lane? A. Yes, 40
sir.

Q. And then did you see these flames periodically put out from time to time? A. Yes, sir.

Q. And did you see these flames periodically return after they had been put out from time to time? A. Yes, sir.

CROSS-EXAMINATION BY MR. SMITH.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 14.
George
Williamson
Cross-Ex-
amination

- Q. Who put those flames out? A. Which flames?
 Q. The ones you have been talking about? A. The firemen.
 Q. Who? A. I do not know who it was.
 Q. Mr. Woods said something and you said yes— What you mean is that you were from time to time at the back of this building and you observed flames along the back wall. That is what you mean? A. Yes, I mean I saw those flames and saw them put out.
 Q. Well you put them out once yourself. That is true? A. Outside?
 10 Q. Yes. A. No I did not say so.
 Q. Didn't you swear in this court house a few minutes ago you put them out? A. No. I swore they were put out.
 Q. Who did it? A. I don't remember who put them out.
 Q. There were only three men in your party and one was a driver. Now who put them out? A. Either one of them could have put them out.
 Q. Well who did? Do you know? A. No.
 Q. You didn't do it? A. No.
 Q. You didn't have the chemical hose at that time? A. No.
 Q. When you got to this building where did you first go?
 20 A. Through the basement door.
 Q. And when were those flames put out on the outside of the building? A. As soon as we arrived there.
 Q. What were you doing when whoever else it was put them out?
 A. Well I cannot say. We got off the waggon practically together.
 Q. Who got off the waggon together? A. The men riding on it.
 Q. Who were they? A. Constable, Hobbs and myself.
 Q. And which one put the flames out? A. I don't know which one put them out. But it is impossible for me to remember every move that was made at a fire.
 30 Q. You were there, and you cannot tell me who first put the flames out at that building? A. No, sir.
 Q. Now if I have followed you correctly. By the way, what color were they? A. Blue and orange.
 Q. And as I followed you you went inside then and you saw flames on the kitchen wall, that is the south wall. Am I right? A. Yes, sir.
 Q. What color were they? A. They were mostly an orange flame.
 Q. And you saw flames next between the stairway and the brick wall of the basement on the left hand side. That would be the west side as you were going down? A. I did not catch your question. Flames
 40 between where?
 Q. Between the stairway and the brick wall of the basement?
 A. No, the landing.
 Q. You saw flames under the landing? A. Yes, sir.
 Q. What color were they? A. They appeared an ordinary flame to me. I did not notice anything peculiar about them.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 14.
George
Williamson
Cross-Ex-
amination
continued.

Q. And you saw flames between the stairway and the basement wall? A. Yes, sir.

Q. That is when you took a piece of board out? A. Yes.

Q. Did anybody else take the boards off there that night? A. In that immediate place?

Q. Yes. A. Not that I remember of.

Q. Did anyone else take any boards off the west side of that stair-case? A. Not to my knowledge.

Q. And you were around there most of the evening. That is the part of the fire you were fighting? A. Yes, sir. 10

Q. And if anyone else had taken boards off no doubt you would have noticed it? A. No I would not say that.

Q. And what color were those flames? A. I don't remember what color they were.

Q. And then you saw some flames under the kitchen floor directly to the west? A. Yes.

Q. What color were they? A. Blue.

Q. Any orange in them? A. Yes.

Q. Then they were blue and orange? A. Yes.

Q. Now you made two statements with regard to this fire, one to Mr. Booth and Mr. Ward and one to your chief, Dutton, haven't you? Written statements? To Chief Dutton. You made one on the 31st of March. It may not have been to Chief Dutton. And one you made on the 22nd of February. And I am suggesting to you that this is the first time you have ever mentioned the color of orange. And I want to know why? A. I cannot give you any reason for it. 20

Q. THE COURT: Do I understand it is the first time you have ever mentioned orange? A. In the first statement that was made out it was made particularly.

Q. The question that was put involved a statement which I thought you assented to. I want to know definitely whether you do or not, whether today is the first time you have mentioned the color "orange" as relevant to these flames? A. I don't remember. That may be possible. 30

Q. You said on the 22nd February to Mr. Ward and Mr. Booth—you know those gentlemen? A. Yes.

Q. Mr. Booth is fire marshal? A. Yes.

Q. And who is Mr. Ward? A. One of the Provincial Investigators.

Q. You say "The fire alarm came in to No. 2 station at 9:11 p.m. . . . blue flames were coming up between the edge of the concrete pavement in the lane and the brick wall." Do you remember saying that? A. Yes, 40
sir.

Q. You will perhaps accept my word you do not mention "orange"? A. Yes.

Q. And you say: "The chemicals were played on these flames and they were put out but they broke out again later. There is no doubt in my mind they were gas flames. They were blue in color." Do you re-

member. Just read that, and you might tell me whether that correctly sets out what you told Mr. Booth and Mr. Ward? A. Yes, I guess it is.

Q. There is no doubt about it, is there? A. No.

Q. And you made a further statement on the 31st March which has been very kindly furnished me by your chief, Mr. Dutton, and you say: "On receiving the alarm drove to the rear of the Corona Hotel, found that a blue flame outside the wall between the kitchen door and the door which gives entrance to the stair and the kitchen which is a double door, this blue flame was about a foot high." Do you remember saying that?

10 A. Yes, sir.

Q. You accept it, that you did make that statement at that time?

A. Yes.

Q. Now I suppose since that time and this you have had a lot of discussion at the fire hall about gas flames, haven't you? A. Not necessarily, no.

Q. Oh never mind necessarily. Here is a great big building burns down and it has got abroad it is done by natural gas burning there and no doubt you firemen have discussed the Corona Hotel fire. Now, deny it if you like, but I would not if I were you. There is no doubt about that.

20 A. No. We have talked about it.

Q. There is no doubt whatever that after the 22nd February the Corona Hotel fire was the most useful and most interesting conversation you men had. There is no doubt about that, is there? Is there? A. No.

Q. And I suppose from that time you have had opinions from various experts, real or otherwise, upon the conduct of gas flames? A. No, sir. We have had no expert.

Q. Well gentlemen who may not be experts but who have had opinions. You have heard opinions about it? A. Nobody ever gave me any opinion on it.

30 Q. Do you want to swear in this Court that you have had no conversations as to the color of gas flames since the Corona Hotel burned down? A. We have had conversations, sure.

Q. About the color of gas flames? A. I don't remember any particular conversation about it.

Q. Did you? A. Not that I remember of. We have talked naturally about gas.

Q. Do you want to swear to the contrary that you have not discussed the color of gas flames since then? A. No, sir.

Q. You have, haven't you? A. No, sir.

40 Q. It is the most natural and logical thing for you to do, isn't it? A. Yes.

Q. And you no doubt learned then that a blue flame is where gas is burning at its best point of combustion, didn't you? You have learned that? A. Yes, I have heard that.

Q. So that when you found these blue flames burning between the pavement and that brick wall with an insufficient supply of air you had

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 14.

George
Williamson
Cross-Ex-
amination
continued.

to get another color into them, hadn't you? A. I am only explaining it to you as I saw it.

Q. I am saying that with the information you learned about the combustion of gas combined with air you have learned that your blue flame is when you have an absolutely proper mixture of air and gas. You have learned that? A. Yes.

Q. And I say to you therefore, that you have to leave this blue business and flames and get another color into them? A. No, sir.

Q. Then why didn't you mention this orange color before? Why didn't you? On two occasions when you delivered written statements, 10 why didn't you? A. I don't know why.

Q. Now supposing we take a tube of natural gas as supplied in this city and we simply light a match to that at the end of the tube without introducing air into that tube, what color is it? A. I don't know. I never tried it.

Q. And yet you venture an opinion from the color of a flame that it is natural gas and you do not know what color natural gas burns in when it is unmixed with air? A. Well there is nothing else there to burn.

Q. Is that your reason? A. Well it appeared to be nothing else to 20 me.

Q. And the reason you come to the conclusion these were natural gas flames was not because of their color but because you could not see anything else there to burn? A. Well combined, I am right.

Q. I suggest to you that the reason you came to the conclusion that these were gas flames, that is natural gas flames, was because you saw nothing there to burn and you were not influenced by their color. Is that a correct statement or is it not? A. I don't quite get it.

Q. I say this to you, take your time and do not hurry about this thing. You saw flames burning at the back of this hotel? A. Yes. 30

Q. Between the pavement and the brick wall? A. Yes.

Q. Save a space of ground near the doorway? A. Yes.

Q. They were a foot high? A. Yes.

Q. And which in March you said were blue? A. Yes.

Q. And which in February you said were blue? A. Yes.

Q. And which you now say were blue and orange? A. Yes.

Q. And you came to the conclusion that they were gas flames? A. Yes.

Q. And the reason you came to that conclusion was not on account of their color but because there was nothing else there that you could 40 see which was inflammable? A. The two reasons combined was the reason for forming that opinion.

Q. Which was it that brought you to that opinion—the blue color or the blue and orange color? Which? What colors influenced you at the time that you came to that opinion? A. The blue color.

Q. And when you made your statement on February 22nd that you were sure they were gas flames, you were influenced only by the fact that they were blue in color? A. Yes.

Q. And if it turns out they were not blue in color you would rather change your mind? A. No, sir, I would swear to it only as I saw it. I am speaking of the flames as I remember them.

10 Q. But I am saying to you that if you relied on the color to form the conclusion they were gas flames and they were not in fact that color you might change your mind as to what kind of flames they were? A. Yes.

Q. Thanks very much. And the next fire you saw, if I follow you correctly, was under the platform of the stairway. You went into the kitchen? A. Yes.

Q. Those were the flames burning from two places where the plaster was off the wall? A. Yes.

Q. And the laths were exposed? A. Yes.

Q. And those were the two flames, and I suppose you put them out in just a second? A. Yes, sir.

Q. Were you back in that kitchen again? A. Later I was.

20 Q. About how much later? A. Well I can't tell.

Q. Was there any fire in the kitchen when you were back there again? A. Not there, no, sir.

Q. Not at that place? A. No, sir.

Q. And so far as you were concerned those two holes in the kitchen wall had not re-lighted so far as you personally know. You just told me they were not lighted when you went back again. And as far as you know personally they were not re-lighted at those spots? A. Do you mean the two holes that were in the wall?

Q. The south wall, yes. A. I don't know, I could not say that.

30 Q. I mean so far as you know they were not re-lighted. You did not see them again burning? A. No, sir.

Q. That is correct, is it not? A. Yes.

Q. And was there anything peculiar about the color of those? A. No, sir.

Q. Orange and blue, I suppose? A. No, I did not say so.

Q. What color were they? A. Just looked like an ordinary fire to me.

Q. What is that? Is that orange? A. That would be an orange color.

40 Q. So we have the orange and blue outside and the orange in the kitchen. And that is the normal color of most kinds of fire. That is what you mean? A. Yes, sir.

Q. Now we will leave the orange and go down the stairway. You go down to the kitchen and you found a fire underneath the platform of the stairway? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 14.
George
Williamson
Cross-Ex-
amination
continued.

Q. And that is of wooden construction? A. Yes.

Q. Any suggestion about that fire being a gas fire? A. No, I have no suggestion.

Q. And you found a fire burning under the floor of the kitchen. Wooden construction again? A. The floor?

Q. Yes. I mean there are wooden joists and wooden construction in there? A. I don't know if there was.

Q. So you don't know what was burning under there? A. No, sir.

Q. You have not got an idea about it, have you? If you think it was gas now, let us have it. I want the worst of this story from you. A. I am only endeavoring to tell you to the best of my knowledge what actually occurred. 10

Q. I agree with you. Do not misunderstand me. I have a job of work to do and so have you.

MR. WOODS: I have experienced this difficulty with firemen who have come to give evidence—they are reluctant to do so because of the very thing Captain Williamson is subjected to now, and my friend may be in that position some time.

MR. SMITH: When I get through with Captain Williamson he will be a better friend of mine than yours. 20

Q. I am speaking of this next fire and what I want to know is if there was anything suspicious about it in your mind under the floorway in the kitchen. A. The only thing peculiar was some were put out and they lighted up again.

Q. Did you put that one out under the kitchen floor? A. Yes.

Q. When did you put it out the second time? A. Well I don't mean to say I actually handled the hose but it was put out when the larger hose was brought down. It was also put out then.

Q. And were you there when it was put out the second time? A. Yes. 30

Q. Where were you when it was put out the second time? A. Coming back up the stairway.

Q. Is it an unusual thing in fires for fires to re-light in places? Is that unusual? A. To light so rapidly.

Q. Well how rapidly? A. Well it was put out. There only seemed to be a small amount of fire in there. It was put out and it was just a matter of a very short space of time when it was lit again.

Q. Your statement was there only seemed to be a small amount of fire in there? A. Yes.

Q. And you did not put it all out. Would not that be the logical explanation? A. Well if it kept burning. 40

Q. Well suppose it was at the back of a beam. That floor was not one big vacant space? A. Well it may be.

MR. WOODS: Do you know whether it is or not?

MR. SMITH: I do not know anything. It is the witness who spoke. Do you know whether it was one open space and you could see all over?
A. No.

Q. Just, as I take it, like most things supported on beams, there might have been some of that fire not visible to you? A. Yes.

Q. And if you went there again and saw a fire it would be logical to say that you did not put that fire out. That would be logical? A. Yes.

10 Q. And now I move on to the place where you saw the fire— As I understand you, after putting out the fire in the kitchen wall you went down to the basement? A. Yes.

Q. And you saw no fire from that point? A. No.

Q. And did you go upstairs to the front part of the building? A. No, went out to the lane.

Q. What route did you take to do that? A. It was only a matter of feet across the lane.

Q. There is an opening from the outside? A. Yes, sir.

Q. And you raised the elevator above you and you went down that shaft? A. Yes, sir.

20 Q. What for? A. Went down to investigate it to find to what extent the fire was.

Q. And you had just been at the bottom of the basement stairs? A. Yes.

Q. And there was no fire in that basement that you could see at that time. That is true? A. That is true.

Q. Could you have gone from there to the elevator, couldn't you have done that, to investigate where the fire was? There was a clear passage right around there to the elevator? A. I don't know how clear it is.

30 Q. Well all I know about it is I heard Christie say he walked from the vicinity of this elevator towards these stairs and out up the stairs to the kitchen. There was nothing in your way? A. To the elevator.

Q. From the basement floor he walked to the stairway and went up the stairway and out to the back lane. And if he did that I cannot see how you cannot reverse his route? A. Well if there was fire there, I don't know.

Q. Well he is a wonder, you know. He went through 30 feet of it. But you saw no fire at the foot of the basement steps? A. No.

40 Q. And you can see those coal chutes from the foot of the basement steps? Here are the basement steps and those pencilled marks on this Exhibit 4 are the coal. Am I correct in assuming that on Exhibit 4 these three things with the circles on them are the coal chutes?

MR. WOODS: He gave evidence he came up the steps and out to the lane and passed along the lane and there was fire coming out of these two western coal chutes. He went along the lane to the elevator shaft

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 14.

George
Williamson
Cross-Ex-
amination
continued.

and down the elevator shaft. That is what he said. He said when he went to the foot of the basement steps that he did not see any fire in the basement from that point.

MR. SMITH: You will observe that when you are at the foot of the basement steps you are looking at that western coal chute? A. Yes.

Q. And that fire in the coal chute, do you think it took place while you were in there?

MR. WOODS: The coal chute is outside.

Q. MR. SMITH: I am speaking of the inside. He was looking directly at the westerly coal chute. And you did not observe any fire there? A. No. 10

Q. And you went directly upstairs and walked a few feet along there and there was fire in it at that time? A. There was fire in it.

Q. Was coal burning there? A. I don't know what was burning.

Q. What color were the flames? A. Just ordinary flames.

Q. Lots of smoke? A. Quite a bit of smoke.

Q. We have heard there was coal in there. Do you think it was coal that was burning? A. I could not say.

Q. And were those fires in the coal chutes attacked from the outside? A. Yes, I believe they were.

Q. And you also went down to endeavor to attack them from the elevator shaft? A. Yes. 20

Q. You went into the elevator shaft, put a ladder down, and opened the doors with a view to attacking those fires? A. Yes.

Q. But you found the heat too strong and had to withdraw, as I understand you? A. Yes.

Q. You observed that wall? A. Yes.

Q. Over here is your elevator shaft? A. Yes.

Q. How are you going to attack that fire from this elevator shaft? A. Well the fire was right here.

Q. You mean the fire was in the easterly coal chutes and not the west one? A. Well I said these two westerly coal chutes, the flames were coming from and I also said when we went here to the door we saw flames but I could not say they were from the chutes. 30

Q. Well you mean it was a fire in that direction. You could not see that coal chute from the door. Thank you. I think I see your point. Now, I imagine you stayed at the fire that night, or the most of the night? A. Yes.

Q. And I want to know when No. 1 pump got there. You said to Mr. Woods that it was after the floor fell in. That is right? A. At least when they went down the floor had fallen. When No. 1 arrived there with the air line hose the floor had fallen right at the elevator door. 40

Q. The floor had fallen in before No. 1 pump got there? A. Yes.

Q. And what station did that pump come from? A. No. 2 station—the same station.

Q. The same station as your own? A. Yes.

Q. See if we can find out when that floor really did go down. There is no doubt in your mind that that was the time that No. 1 pump came. A. About that time, yes.

Q. And you say it did not come until after the floor went down? A. Yes.

Q. And you can change that if your want to. It is your own business. 10 That is what you said? A. I can judge the time in this way, when No. 1 came one of the lines they strung went to the elevator shaft and at that time the floor had fallen through. That is about the only way I can arrive at the time.

Q. I am not speaking of the time by the hour. All I want definitely from you is this, that that No. 1 pump did not get there until that floor had fallen in. Can we agree on that? A. Yes.

Q. Now I want to ask you one more question. There is a company there called the Motor Car Supply Company in that same building? A. Yes, sir.

20 Q. It was burned up with the rest of the Corona Hotel property? A. Yes, sir.

Q. Now I want you to tell me if to your knowledge a single fireman entered the basement of the Motor Car Supply Company? A. I could not answer that.

Q. You did not? A. No, sir.

Q. And you do not know anyone else who did? A. No, sir.

MR. WOODS: Will you describe what you mean by the basement of the Motor Car Supply Company?

30 MR. SMITH: I mean that portion of the building lying underneath the main floor. Is there any misunderstanding between us? If there is let us straighten it out. I mean the basement where they kept their goods which had been excavated and therefore became a basement—a cellar. You will observe in the plan? A. It says here "not excavated."

Q. But this is their basement.

Q. MR. WOODS: What is their basement? Did you see anybody go—did you or did any other fireman get into the basement of the Motor Car Supply Company that night to your knowledge? A. I have no knowledge of that, no.

40 Q. MR. SMITH: Now under whose command were you there that evening? A. I was under the Chief and his deputies.

Q. My understanding is this, I take it that you were in charge of your combination? A. Yes.

Q. And then the deputy or district chief, Chief Hargrove? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 14.
George
Williamson
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 14.

George
Williamson
Cross-Ex-
amination
continued.

Q. And then later Chief Dutton came? A. Yes.

Q. You were in command of the first small unit? A. Yes.

Q. And then Hargrove and then Chief Dutton? A. Yes.

Q. Now I want to know if you worked at any other part of the building during the fire other than the part which you have described to Mr. Woods and myself? A. No, sir.

MR. WOODS: Had you ever been in this basement before? A. No, sir.

Q. You were not familiar with the basement? A. No, sir.

Q. Did you know where the elevator shaft was in the basement. 10
When you were down at the foot of the basement steps were you familiar enough with that basement to know where the elevator shaft was at that time? A. No, sir.

Q. Was there smoke in the basement when you were at the foot of the basement steps? A. Yes.

Q. Much or little? How would you describe it? Was the basement smoky? A. I just do not remember to what extent the smoke was at that time.

No. 15

Evidence of Robert Semple.

20

No. 15.
Robert
Semple,
Examina-
tion.

ROBERT SEMPLE being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. You work in the Corona Hotel? A. Yes.

Q. And what position did you have there? A. At that time fireman.

Q. Day fireman? A. Yes.

Q. And on the day of the 21st February 1932 you had been in attendance? A. On the Sunday?

Q. Yes, on the Sunday. A. Yes I was there.

Q. You had been there on the Sunday attending to your duties as 30
fireman at the Corona Hotel? A. Yes.

Q. And you ceased your duties at what time on the Sunday?
A. Eight o'clock officially a minute or two after that.

Q. And what did you do just before you left with regard to your boiler fires and other fires? A. Well I just fixed them up and saw that everything was clean and shut the elevator doors. The last thing I did do was to shut the elevator doors and locked them with a lever. Then I stood on the basement stair about two steps up and looked around there and left.

Q. Now before you shut the elevator doors you attended, I have no 40
doubt, to your fires? A. Yes.

Q. And the fires are the boiler fires are they? A. Two boiler fires and one jacket hot water heater.

Q. And the boiler fires. Let us understand about them. There are two boilers? A. Yes.

Q. The hotel is heated by steam? A. Steam heat.

Q. And the steam is in those boilers and there is a fire under the boilers is there? A. Surely.

10 Q. And when you say you attended to these boiler fires what did you actually do in connection with the boiler fires and what did you do with the doors and the dampers. Just tell me. A. I threw on coal, I left the dampers as they were, full open.

Q. The dampers are the dampers in the door or in the pipe? A. Well not in the pipe. There is the bottom damper under the ash pit. Then there are air holes in the doors, in the fire doors. There is an arrangement you can let air in on top of the fire.

Q. One of these little apertures you turn on and off, a "V" shaped thing? A. Yes, different shapes.

Q. And when I say turn them on I mean open. Did you turn them? A. No, it was not necessary to touch them.

20 Q. How were they when you left? A. Well I don't know. They may be shut, they may be open, they may be half and half.

MR. SMITH: And you may summarize it he does not know.

Q. MR. WOODS: And the furnace door was shut? A. Surely.

Q. And then there is a bottom door to where you take the ashes out? A. Yes.

Q. Was it shut? A. I don't remember.

Q. The coal you put on these boilers was what sort of coal? A. Nut as far as I can remember.

30 A. Yes. Q. You did there what you have done every night I suppose?

Q. And then you saw to the fire in the jacket heater? A. Yes.

Q. Describe to me what the jacket heater is and where it is with relation to the boilers? A. That is on the east side of the boilers about six feet to the south.

Q. And what is it? Is it a round stove? A. Just a stove, a casing around it with the hot water in between and tubes through it.

Q. And that is to heat the hot water? A. Yes.

Q. And the steam tubes are through this? A. No; hot water. There is no steam in it.

40 Q. And how is that fire? Or what fire is there in it? A. Coal.

Q. Nut coal? A. No, we call it stove coal or egg coal.

Q. And where is it put—in the pot of the jacket heater? A. On the fire bars.

Q. And then there is a door through which you put that coal? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 15.

Robert
Semple,
Examina-
tion.

continued.

Q. And was that door shut or open when you left? A. Shut.
Q. Is there a little draft aperture such as you mentioned in that door
too? A. Yes.

Q. Do you remember whether it was shut or open when you left?
A. I don't remember.

Q. Now there is that what we have been calling or some people have
called the garbage burner? A. Yes.

Q. Is that apparatus the thing you burn the garbage in? A. Yes.

Q. Now had you burned any garbage that night? A. No.

Q. Where was the garbage? A. Well as far as I am aware it must 10
have been near the elevator at the back.

Q. And did you notice whether the garbage—I suppose it is held in
a can? A. A box on wheels.

Q. And did you notice whether it had garbage in it when you left?
A. Never gave it a thought. There must have been, I think. How much,
I don't know.

Q. Was it a wooden box? A. A wooden box.

Q. Now are you familiar with the way in which the steam pipe runs
up through the basement to the radiator in the private dining room—the
small room at the back? A. We called it a banquet room at the back. 20
Well I am not exactly sure.

Q. You are not exactly sure. Is that your answer? A. I could not
swear to anything but I have a good idea.

Q. Well what is your good idea?

MR. SMITH: Oh no my Lord. I object to any question being asked
in that form. This is apparently of some importance. Surely it can be
established by someone who has more than an idea.

THE COURT: I suppose Mr. Woods' intention was to exhaust the
witness's memory. The method of doing it of course may not be quite 30
right.

MR. WOODS: I just want you to give us if you can any information
that you know as accurate that would place for us the steam pipe run-
ning up to the radiator in what you call the banquet room?

MR. SMITH: And if I may make myself plain, this man's answer
was to his own counsel, he would not swear where the pipe was. And that
being so he should not be permitted to go further and do some estimating
or guessing. It is something of importance. It is something which can
be, I suppose, established accurately and it is a waste of time to try to
have it done in any other way.

THE WITNESS: I can swear the pipe was through the wall but I 40
think, did you mean could I trace where it came from?

Q. MR. WOODS: Do you know anything about that pipe so far as

the location of any pipe in the basement was concerned? A. I know where it goes through the floor into the banqueting room.

Q. Now tell us where the pipe was with reference to the basement plan Exhibit 5. Here is the layout of the basement if you super-impose the one on the other—we had better do it in the right order. We will put the ground floor on top of the basement floor. Now the place we are speaking of, if you let me write on this, is this room here which you call the banquet room and I call the private dining room “private D.R.” Now there is the basement plan and we had better super-impose it as accurately as possible, and there is the private landing. Now will you, speaking first from the basement, tell me where that steam pipe goes up to the radiator in the private dining room? A. Somewhere there (indicating).

Q. Somewhere at a place we will mark with an “X”—a Greek X I think it is. Now let us get it in the dining room. Now that does come right up to a radiator above it? A. Yes, on the east side—no, the west side.

Q. The pipe enters the west side of the radiator in the private dining room and it is about the position where I put an “X” on the basement floor plan? A. Yes.

20 Q. Approximately there? A. Yes.

Q. And how big is that steam pipe that runs down at that place? A. An inch and a quarter I think it is.

Q. And it runs down what wall of the building? A. It stops after it gets to the radiator.

Q. I know. But here is the south wall of the building. Is it right against the south wall going up. A. Yes, right through the floor.

Q. And it is quite close to the south wall, is it? A. After it leaves the south wall I am not exactly sure where it goes.

Q. But by reference to the south wall itself? A. Oh yes.

30 Q. It is quite close to it? A. Almost up against it.

Q. Now you are familiar with these bins that contain the coal and coke? A. Yes.

Q. And behind each and above each of those bins would this pipe run? A. It probably run through two of them. Maybe it run over the top.

MR. SMITH: There we are, my Lord. “Probably” this.

THE COURT: You will have to give evidence only of what you know.

40 MR. WOODS: I think if we can get an explanation of the word “probably.” It is probably what he knows but he is expressing himself in that way.

THE COURT: Well if he can give the evidence give it. What do you mean by “probably?” A. I won’t swear to it because I am not exactly sure of it.

*In the
Supreme
Court of
Alberta*

Plaintiffs’
Evidence

No. 15.

Robert
Semple,
Examina-
tion.

continued.

THE COURT: Then you had better not say it at all. What occurred previously, it shows of course the value of the rule I have tried to express. The witness did have some information and counsel apparently knew he had and there was some misunderstanding.

MR. WOODS: Well I did not know what information he had accurately. I supposed he had more information because he appeared to be an intelligent observant man.

Q. Was there an old air ventilator in the neighborhood of that building? A. Yes.

Q. Give me an idea where it was on the basement plan. That is 10
at that place where there is a note marked on this basement plan Exhibit 4 marked as the two coal chutes, but which you say is a disused ventilator? A. Yes.

Q. You have been in the employ of that hotel how many years?
A. Since 1926.

Q. And you are aware of the fact that this was at one time a ventilator? A. Yes, but it was never used while I was there, as a ventilator.

Q. And the manhole of the ventilator was where? A. On the back lane.

Q. And then how far from that disused ventilator or the manhole 20
of that disused ventilator in the back lane was the east end of the coke bin, that is the three of the bins going eastward? A. Probably about seven feet. About seven feet.

Q. And this is inside the basement next to the coke bin going west of what? A. A place for stove coal.

Q. Was there a covering over the coke bin? A. Yes. There was a ceiling there.

Q. On the bin itself? A. Yes.

Q. Was there an open place towards the east or a closed place of the coke bin facing the elevator shaft? A. Well it was all open. 30

Q. And the next, the coal bin next door to it, did it have a ceiling over it? A. No, the basement ceiling was over it.

Q. But where was the—was there any ceiling over either of these coal bins that you can remember. A. Not unless you count the basement ceiling.

Q. I am speaking of the ceiling, of the construction itself. A. Yes.

Q. How far would the place be between the top of these bins? I suppose they are all about the same height, are they? A. Except the coke bin. That is a little lower because of the ceiling.

Q. Well take the coal bin. How far—what space would there be 40
between the coal bin, the centre one, and the ceiling? A. From the floor to the ceiling?

Q. No, from the top of the most easterly coal bin to the ceiling. What space would there be there? A. I don't understand you.

Q. How high were the two coal bins? A. They were as high as the basement.

Q. Did they go right up to the ceiling of the basement? A. Yes.

Q. Let us get your memory direct on that. They are wooden bins?
A. Yes.

Q. Three bins? A. Sure.

Q. Made of what—just boards? A. Yes.

Q. With apertures to put the coal in. Is that right? Now when you go to the top of those is there or is there not any space between the top of those and the ceiling? A. These are not really bins in the sense you mean. They are built up to the ceiling—these two.

Q. But the coke bin? A. Is built more like a box.

Q. THE COURT: The others are more like rooms with partitions?
A. Yes.

Q. MR. WOODS: The coke bin, on the other hand, had a ceiling over it. It was more like a box? A. Yes—two walls and the ceiling.

Q. And the east end of it was open? A. Yes.

Q. There was no side to it toward the elevator? A. No.

Q. And can you give me any idea of how far it would be between the top of the coke bin, what we call the ceiling of the coke bin, and the ceiling of the basement? A. Approximately nine inches. I never did measure it. I never needed to go there.

MR. SMITH: He said that the east end of the bin was open. I think he was wrong.

MR. WOODS: No. The east end of the coke bin, the one that faces the elevator shaft. That, I understand was open. The north side was boarded except there was an aperture? A. Yes.

Q. There was an aperture to take out the coal? A. Yes.

Q. The coal came in through the chutes. A. Yes.

Q. And was taken out through an aperture or door that was to the north side? A. There was no door on the east side of the coke bin.

Q. But there would be doors on the two coal bins? A. Yes.

Q. But there is no door on the north side of the coke bin because you took the coke out of the east side which was open? A. Yes.

CROSS-EXAMINATION BY MR. SMITH.

Q. You smoke, don't you? A. Yes, I do.

Q. I suppose when you left that place that evening you lit your pipe in the usual way and went upstairs and on home? A. I can't say I did not, but I don't remember.

Q. Well that is your usual practice, isn't it? A. Not necessarily, it all depends.

Q. You acknowledge you smoke? A. Sometimes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 15.

Robert
Semple,
Examina-
tion.
continued.

Cross-Ex-
amination

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 15.

Robert
Semple,
Cross-Ex-
amination
continued.

Q. And there is no rule against it? A. Yes.

Q. And you have lit your pipe at various places in the basement?
A. No doubt about that.

Q. And there is no doubt about it that just before you went home in the neighborhood of eight o'clock you walked roughly from the elevator shaft to the basement stairs and so on up. A. Yes.

Q. And you stood on the basement stairs and you stood there for a moment and looked around? A. Yes.

Q. And all was peaceful in the Corona basement at that moment?
A. Yes. 10

Q. There was no hissing sound? A. Not that I am aware of.

Q. You walked from the elevator shaft to the basement stairs and you did not hear a hissing sound? A. No.

Q. And you stood still on the second step for a moment or two and looked over your domain and you heard no hissing sound at that time?
A. No.

Q. So I think we may safely conclude there was no sound at that time? A. I don't suppose there was.

Q. How much steam did you have on in your boiler when you left?
A. I don't know. 20

Q. Well it was quite a cold day and there is no doubt there was steam up in the hotel that afternoon? A. Yes.

Q. You were working your boilers pretty hard and you had plenty of steam on when you left? A. Perhaps about two pounds.

Q. What do you run now? A. Well it varies.

Q. In cold weather? A. It varies.

Q. Well what is usual? It varies between what and what? A. It all depends on how often it is attended to. The steam rises and falls.

Q. I know that. But when the weather is as cold as it was on Sunday we try to keep heat in all our radiators most of the time? A. Yes. 30

Q. And there is no doubt that is what you were doing that day?
A. That is true.

Q. And you were stoking your furnace in a way that you would maintain heat in all radiators. I understand the hotel was practically full of guests that day? A. Yes.

Q. And you would not have any places shut off? A. No.

Q. And you were working your plant up near the capacity? A. It depends on how the boilers were.

Q. Well the capacity of the boilers as they were? A. The capacity of the boilers would do for a bigger building than the old Corona. 40

Q. But for the shape they were in you were doing your best with them? A. Yes.

Q. And you had some steam pressure on? A. Yes.

Q. And if there were a hole in a steam pipe you would hear it, wouldn't you? A. Yes if it was in a pipe.

Q. If there were a break in the pipe that leads up to this dining room or, as my friend prefers to call it, the private dining room? A. Yes.

Q. Now you were back to the building again that evening, were you, at the fire? A. Yes.

Q. About what time? A. About ten o'clock.

Q. Now the duty of burning garbage was the duty of Christie? A. Yes.

Q. And it was brought down this elevator shaft in this box on wheels and was burned in the garbage burner? A. It was burned in the garbage burner.

Q. You have a bed of coals which keeps your water hot at all times? A. Yes.

Q. And the other fuel for heating your water was garbage? A. No. The garbage was burned to do away with it, not for heating.

Q. And did you have a separate box for your garbage? A. Yes we had another crate.

Q. And it was burned up above the coal fire? A. Yes.

Q. And had you ever burned garbage there? A. Yes, I think so.

Q. Are you a fireman of some experience? A. Yes.

Q. There is no question at all that the burning of certain kinds of garbage creates gas? A. Yes, sure, in burning anything.

Q. But I am saying that in burning garbage there is no doubt that it has gas as a product? There is no doubt about that? A. There is smoke and gas. It all depends how you look at it.

Q. I thought you said a moment ago that you said you knew the burning of some kinds of garbage created some kind of gas?

THE COURT: I think the witness's answer to that was "Sure."

Q. MR. SMITH: You were examined in this case for discovery as an employee of this hotel, weren't you. You gave evidence before the clerk. You remember that? A. Yes.

Q. And to get the thing clear, there is no doubt before you went out that evening you were right to the far door of the elevator? A. Yes.

Q. And as you told Mr. Martland, you said you would very likely light your pipe as you went out but you were not sure. That is your position today? A. I said it was possible or probable. I don't know.

Q. Well reading from page 21. "Are you a pretty steady smoker?" "A. I would very likely light my pipe as I went out, but I am not sure." That pretty accurately sets up the situation? A. Yes.

Q. And the time of leaving there was about 8:10? A. 8:10.

Q. And at 8:10 there was no hissing sound? A. Not that I heard of.

Q. How is your hearing? A. Good.

Q. And to clarify it again it was just before you went out that you were around by this elevator shaft and walked across to the basement steps? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 15.

Robert
Semple,
Cross-Ex-
amination
continued.

No. 16.

Evidence of George Constable,

GEORGE CONSTABLE being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. You came to the Corona fire on the combination truck, did you?

A. Yes, that is right.

Q. Along with Captain Williamson and driver Hobbs? A. Yes.

Q. Now when the truck pulled up behind the Corona building it came into the lane, didn't it? A. Yes. 10

Q. What was the first thing you noticed about the fire? A. Well, I noticed blue flames along the bottom of the base of the wall, between the pavement and the lane. There were flames about eight or ten inches high.

Q. And what happened to those blue flames? A. Well we put them out with a chemical line.

Q. Mr. Smith has been asking Captain Williamson who it was put the chemical on. Do you remember? Was it you or Hobbs or Williamson? A. I believe it was me.

Q. You took the hose of the chemical down and put them out? A. Yes. 20

Q. You did put them right out? A. Yes right out.

Q. Did you ever see them again? A. Well not immediately afterwards, but later on in the evening.

Q. How long after that was it that you saw flames in the same place as that? A. Oh I could not say exactly but somewhere around an hour afterwards maybe.

Q. And whereabouts were these flames that you first saw between the cement pavement and the south wall of the building with relation, for instance, to the basement door? A. Well they extended about fifteen or twenty feet west of the basement doorway and a few feet east of the door- 30 way. That was the basement door.

Q. And what did you do then after putting those flames out? A. Well Williamson in the meantime had gone into the basement and I passed the chemical down to him then.

Q. What flames, if any, did you notice when you went into the building? A. Well there were flames to the left when I went into the basement.

Q. And you went down the basement steps? A. No, I went just on that little landing.

Q. And you handed him the chemical down? A. Yes. 40

Q. And you noticed flames to the left of the staircase? A. Yes.

Q. As you stood on that little landing? A. Yes.

Q. And did Williamson put the chemical on those flames? A. Yes I believe he did.

THE COURT: Well "I believe." If the question is at all important it really does not convey very much, does it?

Q. MR. WOODS: I am going to see what he means by that. I think your Lordship may trust me to exhaust his memory on that. Did you see him do it? Why do you say you believe he did? A. Well it is hard to say who did it. It might have been me and it might have been him.

Q. But did you see those flames put out? A. Yes they were put out.

Q. Then where did you go or what next did you do in connection with the fire? A. Well Captain Williamson told me to go back with the combination and string a line from the pump, that was a big line. The first line we had was just a small chemical line. And he told me to go and string a big line from No. two's pump, which was on Jasper.

Q. No. 2 pump had come to the fire? A. Yes.

Q. Leaving just after you? A. Yes, about the same time.

Q. And it would be at the nearest hydrant you expected by the time Captain Williamson gave you this direction? A. Yes.

Q. And the hydrant was where? A. At the corner of 106th and Jasper.

Q. On the northwest corner? A. Yes on the northwest corner.

Q. And it is to that hydrant that—A. That I strung that line from.

20 Q. So you went back from the position you have described along the lane up to the corner of 106th and Jasper, attached this larger hose on to the hydrant from No. two's pump? A. Yes.

Q. And brought the hose along to the lane? A. Yes.

Q. Strung it along the lane, did you? A. Yes to the back of the building.

Q. And you had to tighten the couplings as you went along on that hose? A. Yes.

30 Q. And then the next thing you did in connection with the fire was what Mr. Constable—A. Well the next thing I done when I got back, was to help some of the other fellows on the nozzles.

Q. I want to get an idea of how long this is when you got to the fire. I am tracing your movements. Did you help Browning and Lockie? A. Well it is hard to say who it was. There was a lot of smoke there, you know.

Q. Did you play any water on the coal chutes when you came back after you had got the hose laid? A. Yes.

Q. And if you can give me any idea I would like you to do so. I gather that after being occupied in this way you went down to the basement again. Is that right? A. No.

40 Q. Did you go to the basement? A. No I did not go to the basement at all.

Q. Well did you start to go to the basement? A. I started to go.

Q. And why didn't you go? A. Because I could not get down there.

Q. Well why couldn't you get down there? A. Because there was too much fire down there.

Q. Now that means you started to go down the basement steps the same way you had gone before? A. Yes.

Q. Now can you give me any information—any fairly accurate information of how long it would be after you left that basement door to go to the hydrant at the corner of 106th Street and do all these things you have been telling me about, that you tried to get down the basement again but could not because there was so much fire? Could you give me any idea of how much lapsed time there would be? A. No I could not.

Q. And then you went and did what, when you could not get down to the basement? A. Well I played water into the basement coal holes 10 there.

Q. The chutes, you mean? A. The coal chutes, yes.

Q. And also the windows at the back? The back windows of the hotel? A. Yes.

Q. And you spoke about these blue flames being seen and I think you told me that it was about an hour after you first saw them that you saw them again? A. Yes, roughly.

Q. And did you put them out yourself or did you see them put out again? A. Well I saw them put out.

Q. And did you see them re-light again during the night? A. Yes. 20

Q. Can you give us any general idea of how often that happened? A. Well I could not.

Q. Well was it many times? A. Yes quite a few times.

Q. And you remember that there was a wall—a south wall of the building or a portion of the south wall and portion of the east wall fell in some time during the fire or one fell in and one fell out. Do you remember that? A. Yes.

Q. Can you tell me whether those flames that you have said were put out and reappeared, appeared inside the walls as well as outside the walls, or do you remember anything about it? A. Well I noticed them 30 after that wall fell down that the east wall you have spoken of. I do not say that I noticed them inside before then.

Q. But did you notice them inside then? A. Yes.

Q. You noticed them inside as well as outside after the east part of the south wall had fallen in? A. Yes.

Q. Were you there at that fire until quite early in the morning? A. Yes.

Q. About what time was it? A. Ten minutes to eight in the morning when I left.

Q. Could you give the Court any information about what hour it was that you last saw these flames, whether inside the wall or outside the wall? A. No I could not give any time. 40

Q. Could you give any approximate idea of how long it was before you left the fire that you last saw the flames? A. They were burning inside when I left the fire.

Q. Inside when you left the fire? A. Yes.

CROSS-EXAMINATION BY MR. SMITH.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 16.

George
Constable,
Cross-Ex-
amination

Q. I want to be clear on one thing and no doubt about it at all. You left there at eight o'clock. A. Yes.

Q. And these same flames you saw burning during the evening were burning then? A. Inside the wall.

Q. Flames of the same type, in your judgment, the same position were burning at the same time you left the wall in the morning? A. At ten minutes to eight.

10 Q. There is no doubt in your mind they were the same kind of flame you saw when you got to that building on the fire call on the previous evening? There is no doubt about that? A. No.

Q. So that if the gas was absolutely cut off from that place at eight o'clock in the morning they were not gas flames, were they? There could not be a question of doubt about that? A. I don't understand.

Q. If the gas was cut off completely from that area before you left at ten minutes to eight those flames that you had been watching could not have been gas flames? A. No.

20 Q. The only place in that fire that there was any trouble about flames re-lighting was in this spot at the back of this building, outside this building, between the wall and the pavement? That is the only place you had any trouble with fire re-lighting? A. No, I would not say that.

Q. You have said so before. You made a statement on the 2nd of April in writing. You say that the debris was red hot but these were the only flames at that time. "We put this out many times but they burst out again. This was the only place we had that trouble." Is that true? A. Yes, inside the wall.

Q. That is as I say, this was the only place where they were put out and re-lit again? A. Yes.

30 Q. How did you put them out--water? A. Could not put them out.

Q. Well they went out and then re-lit again? A. Yes almost immediately.

Q. Well how did you put them out when they went out or did they do it of their own volition? A. With water.

Q. So you put the flames out with water, leaving the debris red hot? A. Yes.

Q. And it is not unusual to have a fire strike up again from the debris? A. It is most unusual.

Q. How long have you been a fireman? A. Seven years.

40 Q. And one of the results of your experience is, you deny that when you have red hot debris that flames will spring up from that debris? A. Immediately.

Q. And you say that is unusual? A. It is unusual, yes.

Q. So unless it is a gas fire, you never have to put the fire out twice do you? A. Not among bricks or anything like that.

*In the
Supreme
Court of
Alberta,*
Plaintiffs'
Evidence
—
No. 16.
George
Constable,
Cross-Ex-
amination
continued.

Q. Anything that is red hot, I do not care what it is, it seems to me it would kindle anything into flame that is inflammable? A. Yes.

Q. And you have never seen that in your seven years' experience? A. No.

Q. You never saw those blue flames on the inside of that wall till after the wall fell out? A. We could not get close enough to see anything in there until after the wall fell out.

Q. But you never did, did you? A. No.

Q. Because you were never in the basement? A. No.

No. 17.

10

Evidence of Baden Powell Hobbs.

No. 17.
Baden
Powell
Hobbs,
Examina-
tion.

BADEN POWELL HOBBS, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. You were the driver of the combination that was the first part of the No. 2 Fire Hall equipment that got to the Corona fire? A. Yes, sir.

Q. You are attached to No. 1 combination. You are the driver of that combination? A. Yes.

Q. But that combination was attached to No. 2 fire hall that night? A. Yes. 20

Q. And with you there was, as we have it, Captain Williamson and Fireman Constable? A. Yes.

Q. And what was the first thing you saw when you got to the rear of the hotel where the combination pulled up? A. The first thing that attracted my attention was the flame right at the base of the wall in the lane running from the basement door west, running between the base of the wall and the cement of the lane.

Q. And how high was that fire? A. Approximately eight or nine inches. 30

Q. And have you any memory of the appearance of it? A. Yes. It was of a blue nature, and the thought struck me it was of a gas nature. That is from the impression I got.

Q. Did you work on it? A. No. I had nothing to do with extinguishing it only except in pumping the chemical apparatus. The captain, I believe, put it out.

Q. And what did you do then? Trace your movements as nearly as you can? A. After pumping the chemical—

Q. What do you mean by pumping the chemical? A. The chemical is a mixture of soda and acid and it has to be turned over before they mix, and it creates a pressure. 40

Q. And after that what happened? A. The captain was on the inside of the door then on the landing just below the steps and he turned

around and ordered me to go back to the hydrant and tell No. 2 pump to string the hose line into the rear of the building in the lane, which I did.

Q. And where was the hydrant? A. I think it was at 106th Street and Jasper on the northwest corner of 106th Street and Jasper.

Q. And you went to that corner? A. The pump was already connected to the hydrant ready to string the hose if necessary. I told the driver to string his line in to the back of the building and I rode on the car back to the rear of the fire.

10 Q. And then what did you do? A. Then I had orders to roll up my chemical hose, put it back on the combination and string another line in from the same hydrant with my combination. It carries a hose also on the back—which I did.

Q. And having done that what was your next action? A. I was told to take my car out of the lane and out of the way because it was no further use. I took it around to the front and I met District Chief Hargrove and he told me to warn the people in the building to get them out of the building. To get the people out of the building.

Q. And did you do that? A. Yes I did with the assistance of two of the clerks.

20 Q. And then you went—after having done that where did you go? A. After the people were out of the building I went around to the back and assisted on a hose line in the basement door down on the basement platform.

Q. You assisted to put a hose line into the basement door? A. The hose line was already in there and I went there to see if I could help out the other two men who were in there.

Q. Did you go very far? A. No, just to the basement platform, that is all.

30 Q. And did you see any fire at the time you then went in, in the kitchen? A. No, sir, not at that time, no.

Q. And did you later see any fire in the kitchen? A. No, sir. I was only in there a matter of three or four minutes. There was intense smoke in there.

Q. Had you been in the kitchen at all? A. Previously, no, just to the door of the kitchen. I believe that is what you are alluding to?

Q. The door of the kitchen? A. That is the basement door.

40 Q. And what did you do in the basement when you were there? A. These two men were working there on this line and I just went in on the platform and helped them to pull their hose around. They seemed to be lower down working in under the south wall but there was so much smoke there that you could not see their actual actions. I was a few feet behind them back of the hose further back.

Q. Were they down in the basement? A. No, in my memory I do not think they were right down on the basement floor—just possibly to the last step of the basement.

Q. Well you spoke of them doing something or being somewhere in

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 17.

Baden
Powell
Hobbs,
Examina-
tion.

continued.

relation to the south wall. What do you mean by that? A. Well I could hear the water in the nozzle. They apparently had put a fire out on the south wall because when I got there they were just turning there and bringing it back again and I was assisting them to pull the hose back, just assisting them, that is all.

Q. That is the south wall of the building? A. Yes.

Q. You are not referring to the south wall of the kitchen, or are you? A. To my impression it is all the same thing. Isn't it the kitchen that leads down to the basement steps?

Q. There is one basement step that leads into the door. There is a 10
step down on to a landing? A. Yes.

Q. And there are a number of steps down into the basement proper. Now the kitchen is on the left hand side just as you come on to that landing? A. Yes. It is only a matter of minutes that I was in there and I am so vague in my memory that I cannot tell whether it was kitchen or basement. I know they were around there.

Q. You may have been under a misapprehension or I may have been but did you at any time see a hose playing on the south wall of the kitchen as I described it? A. It would be the kitchen, yes.

Q. As I described it? A. Yes, to the left-hand side, if that is the 20
kitchen, it would be the kitchen.

Q. And that would be why you had come back down the lane as you have described your movements? A. Yes.

Q. And after you had warned the guests and all that kind of thing? A. Yes.

Q. And did you see that fire put out on the south wall of the kitchen? A. No, sir.

Q. You saw your companions playing the hose on the south wall of the kitchen? A. Yes, sir.

Q. Did you at any time see or know of that fire that was so put out 30
by your companions on the south wall of the kitchen coming alight again?

MR. SMITH: I object to that.

THE COURT: Find out how he knows if he did not see.

Q. MR. WOODS: Did you see a fire that corresponded to the fire on the south wall of the kitchen put out again that night? A. No, sir.

Q. You did not see that happen yourself? A. No.

Q. Now what did you do during the rest of the time you were at the fire? A. I went around to the front of the building, the few minutes I was in the basement landing there. I was supposed to be in the front of the building and then I was ordered by the chief to help connect the aerial 40
ladder and when the ladder was connected and hooked up in readiness I worked at the top of the aerial ladder for the rest of the time I was at the fire.

CROSS-EXAMINATION BY MR. SMITH.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 17.

Baden
Powell
Hobbs,
Cross-Ex-
amination

Q. When you came in to assist Williamson—you have been talking to Williamson since he gave evidence here? A. I have, yes, sir.

Q. About this lawsuit? A. Yes.

Q. He told you about the questions I had been asking him in here, didn't he? A. Some of them.

Q. THE COURT: Is that true, Williamson told you that—he talked to you about the evidence he gave here and the questions asked by counsel? A. Yes.

10 Q. Mr. Smith: There is no doubt whatever that when you came to the landing to assist these people with the water hose the people you were assisting were Williamson?

THE COURT: It might be just as well if I say to you so that you may tell Captain Williamson and you may carry it on to any of the rest of your force that if you have to give evidence in other cases that what you and Williamson have done is quite wrong. I do not know who should have warned you of it but it is just as well if the fire brigade knows it is improper. A. I understand your explanation but I did not know it was improper.

20 MR. WOODS: It is a pretty natural thing to do.

THE COURT: I am not so sure about that. It is one of the kind of things that forces of that kind might be expected to know.

Q. MR. SMITH: The men you assisted with this hose were Munson, Kinsman and Captain Smith? A. Yes.

Q. I am speaking of the time when you came into the landing which was the only time you were on the landing at the top of the basement stairs? A. Yes.

30 Q. And there is no doubt whatever that when you were on that landing, Kinsman, Smith and Munson were working down below you? A. Yes.

Q. And you will agree with me then that there was no possibility you were in the kitchen? A. As Mr. Woods explained to me if the kitchen was to the left-hand side of that landing then it would be the kitchen.

Q. You were on the landing? A. Yes.

Q. There is no doubt about that? A. No.

Q. Munson, Kinsman and Smith were below you? A. Yes.

Q. No doubt about that is there? A. No.

40 Q. And the kitchen is not below you. It is immediately to your left. They were not in the kitchen at all, were they? Were they? A. If it is not below me it would not be.

Q. Then it is not below you and that puts an end to it as far as you are concerned? A. Yes.

*In the
Supreme
Court of
Alberta,*
Plaintiffs'
Evidence
No. 17.
Baden
Powell
Hobbs,
Cross-Ex-
amination
continued.

Q. You never saw any fire in the kitchen because you were not in there? A. Yes I did see the fire in the kitchen. I mean the fire right ahead of me. The kitchen is to the left of the landing.

Q. Yes. A. Then I did not see any fire in the kitchen, no.

Q. And that is what you told the first time, and that is true, that you never saw any fire in that kitchen—no. Can you give me or do you care to give me an estimate of the time that elapsed from the alarm, which we know was eleven minutes past nine? Do you care to give me an estimate of the time that elapsed between then and the time Deputy Chief Hargrove ordered you to warn the people? Perhaps I had better recite to you what you did. You came there, as I understand you, and you went to the door leading on to this landing with Captain Williamson? A. Yes, sir. 10

Q. He told you to pump the chemical, which you did? A. Yes.

Q. That is where you got your pressure and that is how the chemical comes out? A. Yes.

Q. And as I understand you he told you then to go to the corner of 106th and Jasper which you did? A. Yes.

Q. To tell them to string a line to the rear of the hotel. That is right? A. Yes, sir.

Q. And then, as I understand you next, the next think that was done while you were there was to lay a second line from that same hydrant? A. Yes. 20

Q. So you were engaged in or saw these two things being done? A. Yes.

Q. And then you took the combination around from the back because they had stopped using it, I suppose? A. Yes.

Q. It was in the way? A. Yes.

Q. And you took it around to the front? A. Yes.

Q. And you parked it somewhere? A. Yes.

Q. And after that you went into the front of the hotel? A. Yes. 30

Q. And the lights were burning in the hotel at that time, weren't they? A. I cannot just remember whether they were or were not.

Q. In any event there was sufficient light in there for you to identify Deputy Chief Hargrove or him identify you? A. He met me in the front door.

Q. And you broke the automatic fire alarm there and personally went through the hallways warning people out? A. Yes.

Q. Were there many people there. A. Quite a few.

Q. And you had no difficulty in getting through the hallways to these people at that time? A. Except for the smoke. 40

Q. Well they would be smelling the same smoke as you would? A. The most was to the rear of the building.

Q. Well there must have been lights on at that time. These people were not sitting in the rooms in the dark? A. I had a flashlight of my own.

Q. Were there any lights on then? A. There could not have been.

Q. And the people were still sitting in the dark? A. Towards the front of the building there was very little smoke.

Q. Were there people sitting up to the front of this smoke-laden building? A. They were travelling back and forward between the landings to their rooms and the stairways.

Q. And you, after having got there and performing the various functions of yourself, the people were running about in dark in the stairways? A. Yes.

10 Q. What were they running around for — fun? A. Trying to get wearing apparel.

Q. People usually keep wearing apparel in their rooms, don't they? That is usual in a hotel, isn't it? A. I think so.

Q. Well what were they running around the landing getting wearing apparel for? A. Going to their rooms.

Q. Where from? A. From downstairs and anywhere where they happened to be.

Q. So at that time it was quite possible to go up that stairway? A. Yes.

20 Q. There was no policeman there to warn them off? A. Not when I was there.

Q. And that would certainly be a good half hour or more after the alarm went in? A. I suppose.

Q. Look at all the things you do. You have been the busiest fellow we have found yet. There must have been a good half hour elapse? A. Yes, in my opinion, that is.

30 Q. Now finally the fire got the best of the situation and the place burned down. There is no question the main fire that night was in the Motor Car Supply and that is what burned the place down? A. I would not be prepared to say that.

Q. You were not in the basement of the Motor Car Supply Company? A. No.

Q. And you do not know of any other fire that was in the basement that night? A. Not to my knowledge.

Q. THE COURT: Do you recall when the request was made to exclude certain witnesses when Captain Williamson was called to give evidence? A. Yes.

Q. And you were one? A. Yes.

40 Q. Have you any idea, as an intelligent man, why that was done— why you were asked to leave the Court room? A. Yes, I have.

Q. And what do you think it was? A. I was not supposed to hear his evidence. That is all.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 17.

Baden
Powell
Hobbs,
Cross-Ex-
amination
continued.

No. 18.

Evidence of Alfred Hargrove.

ALFRED HARGROVE, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. You are district chief of the Edmonton Fire Brigade attached to No. 2 Station? A. Yes.

Q. On 4th Street? A. Yes.

Q. And on the night of the fire we have it that the alarm came into that station at eleven minutes past nine o'clock and that the equipment responded? A. Yes. 10

Q. And you went to the fire and got there about how soon after the alarm came in? A. Within about two minutes.

Q. How did you get there? A. In the chief's car.

Q. Driven by? A. W. Airth.

Q. And you went to what part of the building? A. Entered from the front and went straight to the back.

Q. The hotel clerk said the fire was at the back and I went straight to the back and that was the kitchen.

Q. You stopped in front of the hotel and you spoke to the clerk and he told you the fire was in the back? A. Yes. 20

Q. And you then went straight through to the kitchen? A. To the kitchen, yes.

Q. And you went through which way? A. Through this door marked "A."

Q. And then you go through another door there? A. Yes.

Q. And then down the hallway and then through another door here? A. Yes.

Q. And then you are in the kitchen? A. Yes.

Q. You did not go into the kitchen by way of the dining room as is possible to do? A. No. 30

Q. You went in the way that I have marked there with "A., B., C." through those three doors? A. Yes.

Q. And then when you got to the kitchen what did you see? A. The first thing I noticed was a slight flame on the south wall west of the basement door.

Q. On the south wall of the kitchen? A. Yes.

Q. West of the basement door? A. Yes.

Q. And where was it in relation to the wall? A. It would be about four or five feet probably from the door. 40

Q. Four or five feet west of the door? A. Yes.

Q. And how high on the wall? A. Round about six feet.

Q. And had any plaster burned off there? A. No I did not notice any.

Q. Now we speak of four or five feet west of the basement? A. Approximately.

Q. That is this door that goes out, the door you are now referring to is the door out of the kitchen on to the landing that leads to the basement door? A. Yes.

Q. Now did you notice anything about that fire on the kitchen wall as to whether there had been anything special about it? Was it a new fire or an old fire? A. There was nothing special about the outside of it. It seemed to be burning on the inside between the plaster and the wall breaking out through the plaster. In all probability the plaster was already broken where that flame was coming through.

Q. Can you give me an idea what the flames looked like? A. It was just like a small jet coming up, of a bluish colour.

Q. And where was Captain Williamson at this time? A. I had not seen him then. He was a few steps down the basement stairs.

Q. And what did you do in connection with this fire such as you speak of? A. I asked for the chemical line. They were using that round by the stairs and I asked for it to put that fire out.

Q. You sent to him for the chemical line? A. No, I called to him for it and he handed it up shortly after.

Q. And who was with you by the way? A. Fireman Browning.

Q. And was it fireman Browning or yourself? A. No, he put it out.

Q. With the chemical? A. Yes.

Q. On the wall? A. Yes.

Q. And then what did you do? A. I should mention I sent the driver back. I told him to go back to the operator that was at the hall to notify the Gas Company. I took it for granted that was gas, when I got there, right away.

Q. And you told Airth to go back and tell the operator? A. Yes.

Q. And what was your next step? A. I just looked around to see if there was any more fire around there and I did not discover any more and I went to the back and removed the coal chutes and quite a quantity of smoke came up there, and flame.

Q. That is in the lane? A. Yes. One was a round opening and the other was a square opening and there were covers on them and I removed the covers.

Q. There was smoke and flame in them? A. Well in the square one I could not say but in the coal chute flame was coming out.

Q. And what did you do about that? A. There was a line put down there. The water line had already been stretched from the pumps.

Q. And by that time there had been a line stretched from the pump at the corner of 6th Street? A. Yes.

Q. And a line of large hose was put down these chutes? A. Yes. And the other one was used on the top of the stairs. The other one was passed into the basement from the top of the stairs.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 18.
Alfred
Hargrove,
Examina-
tion.
continued.

*In the
Supreme
Court of
Alberta,*
Plaintiffs'
Evidence
—
No. 18.
Alfred
Hargrove,
Examina-
tion.
continued.

Q. And you yourself did what, after that, as nearly as you can remember? A. Well I was there for a bit and then I went to the basement and there was a small fire down there and I went to see which was the best way to get at it and I saw that the door from the elevator was the best way because a man would have had to go such a distance from the stairs to where the fire was.

Q. And where was that? A. Just by the elevator.

Q. There was a fire by this time burning by the elevator? A. Yes.

Q. And you thought the best way to do was to fight it from the elevator? A. Yes. 10

Q. So you came around. And did you fight it from the elevator? A. Yes. We got the doors open and put a ladder down there and by that time the chief was standing just close by the elevator and we let a ladder down and Captain Williamson went down and fireman Campbell and they played the line into there for several minutes and they had to come out on account of it getting too hot for them.

Q. And then after that? A. I went to the front and told the clerk they had to tell every guest to get out of the hotel.

Q. And then what did you do? A. I came back again and Number 1 was there and I decided to take a line again and go down this elevator shaft again and I went down with them. There was three men besides myself. By that time some obstruction had fallen and had wedged the doors in the position of half closed. 20

Q. That is the elevator doors? A. Yes. The doors open outward into the basement.

Q. And they had got, on account of some obstruction falling down, about halfway closed? A. Well more than half closed. And we played a stream on there for some time but it took no effect whatever and then we were ordered out by the chief. After that lines was then being played through this window—shortly before that. 30

Q. That would be the back windows? A. Yes the back windows.

Q. The window into the back room? A. Into the rear room

Q. Of the east side? A. Yes, of the east side.

Q. And here is a room here and the elevator is right there, at that corner where I have drawn. Where was the fire going so strongly that they were shooting the hose through the windows—in what room? A. In this room here. Part of the floor had given away.

Q. That is near the elevator shaft? A. Near the elevator shaft.

Q. West of the elevator shaft? A. Yes.

Q. So that you are putting your finger on a place on this Exhibit number 5, being the ground floor plan, that is in the southwest corner of the room marked "Private D.R.?" A. No, in the southeast corner. 40

Q. Yes. And the floor had given way at that room, partly? A. Yes.

Q. And the fire was going in that room at that time? A. It was just coming up.

Q. And there were windows on the lane from that room, or one window? A. Several windows.

Q. And through one or more of these windows the lines were being played? A. Yes.

Q. Now do you remember at that time whether there was any fire particularly in the part east of there? A. When I went out there was no sign of smoke coming from the Motor Car Supply at all. It was from this corner here by the elevator as far as the basement steps. That is all the smoke I saw there. There was no sign of anything at the Motor Car

10 Supply then.

Q. And this time you speak of when the hose was being played through the window we have marked? A. That is just after I had made an inspection of the back.

Q. And there was no smoke visible from the Motor Car Supply Company place on the ground floor? A. No.

Q. And then what did you do after that as nearly as you remember in the order of time? A. I was superintending the fire around the back and I went around to the front to see if there was any sign of fire there in the front.

20 Q. And was there any sign of fire in the front? A. None whatever.

Q. No sign of fire in front of the hotel or the Motor Car Supply Company? A. None at all. And just shortly after that the electrician was in there to move the switch board out. I was in there then. And after that I came to the back and I found fire burning in the wall behind the coffee urns in the kitchen.

Q. That is on which wall of the kitchen? A. That would be the east side. I would sooner show it by the blueprint and give you an idea.

30 Q. Now this is a copy of a plan furnished to me by my friend from such information as they have. Now will you identify where the coffee urns were? I am not proving all the particular things on the plan. Here is marked coffee urns here. Is that about where the coffee urns were on the west side? A. Yes.

Q. Somewhere about where they are marked here — the words "coffee urns and gas." Here is the kitchen. A. Just outside the kitchen "China and linen" it is marked.

40 Q. And the coffee urns—was that a wall of the kitchen—a separate room? A. They were somewhere about here and the fire was burning behind the coffee urns and whether the coffee urns were this side or not I could not say.

Q. That is the west side, where they are shown, or the east side where I have put two little crosses you are not sure? A. No, but they were burning there.

Q. But there was a fire burning on the wall there? A. Yes, similar

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 18.
Alfred
Hargrove,
Examina-
tion.

continued.

to the fire I saw in the kitchen in the first place. After that was put out I came over here and I found a door there. The door was padlocked and I took the lock off and I saw a fire similar burning in the wall here.

Q. Burning in the wall of the linen closet? A. Yes.

Q. On the wall where I put a little "X?" A. Yes, that is it.

Plan of ground floor of Corona Hotel, marked Exhibit 14.

Q. And having done that you were around there then, and did you go into the dining room? A. Yes these two doors here, I opened up here—are swing doors.

Q. Let us use Exhibit 14. Which doors are swing doors? A. There 10
(indicating).

Q. The ones going out into what is called the dressing room? A.
Yes.

Q. And there is a place called "entry" and another swing door? A.
Yes.

Q. And where did you go? A. When I came in here a hose line was brought with me and used here and then I tried this door here and I found the fire was underneath.

Q. Where is that? A. Just about a foot into the room marked
"dressing room." 20

Q. And where was the fire? A. Under the floor.

Q. And what did you do about that? A. I cut a small hole in with an axe and put a line in for a few minutes and after that I was told to get out.

Q. And did you go into the dining room at all? A. No. Later on I went in there.

Q. That is the main dining room? A. Yes.

Q. And you were told to get out, and you got out, did you? A. Yes.

Q. You went around to the back? A. Yes.

Q. And where did you go from there? A. I was using the hose 30
again on the top of the basement stairs, the same place where we put it out before.

Q. What place was that? A. The top of the stairs and underneath the kitchen floor.

Q. Underneath the stair landing? A. Yes.

Q. On the underneath part of the stair landing would it be? A.
Yes.

Q. And there was fire going there when you got back from this excursion you have told us about? A. Yes.

Q. And you and your men put it out? A. They tried to put it out. 40

Q. Had you put one out before? A. Yes.

Q. When was that? A. When we first got in.

Q. And this was how long after you had first gone in? A. Oh I could not give you any approximate time.

Q. All of these things had happened to you, at all events, in the meantime? A. Yes.

Q. And the fire had broken out again on the underside of the stair landing? A. Yes.

Q. And did you put it out? A. Yes I believe so.

Q. And did you notice whether it came on again? A. Yes it did.

Q. When? A. Later on at the finish and we never put it out.

Q. You never put it out the next time? A. No. We checked but did not put it out.

10 Q. And having done that where did you go? A. I was sent to the front and stayed there till the finish. When I got round there the large dining room then was just filling up pretty bad with smoke. I had a line that was already laid brought through to the front and I told the men to stay there as long as they could and eventually they had to back out. From there I went to the front door of the Motor Car Supply and conditions were then getting bad at the back.

Q. After this time that you had tried to get this fire out the second time or put out the second time you came around to the front? A. Yes.

20 Q. And you and some of your men noticed that by that time smoke and fire was increasing in the main dining room? A. At the rear of the main dining room.

Q. Did you see fire and smoke or only smoke? A. I said it was ready to burst out. It was heavy with smoke and by the time I brought the line in through the front door—

Q. And across the lobby and your men lay it ready— A. Well it was brought in with them.

Q. The fire had burst out? A. Yes. It was in full control of the rear of the main dining room.

30 Q. And you told your men to stay there as long as they could? A. As long as it was safe to stay.

Q. And play the hose on that fire? A. Yes.

Q. And having done that you walked out of the front door and walked along to the door of the Motor Car Supply Co.? A. Yes.

Q. And what do you say as to when the fire, according to your observation, reached the Motor Car Supply Company's premises? A. Well do you mean the back of the fire?

40 Q. Well wherever it reached first. A. Well what I seen was at the back here when the chief was there. He was superintending the fire at the back most of the time. The only time I saw that was when I looked in there and the fire was at the west side of the Motor Car Supply. I saw them when they had the place open.

Q. That is on the ground floor? A. On the ground floor.

Q. And Chief Dutton was there by this time? A. Oh he was there a long time before that.

Q. He had been there for some time before? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 18.

Alfred
Hargrove,
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta,*
Plaintiffs'
Evidence

No. 18.
Alfred
Hargrove,
Examina-
tion.
continued.

Q. And you had seen the fire on the west side of the rear portion of the Motor Car Supply Company premises. And with relation to—what time was that with relation to some of these other events? Was it at the time you went down the elevator shaft the second time? A. It was after that.

Q. You gave me your movements and I am afraid I will have to think them over tonight and follow them there. I want to get when that was as nearly as I can.

At 4:30 p.m. Court adjourns till 10:00 a.m.
Wednesday, January 17th, 1934.

10

Wednesday, January 17th, 1934.
Court resumes at 10:00 a.m.

Q. At adjournment last evening we had come to the point in your narrative as I remember when you having got into the front of the Corona Hotel and seeing conditions there and set some men there to fight the fire that was then breaking out in the dining room—had gone out and gone into the front door of the Motor Car Supply Company? A. Yes.

Q. And I would like you to detail as carefully as you can now for the information of the court what you found when you went into the Motor Car Supply Company, the conditions you found there, especially with regard to the possibility that has been suggested here that that fire originated in the basement of the Motor Car Supply Company? Will you go on. A. When I went to the Motor Car Supply Company the fire was burning then well at the back particularly on the ceiling, in fact it was all over the rear. That would be fifty to sixty feet from the front, I suppose. 20

Q. I have a sketch here which I will put the manager of the Motor Car Supply Company in in order to verify. But this will make your story understandable. It is not drawn to scale but you will understand. This is the ground floor and this is the basement. Your present statement has to do with the ground floor? A. Yes. 30

Q. You came in the front entrance? A. Yes.

Q. And go on and tell me where the fire was. A. I did not come any further than about here.

Q. That is just at the front door? A. Yes. You could not get any further than that. The fire was all at the back here.

Q. At the back of that part on the ground floor? A. Yes. It burst out in flame all over the back. It was only a matter of a few minutes till it came forward. We kept two lines playing on it as long as possible and by that time the fire had started coming out from the front. 40

Q. Out on to the street? A. Yes on to the sidewalk. Those lines played there for probably a matter of ten or fifteen minutes. Next door was a cafe I believe. The frames of the windows had caught fire and

that was put out. And it was shortly after that these lines began to be burned up. We disconnected these lines and connected it to the tower nozzle, that was on the aerial truck. That nozzle was kept on the floor of the building. Fire had burst through the roof on the Corona side before this and that power was kept working there until the majority of the fire—well it was kept there for a considerable time. After that the lines were broken up and connected to two nozzles and they were used on the front till the finish of the fire.

10 Q. Do you know how you could have got into the basement underneath that front part of the Motor Car Supply Company? A. The only means was by the stairway and I believe the stairway was somewhere towards the centre. I am not quite sure about that.

Q. There is marked here on this little plan, which I will prove in the way I have mentioned, the stairs on the west side towards the rear? A. Well towards the rear. I could not tell exactly the distance but it was some little distance in.

Q. And was that a stairway going down or do you have to open a flap? A. No I believe it was an open stairway.

20 Q. And did you when you went into the Motor Car Supply Company observe the smoke or fire coming up that stairway? A. No I could not say. I was not in the rear at all only by the door where it was the chief who superintended the fire fighting in the rear of the Motor Car Supply Company.

Q. The rear of the Motor Car Supply Company at the lane so far as the basement is concerned? A. That was unexcavated at the back.

Q. And that unexcavated part of the basement, according to this layout plan Exhibit 4 which is already in, comes from the lane up to the places shown there and the part marked "unexcavated." A. Yes.

30 Q. And beyond that is the hotel basement? A. Yes.

Q. And you say the chief superintended the fire in the rear of the Motor Car Supply Company. When you say that do you refer to the rear on the ground floor? A. On the ground floor.

Q. That is the ground floor and there is the Motor Car Supply Company on the east part of the building? A. Yes.

Q. And it is that you refer to? A. Yes.

40 Q. So far as your observation is concerned, was there any fire in the rear of the Motor Car Supply Company in the basement at the time you went in? What do you say about the suggestion that this fire started in the basement of that building? A. After arrival there when I spoke about putting lines down coal chutes there was no smoke whatever at the rear of the Motor Car Supply Company. The smoke extended practically from about the elevator due west to the basement door. All the smoke we encountered was between that portion. That was at the beginning. Later of course—what fire I seen in the Motor Car Supply Company was on the west side and not only that, there is a brick wall dividing the two fires.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 18.

Alfred
Hargrove,
Examina-
tion.

continued.

Q. And when did you see that? A. That is when I seen the chief there. I just had a glance of it, that is all. I was conducting the fighting at the top of the basement steps.

**Sketch of Motor Car Supply Company premises
marked Exhibit "A" for identification.**

THE COURT: Was the Motor Car Supply Company's premises part of the same structure as the hotel?

MR. WOODS: Part of the same structure—yes. There was a brick wall dividing the basement, where there was a basement in the Motor Car Supply Company, from the basement of the hotel. 10

MR. SMITH: Are you sure it was brick? Was it tile?

MR. WOODS: Well I may be wrong.

Q. Now you spoke in the early part of your testimony of the flame that you saw along the south wall of the building. Do you remember?
A. Yes.

Q. And did you see that? A. Continually all night until six o'clock the next morning, maybe before six or a little after but it was close to six.

Q. And will you describe that flame, what was the appearance of it, and as to what was done with it, and as to whether it was put out or not or whether it re-occurred? 20

THE COURT: Are you speaking of the fire in the structure?

MR. WOODS: I am speaking of the fire of which evidence has been given by this witness as well as others, of the fire that was coming up continually between the concrete pavement and the lane and the south wall of the building. Will you tell as closely as you can just what you observed?

THE COURT: And do I understand you to say you saw that for several hours, nearly all night? A. Yes, sir. 30

MR. WOODS: Until somewhere near six o'clock in the morning?
A. Yes. After the fire was over and the companies was sent back there was a detail of men left there and I was left in charge and I was there till a quarter past eight. And that fire was continuous all the time on the south wall, both inside and outside. Sometimes the flames would only be six inches and it would vary to eighteen inches and it varied and sometimes it would be out and sometimes when I came back it would be lighted. 40

Q. You are speaking of later, during the morning? A. Well up to the collapse of the building.

Q. You spoke about eight o'clock? A. That is when I was relieved by another officer. I am giving the approximate time I was there.

Q. But I want it in chronological order. During the night what did you see of it during the night while you were fighting the fire while it was going? A. Just the same conditions. I see it in patches.

Q. Whereabouts? A. All along the south wall more or less. In some places it would be a space and then you would come to another patch of it, and that extended really from a little west of the basement door completely to the east.

Q. And what was the character of that fire? You are an experienced fireman. What did it look like? A. It looked like gas.

10 Q. Why do you say that, sir? A. From past experience.

Q. And did you know of it being put out from time to time? A. Yes, the fellows put it out several times because it was uncomfortable at times for them working there.

Q. What men? A. The firemen.

Q. And there were some gas company men there too, weren't there? A. Yes.

Q. After it was put out do you know of it starting again? A. Yes, it re-ignited again.

20 Q. And did that happen several times? A. Yes, all through the night. At the finish I got tired of putting it out.

Q. And you spoke to me a moment or two ago about seeing fire and I connected it with this kind of fire, whether rightly or wrongly, inside and outside the walls at eight o'clock, I thought, in the morning?

A. No, I said I was on duty there till eight o'clock next morning and these flames died down about six o'clock and then we were able to put the debris out. I noticed one particular occasion there, I suppose around 30 the line there myself to see what effect it would have on it and it had no effect whatever except a little black patch. I swung the line around to the basement to put flames out there and those bricks did not cool down until after about six o'clock, whether it was because the gas was shut off I don't know. Anyway, it was diverted from its course and that was the only time we had any success with the rear.

Q. And what would you say from your experience as a fireman as to whether that fire starting as you told us you saw it start was being fed from outside sources? A. Being fed from outside sources—yes.

40 Q. Continually during the night? A. Continually during the night, yes.

Q. I want to get that clear about these red hot bricks. These bricks were red hot? A. Heated by the fire, yes.

Q. From this fire that was going up outside? A. No, the inside I am referring to now.

Q. The inside of the basement? A. On the unexcavated part. The fire in the southeast corner, that is the Motor Supply Company.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 18.

Alfred
Hargrove,
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta,*
—
Plaintiffs'
Evidence
—
No. 18.
Alfred
Hargrove,
Examina-
tion.
continued.

Q. And then you turned the hose on those? A. Yes, it was kept continually on.

Q. And then having put that particular fire out at that place you turned the hose to another place near there where a similar fire was coming up the bricks? A. Yes.

Q. And by the time you had the second one out this one— A. — had ignited again.

CROSS-EXAMINATION BY MR. SMITH.

Cross-Ex-
amination

Q. How far was this pile of bricks in from the lane? A. From the edge of the building it would be probably ten feet. 10

Q. So that your idea is that gas escaping in the lane, that it penetrated then through the air, I take it another ten feet to ignite these bricks? A. Yes.

Q. You understand me, I take it? A. Yes, I understand.

Q. Now there is no question at all in your mind that these gas flames were shut off at six o'clock? A. Near about six o'clock. I noticed it from the outside.

Q. In any event there is no doubt that they were not burning at eight o'clock or ten minutes past eight? A. No.

Q. None whatever? 20

Q. Well are you sure? A. Sure, yes.

Q. So if a man swore in this Court House yesterday—Constable—that those gas flames were burning at eight o'clock, either he is wrong or you are wrong? A. Yes.

Q. Do you also know that at six o'clock the gas company went down to that conduit box and put a vent in there and that is when those flames did go out? A. I do not know what they done. I know they had captured or done something to divert the gas.

Q. You were there and you were observing things. Did you see them go through that pavement and go down and put a vent pipe in? 30
A. Well I see them working there. They were working all night.

Q. And it is after that the fire went out. There is no doubt about that? A. Yes.

Q. And when you got to the Motor Car Supply Company, after that time, it was after you had gone into the main dining room of the hotel. That is true? A. Yes.

Q. When you went into the Motor Car Supply Company it was after you had gone into the main dining room of the hotel. I am speaking of when you and your men put the hose into the main dining room? 40

A. Yes.

Q. When you found the back end of it burst into flames? A. Yes.

Q. And as you described it the fire had complete control of the back end of the main dining room? A. Yes.

Q. So it was after that that you went to the Motor Car Supply Company and saw the back end of the Motor Car Supply Company engaged with flames or in control of the flames? A. Yes.

Q. And the Motor Car Supply Company was burning to an extent that you could not leave the front doorway of that building. You could not get any further in. A. No, it was too hot.

Q. So there is no doubt in your mind, is there? Remember at that time you had men in through the hotel and fighting flames in the dining room of the hotel. That is true? A. Yes.

10 Q. So there is no doubt at all that at that time you could get much closer to the flames in the hotel than you got to them in the Motor Car Supply Company? A. Yes, we got closer to them.

Q. One might then reasonably conclude that the fire had further advanced in the Motor Car Supply Company than it had in the hotel. Is that fair? A. Probably, at that time, yes.

Q. I think you agree with me, don't you? A. I don't know what conditions were at the rear of the fire I saw from the front.

20 Q. Perhaps it is a reasonable conclusion that at that time the fire had advanced further in the Motor Car Supply Company than it had in the hotel and I take it you agree with that view? A. Yes.

Q. Now I want to make this also quite clear. As I got your answer that you gave Mr. Woods this morning—that when you got to this fire at the rear end of the building and after your lines were laid to the rear end there was no smoke in the hotel basement except in that area from the stairway to the elevator door? A. Oh smoke was charging through the basement to an extent all the way through, a certain amount of smoke but the most of it lay in the rear towards the east end of the basement.

30 Q. Well I imagine you were asked that question so that someone could conclude that there was no smoke coming through the brick wall from the Motor Supply basement. Now are you going to say in your judgment there was no smoke coming from the Motor Car Supply Company basement? A. When I refer to smoke I refer to the outside. There was no appearance of smoke when I got there first, coming from the Motor Car Supply Company.

40 Q. I think you misunderstood Mr. Woods. Will you read just what he said? He said in the basement there was no smoke except at the rear end between the stairway and the elevator door. I will ask you again. I am speaking of the time early on when you got to this fire and were at the back end of the building and you went down the stairway. As I understood you to say that there was very little smoke in the basement looking north, the most of the smoke was on the line between the stairway and the elevator door? A. Correct.

Q. That is correct? A. Yes.

Q. So that there is no doubt whatever that had you chosen to do so you could have taken your line through the basement and attacked that

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 18.
Alfred
Hargrove,
Cross-Ex-
amination
continued.

fire in the southeast corner from the basement floor. Perhaps I had better show you the plan Exhibit 4. My suggestion to you was that if you had cared to do so there was no reason you could not have gone from the basement stairs beyond the coal bin partition and attacked that fire from there rather than from the elevator shaft if you had seen fit to do so. A. Well I had the report from the Captain that he had put this fire out in the basement here.

Q. You are pointing to some fire near the stairway? A. Yes.

MR. WOODS: That is Captain Williamson? A. Yes. He said "There is heavy smoke here" and he thought the fire was back here. 10

MR. SMITH: You mean near the south wall to the easterly side? A. Yes. I suggested then we open the elevator doors and get down there because it was safer to get down there.

Q. You mean it was safer to attack from the elevator shaft rather than follow the route I suggested to you. A. At that time.

Q. And safer for what reason? A. I don't know how far that fire had gone under the floor and the floor would fall in and the men would get trapped. I have the responsibility for these men and I am not going to put them in a place where I think it is dangerous.

Q. You are referring to the fire in the southeast corner of the building and the floor you speak of is the floor above that? A. The ceiling of the basement—the ground floor. 20

Q. What examination had you made of the floor at that time to determine whether or not there was any danger of that floor falling in? A. I knew the floor was going in because of the sign of the smoke coming out from the chutes and seeing no fire below, that the fire had communicated between the ceiling and the ground floor.

Q. And you never went into that basement to make that examination? A. I went down a few steps and then I come to the conclusion then when I saw the fire raging in there that I would not put men in underneath that. 30

Q. You are speaking of the fire in the southeast corner? A. It is not only in the southeast corner. There is a fire spread upon there. It looked to be going, from a view from the elevator.

Q. What I am getting at, when you—and you were in charge at that time? A. Yes.

Q. You went a few steps down there and you knew there was a fire raging along the south wall on the easterly side? A. I was not sure of the fire raging there.

Q. Burning there? A. Yes. 40

Q. And you never went down that basement where you could get a look at that fire? A. I could not see anything when I got down there.

Q. You did not go? A. I took the report from the Captain that went down there and he said he could not see anything down there only smoke.

Q. Captain Williamson reported to you and you yourself observed that from those steps you could not see that fire that was burning over in the southeasterly corner? A. I could not see it for smoke. We took it it was burning there by the quantity of smoke.

Q. And yet you only went down where you could see it? A. I could only see smoke when I went down there.

Q. And this is the same basement that some considerable time later firemen Kinsman and Mr. McGregor walked clear through to those boilers and back again. A. Yes, I know that, because conditions altered.

10 Q. Well did you put the fire out that was making all this smoke? A. No, the fire varied. He happened to pick the time it was out. As I told you before that fire was put out several times—twice to my knowledge.

Q. Are you telling me that this fire in the southeast place which no doubt was responsible for the falling of the ceiling above, you know the fire I mean? A. Yes.

Q. You put that out? A. Tried to put it out.

Q. A moment ago, if I understood you correctly you said you put it out. Now did you or didn't you? A. We never put it out.

20 Q. And this much is also true, I think you will agree with me, that when you arrived at that fire it was all confined to the basement area at the back of the hotel in so far as you could see plus the fire in the kitchen wall. A. Yes.

Q. So that there is no question at all that when the fire brigade arrived, whether this is a gas fire or any other kind of fire, it was confined to that comparatively small area? A. As far as I could see.

Q. And it was never attacked from the basement floor to the north of where the fire was raging? A. Yes, the line was placed down there and carried right across there from the inside.

30 Q. You swear you played on that fire? A. I did not at all.

Q. Do you swear your men played on that fire from the southeast section from the stairway? A. The hose was used down there and naturally they would use it right across there.

Q. How far are they going to get it to that wall that goes to the roof? How are they going to shoot through that wall? A. They shot through here as far as I could see.

40 Q. Then they played their hose against a wall which stopped the water from getting through to where the fire was, and that is what you mean by playing water on that fire? A. I don't know what they were playing on. They played in there.

Q. Well do not let us misunderstand each other. You know now perfectly well they could not play water on that fire from the southeast section of the stairway. A. The line was being played down where it had borne through past the elevator and the line was played from above on the first floor where it had burst through.

Q. You told me a moment ago they played that fire from the base-

*In the
Supreme
Court of
Alberta,*

Plaintiffs'
Evidence

No. 18.
Alfred
Hargrove,
Cross-Ex-
amination
continued.

ment steps? A. One line was there and the other line was put through shortly after.

Q. And you are still not going to suggest that anybody could put water on that fire from these basement steps? A. Well that was the idea of getting down, to see if we could do more good there.

Q. And you found you could not do any more good there because Williamson says he was driven right back. I am speaking of the fire when it was confined to this narrow area, and I am right in saying that no member of this fire brigade attacked that fire from the basement floor to the north where there was no fire at that time. I am right about that am I not? A. Not to the north at that time, no. 10

Q. Now I will talk to you about the kitchen. You said yesterday that when you first went from the hotel to the back, as I understood you, at the plaster on the south wall, there was fire which was in the nature of a jet? A. Yes.

Q. And I understood you to say that you did not observe that the plaster had been broken from the wall at this jet? A. It could have been broke but I could not say that I noticed it.

Q. So perhaps you will agree with Captain Williamson that there was plaster broken from the wall on that south wall and that is where this fire was burning? A. Probably so, yes. 20

Q. You accept his view. There is no doubt that is the fire that you saw? A. Yes.

Q. And if that plaster had been so removed how could you have a jet? He said it was a lazy flame of a natural color. Do you think you saw a flame burning at the same place he did? A. I could not say. He simply told me he had already put that out.

Q. Then you have that much information about it? A. Yes.

Q. And yet you say it was burning in the form of a jet? A. That is what it appeared to me. 30

Q. Well that is not a lazy flame. A jet indicates some pressure? A. Yes.

Q. And you say that flame was blue in color? A. It appeared to be.

Q. At one time you said bright blue or very blue? A. No I could not say I did.

Q. You made a statement in writing on the 21st March, didn't you? A. Yes.

Q. And I am reading from what has been given to me by your chief as a copy. You say "I went to the kitchen and saw flames on the south wall of the kitchen. I believe they had been already put out once by Captain Williamson but I did not know it at that time. I am convinced they were gas flames. They were a very blue color." Were they? A. I suppose, if it is there. It was my impression at the time. 40

Q. Were you right then or are you right now? You would be

more likely to be right in March, after the fire? A. Well it appeared to be blue to me.

Q. Was it very blue? A. I cannot say very blue.

Q. You made a statement, that having observed this flame from your experience with the fires and as a fireman you thought they were gas flames? A. Yes.

Q. Now I take it that in coming to a conclusion as to it being a gas flame color would be one of the things you would take into account? Was it? A. Yes.

10 Q. And the fact that it was burning in the form of a jet was another thing you took into account? A. Yes because you could see nothing else to burn.

Q. There was lath there? A. Yes.

Q. And lath burns? A. Yes.

Q. And particularly this woolly lath which is behind plaster? A. Yes.

Q. Is one of the fastest conveyors of fire that we know of? A. Yes.

20 Q. And you saw it was in the form of a jet and you saw it was very blue and therefore you concluded it was a gas flame? A. Yes.

Q. And those were your reasons? A. Yes.

Q. And the fact that there was nothing else to burn except the lath. Those are all your reasons for concluding it was a gas flame? A. Yes.

Q. And if that flame was natural in color and was not burning in the form of a jet your reasons for concluding it is a gas flame are all gone?

30 MR. WOODS: My friend has not any right to put a question which is not borne out by the evidence. The question he is putting to the witness, the description he is giving, refers to the evidence of Captain Williamson. Captain Williamson saw a flame at that place but it was not the same flame this man saw. He put out the flame he saw and it was a different time. And it might be to Captain Williamson's eye the flame he saw had a natural color whereas to this man's eye the flame he saw had a bluer color. Moreover, Captain Williamson described the flame as a lazy flame and the flame he saw might be a lazy flame; and the flame this man saw at the same place later on might be different.

40 THE COURT: Mr. Smith's question to the witness seemed to me to be a mere logical statement of the consequence of the last answer which the witness made, and has no reference as far as I can understand so far as the question goes to Captain Williamson's evidence. I quite understand what you say as to the effect of the evidence and the weight of it, but the statement which Mr. Smith put into his question was a complete sequitur.

MR. WOODS: Might I ask to have the question read?

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 18.
Alfred
Hargrove,
Cross-Ex-
amination
continued.

THE COURT: I have no doubt he intended to have reference to it. But as a question you will find that what I say is right; the witness having given his reasons of course in answer to cross-examination of questions and then Mr. Smith puts the supposititious case with the hypothetical case "then if those reasons are not present then your reasons for saying so and so are gone." That is all that was done.

MR. WOODS: I will take your Lordship's memory more than my own on that but my impression was, the way the question was put, was not supposititious in fact but the impression left was that it was not supposititious but because Captain Williamson said this, that and the other thing, and my suggestion to your Lordship is that that is the impression left on the witness's mind and therefore it could not be regarded as a supposititious question and was not supposititiously put. 10

THE COURT: We will have what the Court Reporter has taken down. (Question read).

THE COURT: Of course this is cross-examination. I can understand the argument that you advanced as to the weight of the evidence.

MR. SMITH: Perhaps you will answer that question.

THE COURT: If the reasons you have given for the opinion you have expressed that what you are speaking of now was a gas flame, are not present, what is your answer? A. My reasons for giving it was a gas flame was because it was burning without any appearance of the lath burning. I could not see no red with it. Wherever fire is you always see a certain amount of red and that seemed so distinct from there. 20

Q. MR. SMITH: Your view, then, is that gas always burns blue flame? A. No it is not my reason. I have always found blue with gas, a certain amount, and orange and white.

Q. Always? A. Always.

Q. Did you ever use a Bunsen burner? A. No. 30

Q. Did you ever use a kitchen range where there is gas? A. Yes, for the last five years.

Q. Did you ever turn it on without any air without opening your air? Come on, chief. There is not a sign of blue about it? A. I have attended seven gas fires before I attended this one and I noticed blue.

Q. I was asking you about your range and if you ever turned it on without the air. Have you? A. No, I have had no experience with that.

Q. Now I want to talk about this kitchen. Is your brigade supplied with lath and plaster hacks? A. Yes.

Q. And you thought you saw a gas flame in this wall? A. Yes. 40

Q. Did you take down the lath and plaster above that to see where that flame was travelling? A. The man that put it out had an axe with him. It was ripped off afterwards.

Q. When was that wall ripped? A. I don't know when it was ripped. It was ripped some time. I could not say.

Q. Here you have a flame burning in a wall which you think is gas?
A. Yes.

Q. And you did not take the trouble to rip out the lath and plaster above that to see where it was going? A. Not at that time.

Q. Did you at any time? A. I did not. The men do though.

Q. When did they do it? A. I could not say when it was done.

10 Q. How do you know it was done? A. Because I seen it afterwards.

Q. And when was that? A. Later on. I cannot call to mind every little detail.

Q. And how much of the wall did they take out? A. I could not say. You must remember this, there was a lot of smoke there and I could not see all of it.

Q. Did you see they had ripped it out at all? A. I did not see them rip it out.

Q. But did you see it had been ripped out at all? A. Yes.

Q. To what extent? A. I cannot tell you now to what extent.

20 Q. You do not know whether the opening was six inches wide or two feet wide? A. No.

Q. You don't know whether it was ten feet long or a foot long? A. No, it was not that long.

Q. It was not ten feet long? A. No.

Q. What was it? Five? A. I could not say.

Q. And you later on saw gas over on the east wall of the kitchen, or fire on the east wall of the kitchen which you thought was a gas flame?
A. Yes.

30 Q. And was that ripped up to see where that was coming from or where it was going? A. I could not say whether it was ripped out or not.

Q. You had not issued any instructions that that should be done?
A. I could not say whether I did or not.

Q. You don't remember that you did? A. No.

Q. There is no doubt whatever, is there, that where fire is burning in lath behind plaster that the thing that you first do— A. Is rip it open.

Q. To see where that fire is going? A. Yes.

Q. And you are unable to say to what extent that was done that night? A. I could not say.

40 Q. It certainly was not done when you first discovered that fire?
A. Not when I first discovered it, no.

Q. THE COURT: I would like the witness to describe as far as you can the size of what you call a jet? A. As far as I can remember it will be just about an inch or two in height.

Q. Was it coming laterally from the wall, or how? A. Burning up vertically.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 18.

Alfred
Hargrove,
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta,*
Plaintiffs'
Evidence
No. 18.
Alfred
Hargrove,
Cross-Ex-
amination
continued.

Q. From what? A. From the side of the wall, breaking out and burning up vertically.

Q. About an inch? A. An inch or two inches probably.

Q. About how far up from the wall did it extend? A. Oh I could not give that—how far out.

Q. MR. SMITH: Now as I understand it.

THE COURT: Are you speaking of an isolated jet such as you would get if you had a pipe in the wall? A. Similar to that, similar as if it was coming from a pipe.

Q. MR. SMITH: And only one or more than one? A. There was 10 only one I noticed at the back of the coffee urn.

Q. On the south wall. One or more than one? A. It appeared in two or three places. I am not certain.

Q. How far apart? A. Probably five or six inches apart.

Q. Was the door in the south wall burning when you first went in—the door leading from the kitchen to the lane? A. No.

Q. I do not mean the basement. I mean the door, as you will observe, leading from the kitchen to the lane? A. I did not notice no fire there.

Q. If that door were burning there is no doubt you would notice it when you went in there? A. Yes. 20

Q. You would not have any doubt about that. A. No I never noticed any fire there at all.

Q. I mean you put out the fire in the wall or you got the hose from Williamson or the chemical and put it out? A. Yes.

Q. And if the door had been on fire you would have put that out too? A. Yes.

Q. And Mr. Mayo was through there just a few minutes before you were. His statement is that that door was burning and it extended across the door and he did not know whether it had reached the walls or not. You both cannot be right about this fire. A. It had been burning while 30 Williamson was in there. He was in there before me, you must understand that, and he had started using the chemical before I got to the back.

Q. You think the door may have been on fire? A. Yes.

Q. Did you look at the door to see whether it was on fire? A. There was no sign of fire and there was no need to look at it.

Q. And you as an experienced fireman would no doubt generally look over that kitchen pretty carefully? A. Yes.

Q. And you did not notice whether there had been fire on the door at all? A. No.

Q. And Williamson has told us that he put out the fire on the wall 40 from which plaster had dropped, in the place from which plaster had dropped, and that is the fire he put out there? A. Yes.

Q. And you did not notice any fire on the door? A. I did not notice any fire on the door.

Q. And you made some statements in this case, one on the 22nd of February to Mr. Booth and Mr. Ward. And you later made a statement on the 31st March, I am speaking of 1932. And who did you make that statement for? A. Which one?

Q. The one in March of 1932. Your statement on the 22nd of February was to Mr. Booth and Mr. Ward and the second one I have it, but I was wondering who you made it for? A. Made it for Mr. Friedman.

Q. That is Mr. Friedman who is in this case? A. Yes.

10 Q. And I suppose that you have been in consultation with some persons about this lawsuit since making that statement? A. Consultation? What do you mean?

Q. You have been conferring with them and talking to them about the evidence which you should give in this lawsuit? Perhaps you misunderstand me? A. Yes.

Q. Has anybody seen you or have you seen them to talk about this fire? A. Yes, Mr. Friedman.

Q. I suppose that is quite recently? A. Yes last week.

Q. And where did you see him? A. In the chief's office.

20 Q. Were the other men there who were present at the fire at the same time? A. Yes.

Q. Who were there? A. Who was there?

Q. What others were there with you and the Chief and Mr. Friedman at the time of this conversation? A. All of them.

Q. All the firemen? A. No they were not there all together.

Q. Well most of the firemen present at the Corona fire? A. Well a lot of them.

Q. Well about how many? A. Those that gave statements.

30 Q. And I must say in fairness we have been given copies of the statements which you made.

MR. WOODS: Perhaps you will accept it from me that that is the only time we have interviewed these firemen and got these statements, because it was nearly two years since they gave statements. And that is all of that.

40 Q. MR. SMITH: That is all right. Now just one or two things, chief, and I have finished. You said yesterday that you sent someone back—Airth I think it was, to telephone the gas company to come and shut off the gas service. That is invariably done in cases where gas is served to the burning building. A. No, the impression you are giving now is wrong. I simply sent Airth back to remind him to phone the gas company in case it might slip his memory. It is the usual practice, it is always done at a fire where the gas lines are laid, to notify the company.

Q. Yes I thought so. I just wanted to clear it up. A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 18.
Alfred
Hargrove,
Cross-Ex-
amination
continued.

Q. I suppose you have concluded that the fire which you saw by the coffee urns, that is on the east wall, was a continuation of the same fire Captain Williamson saw under the floor—in the floor? A. To all appearance it did not seem to be the same fire. There was no possible means of knowing whether that was connected with the fire underneath or not.

Q. And there was no possible means of doing that unless you had ripped out the plaster? A. No and then I do not know whether you could have followed it down then.

Q. But you could have seen where the lath had burned from that point? A. Yes. 10

Q. And it was almost in line with the other? A. Oh yes.

Q. And you said something about burning the wall of the linen closet. I want to ask a question about that to see if I have it correctly. The linen closet is on the first floor. I am showing you Exhibit No. 14. Now as I understand it—the linen closet—was there a doorway from the kitchen to the linen closet? A. No.

Q. You go into the place called the dressing room, then you get into a place called the linen closet? A. I believe it is used for linen.

Q. And where is that from the coffee urns? Are these the urns just opposite? A. No, they seem to be at the back. That seems to be 20 wrong according to the way my memory serves me.

Q. All I want to get into my head is that the flames which you saw in the linen closet were in the same wall as the flames which you saw in the coffee urns. Just look at the plan, which is very plain, where you marked this fire? A. Yes.

Q. And where you said you saw blue flames and the discussions you and I had about them in the one place will apply to all? A. Yes.

Q. And you spoke of fighting more than once the fire on the bottom side of the kitchen range, and if I understood you correctly you never succeeded in putting that fire out. A. Which? 30

Q. On the bottom side of the stairway landing just outside the kitchen door. A. Men was working there putting it out. It was put out several times.

Q. All right, as many as you wish for the moment, but what I am coming at is this, you have given evidence that you know of that being done twice? A. Yes.

Q. So the "continually," so far as you are concerned, will rest with two occasions? A. Yes.

Q. And on the second occasion did you succeed in putting it out? A. Yes we put it out again. 40

Q. It was out? A. Yes it was out.

Q. It was something you could see. There is no question it was put out? A. No there is no question.

Q. And did it light again? A. The last time I see it was before I went to the front. We were working some place we had put out before.

Q. And you think there was gas around there. It was one of those gas places I suppose in your judgment which was impossible to put out permanently? A. Yes.

Q. And there would not be any doubt—the landing was made of wood? A. Yes.

Q. And that is one thing there would not be any question about, that would burn up in the fire. You would not have any doubt about it? A. Yes.

10 Q. And if that landing, after the fire was over, was still there and only charred and if the joists holding it were still there—the wooden joists—you would probably change your idea about that being burned by gas which could not be put out? A. How do you mean could not be put out? I do not get you.

Q. You told me that was one of the places you thought fed by gas and you could not put the fire out? A. It was put out and put out again.

Q. And it came on again? A. Yes.

Q. And then I said that if you could not put it permanently out that that is no doubt that would be one of the things which would burn up in that building, and you agreed with me. A. I suppose it would burn up.

20 Q. And when I suggest to you it did not burn up then you must conclude it was not supplied by gas lighting and re-lighting and so on. It was there when the fire was over? A. No I would not say that.

Q. It seems to me quite logical. A. The line was kept constantly all through the night when the fire was on—working. The line hardly left there.

Q. You fought this fire from the bottom. It was the bottom of the landing that was burning and that is where you went down and fought it? A. Yes from the steps.

30 Q. And you were not in the basement while the fire was destroying the Corona building. You were only there once at the foot of the stairs? A. Yes.

Q. And it got hot in the basement later on? A. It got hot while we were there.

Q. And it got hotter? A. Yes.

Q. And there was a time when nobody could possibly live in that basement? A. Yes.

Q. And this was one of the spots to which gas was constantly fed, would it strike you as very surprising if that landing did not burn up?

MR. WOODS: Is my friend saying it did not burn up?

40 THE COURT: If it did not burn it.

MR. SMITH: It would be a surprise to you if that did not burn up? A. Yes.

Q. And if we find it not completely burned but the joists still there

and only charred then you will perhaps change your idea that that was fed by a gas flame which could not be permanently extinguished?
A. I claim that the fire was fed by gas all through the night.

Q. I know you do. There is no question about you thinking that. I am speaking of this one place which you are sure was fed by gas and I will say to you you will probably admit you are wrong if in fact that landing was not completely burned up? A. No I won't admit it.

Q. Why? A. Because it does not prove the gas was not there and was feeding the fire.

Q. What you have said was that at the bottom of this landing, continually as my friend said, several times as you said, and then twice as you told me, and then re-lighting a third time, that you could not put the fire out at that spot permanently, then of course that piece of wood would be one of the things which would be sure to be completely destroyed? A. Part of it would. It all depends on what was left there. Wasn't there any of it burned?

Q. Well I can say this to you that all the joists were still there.

MR. WOODS: Wouldn't it be fair to say "assuming"?

THE COURT: Wouldn't it be fair to say "assuming?"

Q. MR. SMITH: Assuming the wooden joists were there after the whole hotel was destroyed? and assuming that they are only charred, won't you change your mind about that spot being constantly fed by gas? A. No I won't.

Q. And I suppose you would be equally independent with all the opinions you have expressed? A. Yes. Another thing too—I told you lines were played there all night and that would have some check on burning it completely. There was sufficient lines at the finish playing on that.

Q. This fire completely gutted and destroyed this hotel? A. Yes.

Q. And that was the sort of fire I am talking about in which this wooden landing was? A. Yes.

THE COURT: Did you say there was more than one flame coming out of the kitchen wall which looked to you like a gas jet? A. Yes, probably two or three.

Q. And they were coming through openings in the wall? A. Either openings or cracks in the walls.

Q. And how big were those openings or cracks? A. Oh I could not tell you that. It was too smoky.

Q. MR. SMITH: Were the lights on in the kitchen when you got there first and saw these blue lights? A. No lights.

Q. Now are you sure about that? A. I am not sure but I did not notice any lights.

Q. You are not sure about it? A. No.

Q. Smoke coming from these coal holes when you opened them outside—was it quite black? A. Yes.

Q. In your experience you have seen something else burning besides gas? A. Oh yes.

Q. Are you going to say nothing else but gas was burning in the coal holes? A. No.

Q. The coal was burning wasn't it? A. Yes.

Q. And that is what caused the black smoke? A. Yes, naturally and
10 water was played on there too.

Q. From the lane outside? A. Yes.

Q. Did you at any time say or did you hear Chief Dutton say to anyone in the hotel not to remove things, that the matter was under control?
A. No.

Q. Did you tell that to any of the guests? A. No. I will go over that again. When I arrived there the night—

Q. I know that part of it. I am merely asking a simple question?
A. No I did not.

Q. Did you hear Chief Dutton do so? A. No.

Q. You never heard him? A. No, and he never was in the front at
20 that time neither. He was in the back.

Q. Did you meet a man by the name of Scott, a guest in the rotunda of the hotel, to know him by name? A. No I do not.

Q. When you came down to the hotel I suppose you saw the clerk or the manager in the office? A. I saw what appeared to be the hotel clerk.

Q. Mr. Mayo? A. I don't know his name. He just spoke to me.

Q. And did he tell you there had been an explosion? A. No. I just
30 asked where the fire was and he merely said to the rear, and that is all the information I got.

RE-EXAMINATION BY MR. WOODS.

Q. How long have you been a fighting fireman? A. About twenty-three years in the department.

Q. And did you see a fire such as you have described on the south wall of the kitchen, the one you saw when you first went in, and we will assume for this purpose that the plaster was away around that fire and you have described to this Court as being like a jet coming out and going up the wall and about two inches or an inch, you could not be
40 sure— A. No.

Q. Have you any doubt of your ability to tell whether that fire was a fire from burning gas or was a fire from the burning of the lath?

MR. SMITH: I want to object and I do want your Lordship's ruling. This was something that was completely covered by my friend in his

*In the
Supreme
Court of
Alberta*

—
Plaintiffs'
Evidence

—
No. 18.

Alfred
Hargrove,
Cross-Ex-
amination
continued.

Re-Exam-
ination

examination in chief. And I cross examined on it and surely that must be an end of it. It is not, with respect, re-examination.

THE COURT: I did not gather from the examination-in-chief of this witness that Mr. Woods was at that time putting him forward as a person who could give evidence on such a matter as opinion evidence. He is now, I take it, doing so arising out of your cross-examination. There is no objection to it and if there were I would and should prevent it. Do I understand your view aright, Mr. Woods?

MR. WOODS: No, my Lord, and if that is so I will withdraw it. I had no intention of tendering him as an expert. I asked the question 10 because it was in answer to my learned friend and it was my learned friend who brought out from this witness that this fire that was coming out of the south wall, that the lath was not burning and I am re-examining on that point and not on any question of opinion and I have no doubt your Lordship has been very kind in indicating to me that it might be suggested I was giving opinion evidence which I do not intend to do at all.

THE COURT: I thought counsel would see why I made the statement and I think, Mr. Woods, it is very doubtful, the position you put yourself in.

MR. WOODS: Well I do not want to ask the question in that way 20 if it puts me in a doubtful position because under the limitations of the statute one must do one's utmost not to put anything that may be the basis of cutting out a very important witness. My friend said the witness said that this lath was not burning. Now I want to know whether he can tell whether if the lath was burning there would be some sounds or sparks or something he could tell it was burning, or crackling. Your Lordship asked questions on the subject and I thought I would get information also but I do not want to put myself in the category of calling opinion evidence.

THE COURT: Perhaps you will remember the occasion when the 30 Bar had a very sad experience about doing what I think you might possibly be doing. I think it is so doubtful that I prefer not to have to rule upon it.

MR. WOODS: There was one matter my friend took up at the beginning of his cross-examination and the cross-examination was extended a little, but I want to reconstruct it. He took you to the point where you had gone into the front of the Corona Hotel? A. Yes.

Q. And had, as you told us, found some men there but thought it was at the back of the dining room? A. Yes.

Q. And then you went into the front of the Motor Car Supply door? 40
A. Yes.

Q. And you could not get beyond a certain distance and the fire at the rear on the ground floor was going there so strongly that you could not have your men as close to it as you had got your men, as close to the fire in the dining room of the Corona— A. Yes.

Q. And having carefully and truly got you there he asked you something of this character, whether the fire had advanced more in the Motor Car Supply part of the place than in the hotel. Now I cannot remember your exact answer, but whatever answer you did make to him, did you or did you not have reference to that part of the hotel that you and he were talking about, that is the front part of the hotel and had you any reference to the back part? A. No reference to the back end.

Q. I just wanted to clear that up—legitimate. My friend took you over the matter of when you went down there to the fire first and went down to the basement and Captain Williamson was at the bottom of the steps and there was apparently a considerable amount of smoke over towards the coal bins and he could not see any fire there but apparently saw smoke there and you then, under your instructions—he came up and you went along the lane and endeavored to get down the elevator shaft in order to approach what might be a fire and apparently was a fire in that neighborhood that was giving out all the smoke? A. Yes.

Q. And apparently afterwards the smoke must have cleared away to some extent because as my friend pointed out to you later on the fire peopled walked there. Now did you or did you not open the coal chutes? A. I opened them.

Q. And did smoke come out of those coal chutes? A. Yes.

Q. And would the fact of the opening of the coal chutes in the lane take away from the amount of smoke that was at the south side of the building as described? A. It would help to ventilate the basement, yes.

CROSS-EXAMINATION BY MR. SMITH

Q. MR. SMITH: I am going to ask leave to ask a question in connection with it. You agreed with Mr. Woods that the opening of the coal chutes would bring smoke out into the lane and decrease the amount of smoke in the basement? A. Yes.

Q. No doubt about that? A. Yes.

Q. And if you had seen that there would have been no difficulty in going from the stairway in the direction of the elevator especially with your lines and fighting the fire from there if all the smoke were removed?

A. Not all the smoke was removed, but it helped to remove it.

Q. It was removed when Kinsman and McGregor went to fight it? A. Yes.

Q. And there was a time when that fire could probably have been fought from the front? A. Yes.

*In the
Supreme
Court of
Alberta,*

Plaintiffs'
Evidence

No. 18.
Alfred
Hargrove,
Re-Exam-
ination
continued.

Re-Cross-
Examina-
tion.

No. 19.

Evidence of Warner C. Browning.

Plaintiffs'
Evidence

No. 19.
Warner C.
Browning
Examina-
tion.

WARNER C. BROWNING being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. You are a fireman at No. 2 station? A. Yes.

Q. And you went to the fire on what implement? A. On the ladder truck.

Q. You went to the front of the hotel? A. Yes, sir.

Q. And when you went through the hotel, did you—you went into 10 the front door? A. Yes.

Q. And into the kitchen? A. Yes.

Q. And what happened after that? You met one of the men, did you? Did you meet one of the other firemen there? A. Yes.

Q. Who was he? A. Mr. Airth.

Q. He had driven the deputy chief to the fire? A. Yes.

Q. And had gone there with the deputy chief upon his arrival. And when you met Airth what did you do with Airth? A. Well when I met Airth he was recovering from the effects of smoke and I took a hold of him and led him back to the fresh air. 20

Q. He is just a driver and is not accustomed to fire the way you people are? He is a motorman more than a fireman? Anyway, he was suffering from smoke and you took him back and got him some fresh air? A. Yes.

Q. And it did not take you long to do that. You went back through the lobby into the kitchen? A. Yes.

Q. Did you go through the dining room into the kitchen or did you go the other way? A. I could not say for sure.

Q. Anyway, you did get to the kitchen? A. Yes.

Q. And before I get there. Was Deputy Chief Hargrove in the 30 kitchen when you got there? A. Well I met him about the middle of the door.

Q. You got to the kitchen and what did you see when you got there? A. When I got there there looked to be electric light fixtures as if nails had been pulled out and I could see the reflection of fire up through the joists that was on the south wall of the kitchen.

Q. And between the cracks or between some apertures you could see the reflection of fire behind the wall as it were? A. Between the plastering and the wall.

Q. When you speak of the wall you mean the brick wall? A. Yes. 40

Q. There is a brick wall and inside the brick wall there is a lath and plaster place that made the wall of the kitchen? A. Yes.

Q. And your impression was that this light which you took to be fire was between those two places. And what did you do when you saw

that? A. I got hold of an axe and I picked into this wall with a fireman's axe and when I pulled my axe out there would be a sort of a blue flame would come out from every place I would hit it.

THE COURT: Where are you speaking of now?

MR. WOODS: The south wall of the kitchen, the very place we have been talking to Hargrove about.

Q. And what you did when you got back there, having seen Airth out of the front of the place to get a breath of air, you came back to the kitchen and you saw this reflection behind the lath and plaster wall and
10 you took your hatchet or axe—what was it? A. A fireman's pick-axe.

Q. A thing you worked with one hand or two hands? A. Two.

Q. And you cracked it into the wall, the south wall? A. Yes.

Q. Around in the vicinity where you saw this reflection of fire behind? A. Yes.

Q. I don't suppose you can tell us now how many times you did that? A. No.

Q. Was it more than once? A. Yes, quite a number of times.

Q. Quite a number of holes you made? A. Yes.

Q. And I suppose some of the plaster came away? A. Yes.

20 Q. And when you did that and the pick went into the wall you were describing to us a flame that shot out? A. Yes.

Q. And just describe it again for the benefit of the Court. A. I struck in with the pick-axe and back to take another stroke and blue flame would come out through this hole I had picked with the axe.

Q. And did it seem to come out under any pressure, or could you tell? A. Yes, there was pressure behind it, from the way it would come out.

30 Q. Could you give the Court an idea? I do not want you to advance your memory more than you really can, but how long were those blue flames that you saw coming out? A. I should judge that these flames would be from two to three inches as near as I can remember.

Q. And that being so what did you do about those flames and holes you had made with your pick? A. I was up on a table. There was a table happened to be there.

Q. How high were these up? A. Oh they would be, I would judge, about four feet up. They were just about my middle when I was standing on the table.

Q. You are not a very tall man? A. No.

Q. And what did you do then? A. I got hold of a chemical line.

40 Q. The chemical line we have it in evidence already, it was being used down on the basement steps by Captain Williamson at the time and we have it in evidence that Deputy Chief Hargrove sent down after it. Was that the time that it came up to you or did you go down and get it from Williamson? A. Somebody gave it to me but I could not say who it was that gave it to me.

Q. And what did you do with the chemical? A. I put it in these places where I hit the pick-axe in and I would go from one place to the other to put it out, I think between the joists.

Q. And did you seem to get it out as far as your observation went? A. I think I had it out and it would go to another place and flash out again.

Q. That is while you were at that? A. Yes.

Q. And did you get the chemical and go to another place? A. Yes.

Q. And did you get them all out finally before you left, can you remember? A. Well I cannot answer that. 10

Q. And then where did you go? A. I went outside.

Q. Through the kitchen door? A. Through the south wall. I took it to be the kitchen door.

Q. You went out by the basement door did you? A. There is a door that leads down to the basement, goes in through the back, and it turns into the kitchen. That is the door I went out.

Q. And when you went out there what flames did you see, if any, in the back lane? A. I saw blue flames along the south wall.

Q. Well on either one or both sides of the sill of the door? A. One side. 20

Q. Which side? A. That would be west of the door where I came out.

Q. And where were they in relation to the back wall? A. Well I took it to be pavement at the time where it joins up against the brick wall and they were coming up along with the crevice.

Q. In the crevice between the pavement and the south wall? A. Yes.

Q. And how high were they coming up? A. I should judge they looked to be eight or nine inches, something like that.

Q. Well you are putting your hands at about a foot? A. Something like that. 30

Q. And did they seem to be steady? A. Yes they seemed to be steady.

Q. And before we leave this, did you see a similar kind of flames either in that place or along the south wall to the east or west of there coming up east of the door during the night? A. No I don't remember.

Q. And when you came out of the door you saw these stones and you saw some men working there did you? A. Yes.

Q. What were they doing? A. They seemed to be—I took it they had a pick or an axe or something and were chopping along in the ice next to the wall. 40

Q. You mean they were not firemen? A. No they were not firemen.

Q. There were some men there picking with ice picks along the ice in the lane at the time? A. Yes.

Q. Did you take any action yourself about trying to put the blue flames out you saw to the west of the doorway? A. Yes, sir, there was

a hose line and water coming through and I took this hose line and opened the nozzle and put it along the side of the wall.

Q. And how did the flames act after you had done that? A. It put the flames out and they took the hose line off some place else and they were back again.

Q. Just as bright and as good as ever? A. Yes, sir.

Q. Did you do that more than once? A. Yes quite a number of times—two or three times I would say.

10 Q. And the men you mentioned were working there? A. They were doing something picking the ice away.

Q. And were these flames bothering them, could you tell, or did you have to put them out? A. Yes it seemed to be bothering them.

Q. And did the men ask you to put them out, the men who were doing the ice picking, or do you remember? A. I do not think I can answer that.

Q. And then you got orders to go somewhere else—to go to the basement did you? A. No. There was a hose line being pulled down to the basement.

20 Q. Well did you go down there? A. I went part way. That would be I should judge a step or two as near as I could say, in the smoke.

Q. That is down these basement steps? A. Yes.

Q. And what experience did you have when you got to that place? A. Well I did not have much for I was not in a position to see. I was at the back and there were men ahead of me.

Q. But you were on the steps? A. On the steps or the platform.

Q. Did you hear anything in the way of sound, I don't mean the ordinary sounds that firemen make when they are fighting fire, but any other sound that struck you at that time, that is noteworthy? A. Yes.

30 Q. What was it? A. It was like an explosion—combustion, a sort of a heavy puff.

Q. A slight explosion? A. Yes.

Q. And did you see any flames then? A. No I did not.

Q. At what part did you hear this? A. As near as I can remember it was off to my right, from the sound.

Q. You would be standing as far as you can remember? A. I would be standing facing the north.

Q. You would be standing either on this platform or a step or two down and this sound would be off to your right as far as you can tell us now? A. Yes.

40 Q. And what did you do afterwards. Just trace your own movements? A. As near as I can remember there was a line coming through the back door and we turned to come up a place twenty-five or thirty feet, we turned to our right and there was a coffee urn setting on there and I could see other flames around that coffee urn.

Q. But before you got to the coffee urns had you gone back to the

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 19.

Warner C.
Browning
Examina-
tion.

continued.

lane? Had you gone back to the outside into the lane and fought fire?
A. I cannot remember whether I did or not.

Q. Can you remember whether having been inside as you have stated in on the basement steps or at the landing, whether you thought these blue flames that you have mentioned that were on the west side of the doorway after that with the hose and put them out again? A. No I cannot remember that.

Q. But you were going on to say that you remember going into the kitchen where the coffee urns were? A. I took it to be a sort of dining room or corner or kitchen. 10

Q. This place you mention about the coffee urns where you saw the blue flame—was it in the same room as the kitchen, do you remember? A. I could not say to that whether it was in the same room or not.

Q. But anyway, you saw blue flames shooting out. Or describe them again? A. They seemed to be around in the wall where the coffee urns was.

CROSS-EXAMINATION BY MR. SMITH.

Q. Can you place the time you got to the fire? A. I could not.

Q. Did you come on the first or second call? A. The first call.

Q. Who did you come with? A. With the ladder truck. 20

Q. And that would be following district chief Hargrove? A. Yes.

Q. And there is no doubt at all that you got there and you went immediately into this building at the front? A. Yes.

Q. And you made your way to the back? A. Yes.

Q. And before you got to the kitchen you met Deputy Chief Hargrove. As I get your answer? A. I met Bill Airth first.

Q. And you took him out and then you went back and you went to the kitchen with District Chief Hargrove? A. Well I went to the kitchen. I would not say where I left Deputy Chief Hargrove. I met him though in this place about the centre of the building. 30

Q. And didn't he go back to the kitchen with you? A. I would not say who it was, whether he stopped or what it was, just then.

Q. What I want to get at is, who was in this kitchen with you fighting that fire when you first were fighting the fire in the kitchen? A. I could not say.

Q. The Chief might have been there? A. He might have, yes.

Q. And were you fighting flames in the kitchen with the chemical at the time the chemical was brought up or handed up by Williamson from the stairway to the kitchen? A. Well I do not know who handed it.

Q. What we have learned is this, that flames were found in the kitchen and Chief Hargrove sent for the chemical or called for it and it was on the stairs with Williamson and he said Williamson handed up the chemical and gave it to you and you put the flames out? A. Well I could not say who it was, but somebody gave it to me. 40

Q. But what I am trying to get at is there were other firemen with you in the kitchen at that time, or were you alone there? A. There might have been. I was not paying any attention to who was with me. I was working at the line.

MR. WOODS: Williamson at that time was down on the basement steps. Hobbs the driver had got off his machine and Constable was with Williamson on the basement steps. Hobbs, I take it, was behind them. A. He may have been on the landing but whether he was in or Williamson was in or Constable was in the kitchen at just exactly the time—I do
10 not think he was.

MR. SMITH: That is my view and I was endeavoring to find just which of the occasions he was in the kitchen with this axe.

Q. You cannot help me either as to who was in the kitchen? A. Well there was firemen with slickers on and I could not tell you.

MR. WOODS: The nearest is he followed and went back to the kitchen after he saw Airth out to the open air.

Q. MR. SMITH: All you can say is there were firemen in there with slickers on and you do not know who they were? A. No, I do not.

Q. And you cannot remember who they were? A. Yes.

20 Q. And you got on to a table? A. Yes.

Q. The table was against the south wall? A. Somewheres near the south wall.

Q. There was no plaster off the south wall when you got there was there? A. Well I could not say to that whether there was or not. It looked to be off in places. There would be small holes.

Q. Did you notice any quantity of plaster had fallen on the floor of the south wall? A. No I can't say that I did.

Q. And you say you saw flames or fire light through the cracks in the plaster and you got the impression the fire was burning between
30 the plaster and the brick wall? A. Yes.

Q. And those cracks are ordinary cracks in the plaster of a crack behind a light fixture? A. I could not say just what it was but I could see it in the walls.

Q. And I mean it was not any large opening you saw this fire through. It was very small. A. Yes.

Q. And I think we can probably safely assume that by the time you got there no plaster had fallen off that south wall? A. Well I could not say whether there was or not. I only noticed the one place and I could not say whether there was any plaster off or not.

40 Q. And then you did knock some plaster off? A. Yes.

Q. And that was the south wall? A. Yes.

Q. And when you knocked the plaster off the wall the flames which were in behind there came out of the wall? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence.

No. 19.
Warner C.
Browning.
Cross-Ex-
amination
continued.

Q. And then you put your pick in again and knocked some more plaster off the wall? A. Yes.

Q. And flames came out through that opening? A. Yes.

Q. And how many times did you put your pick in? A. I could not say. I was chopping away there.

Q. Did you chop a line clear around the fire you could see? A. No.

Q. Did you ever reach the top of the place where it was burning?
A. No I don't think so.

Q. And was any effort made by anybody to your knowledge — I suppose you were using a lath and plaster pick? A. Yes, an ordinary firemen's axe I was using—a fireman's pick axe— 10

Q. And so far as you know did anyone ever get above that fire by stripping the lath and plaster in that kitchen? A. That is all I saw that time.

Q. And you don't know whether you put that fire out or not? A. No, I do not.

Q. And your next move from there was to go outside. I think you went outside after that? A. Yes, sir.

Q. And were you back in there again that night? A. Not that I can remember. 20

Q. And you went outside not knowing whether the fire was out in the kitchen or not, and did you leave no instructions to anyone? A. No, sir.

Q. You just went on your own? A. I went on my own because I had to go.

Q. It got too hot? A. Something that was making me dizzy and I could not stay any longer.

Q. You left. Did the others remain there? A. I could not say to that. I was looking to get out.

Q. You were in bad shape? A. Well I did not want to get that way. 30

Q. And you do not know whether the others remained in the kitchen when you left or not? A. I could not say.

Q. And so far as you remember you were not in the back end of the building that night? A. I went through the back end of the building after that.

Q. And went up there? A. Went up about half way.

Q. Who with. Who were with you? A. There was only one man I can remember was there. There was two or three but I only remember one man.

Q. Who is that? A. Deputy Chief Hargrove. 40

Q. And how far did you go? A. Well about half way, I cannot say the distance, but where the coffee urn was.

Q. And was that in the same kitchen where you put your axe in before? A. Well there was a partition in between them as far as I can remember.

Q. And in any event when Hargrove was at the fire by the coffee urns you were with him? A. Yes.

Q. And what did you do after that, where did you go? A. Well I don't just remember whether I went through the building or whether I went around, I could not say but I think I went right through towards the front.

Q. And did you fight the fire from then on? A. Yes.

Q. You were not back in the rear? A. I was not after I went on through towards the front—I was not in the back part.

10 Q. And did Chief Hargrove go with you to the front? A. I could not say.

Q. I think you were one of the men who played a line into the main dining room? A. Yes, I took it to be the main dining room.

Q. And you took that from Chief Hargrove. He told us he had the men bring a line in from the front and play it on the back of the main dining room? A. Yes.

Q. And you and Chief Hargrove were on the coffee urn in the same building? A. Yes, I remember him at the coffee urn.

20 Q. Was there anything unusual about the fire at the coffee urn?
A. Well I thought the flame was coming up in the wall where the con-
nection went off.

Q. I do not suppose—there is not much doubt that flame was coming up that wall. Have you any? A. I do not get you.

Q. You said you thought the flame was coming up the wall back of the coffee urn? A. No. I could see a little hole in there where I could see a blue flame there. I could not say it was going up the wall.

Q. Was the plaster off at this place? A. I cannot say whether it was plaster or what it was.

30 Q. Was the blue flame coming out from the wall or did you see it
inside? A. Well it looked like passing something—

Q. But inside the wall, is the point I want. A. I took it to be inside.

Q. You saw no blue flame outside the wall behind the coffee urns?
A. No not outside the wall.

Q. And the time you speak of this puff. At least I read the word "puff." Does that describe it? A. Well I don't know how you would put it, but it was a light explosion.

Q. Who was with you at that time? A. I could not tell you.

Q. Who were below you? A. I could not say.

40 Q. And so after that you were in the kitchen with your pick axe, or before? A. I believe that was—I would not like to say whether that was before or afterwards.

Q. And you were unable to tell me whether that was before you were in the kitchen when you were using your pick axe or not? A. I do not remember.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 19.
Warner C.
Browning
Cross-Ex-
amination
continued.

RE-EXAMINATION BY MR. WOODS.

*In the
Supreme
Court of
Alberta*
—
Plaintiffs'
Evidence
—

No. 19.
Warner C.
Browning
Re-Exam-
ination
continued.

Q. I gather your movements as you have given them, are that you came first to the kitchen after taking Airth outside to the front and you put these holes in the wall, you were standing on a table and then you had to go outside. You were not ordered to go to the back. You mentioned—did you get dizzy? What was the—were you affected by anything while you were there? A. Well something, I could not say what it was, I felt as though, well I was weakening and I thought I was not doing any good there and I had to get outside to get the fresh air.

Q. But was it while you were standing on the table picking at these holes through which these flames were coming out as you have described, 10 that that feeling overcame you? A. Yes.

MR. SMITH: Surely you do not mean that. You said you took the chemical and put these things out? A. Yes.

Q. So it was not after you picked the holes with it that these flames were coming out that you were overcome? A. Well they would not go out. They were at one place and another.

Q. That is while you were using the chemical? A. Yes.

Q. But it was after using the chemical you did go out? A. Yes.

MR. WOODS: Yes, I wish to correct my question in that way. What you did was to hit at these places with the pick and you afterwards threw 20 the chemical on it? A. Yes.

Q. And you were still standing on the table? A. Yes.

Q. And it was immediately after you had gone through that operation that this feeling you have described overcame you? A. Yes.

No. 20.

Evidence of Archie Campbell.

No. 20.
Archie
Campbell,
Examina-
tion.

ARCHIE CAMPBELL, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. You came to the fire on the night of the 21st February, 1932, to 30 the Corona Hotel? A. Yes.

Q. From No. 2 station? A. Yes.

Q. You were the driver of the aerial ladder? A. Yes.

Q. And you parked that ladder in the front? A. Of the frame—yes.

Q. Immediately to the west? A. Of the Corona.

Q. And you went into the hotel, eh? A. Yes, went right through.

Q. And what did you do? A. I went in the front door and I saw the clerk at the desk. The chief driver was talking to the clerk and I asked the

chief driver where the fire was and he said it was right at the back in the basement. I continued on right through the kitchen. I went into the kitchen.

Q. And to the landing and down into the basement? A. Yes.

Q. Who was down there in the basement at the time you got there?
A. Captain Williamson.

Q. What equipment did he have with him down there? A. A chemical line.

Q. When you got there, that was? A. Yes.

10 Q. And what did he do? A. He asked for an axe, and the combination was just outside in the lane and I went outside and got the axe and came back in and went down to where Captain Williamson was and I started chopping. There was a whole piece came right out the same as if they had a little doorway there or something.

Q. And you did the chopping? A. Yes.

Q. And the whole piece came out together? A. Yes.

20 Q. Before opening up that hole did you see any flames back there?
A. There was a little on the beam there. That was the only place. Of course I was not down when he called for an axe because I went and got it and chopped.

Q. And having got that whole piece out could you see any fire from there? A. You could see along the south wall.

Q. Well now, let me get orientated. A. You could see west of the stairway from the west lane.

Q. And that would be inside? A. Yes.

Q. Is that underneath the kitchen floor? A. Underneath the kitchen floor.

30 Q. Well did you fight that fire or did you see it after, with a hose?
A. Yes, we put it out with chemicals. One man could handle the chemicals.

Q. But before the chemical was handed up? A. Yes.

Q. So underneath the kitchen along the south wall and underneath the kitchen floor, between the kitchen floor—A. It was west of the stairway.

Q. Underneath the kitchen floor there is a space and then there is the unexcavated ground? A. Well the smoke was so thick I could not tell you.

Q. And as far as you know you got the fire out with the chemical?
A. Well you could not see any more flame.

40 Q. And you handed the chemical up to Browning? A. Yes, sir. We could not see them but we could tell by their voices. I am not sure it was District Chief Hargrove called for the chemical line.

Q. And as near as I have it Browning was up on the top of steps further up? A. Yes, he was up and he would pass it up to him.

Q. And the chemical was handed up to him? A. Yes.

Q. And we have traced the chemical into the hands—Hobbs was up there? A. No, I could not see Hobbs.

Q. Well my memory is subject to correction on that. I may be wrong but that was my recollection. Well you went around to see if your aerial truck was all right. After Browning got the chemical? A. There was a line of hose right down.

Q. Oh yes, we have got that. One of the men mentions about going back and attaching this line of hose to the hydrant at 106th Street and he came back with that line of hose while you were still there? A. Yes. We took the hose down and played on the stairway.

Q. And on the place west of the stairway? A. Yes.

Q. And so far as you could see you had got that fire out under the kitchen door? A. Yes as far as I could see. 10

Q. And then you went to see that your aerial truck was all right. You walked around on your feet to the front? A. Yes, I went around the lane then.

Q. And you walked around the block each time and finally you came back? A. Well it was not a block. It was just around to 107th street—half a block.

Q. And when you came back did you come back the same way? A. Oh yes.

Q. You did not go around to 106th Street? A. No. 20

Q. And you went down the elevator shaft? A. Yes I came around there. The chief was there and I saw Captain Williamson down there and the chief asked if I could go down and I said sure, and I went.

Q. And what happened? A. Captain Williamson had an axe and you could see the flames behind the door and it was burning there briskly and the flames went right out and we had no chance to get back if we stayed down there, it was such a small place and the flames chased us out.

Q. And after that you fought the fire through the windows? A. Yes.

Q. And finally you went around to the front? A. Yes, and pulled a line in the front door. 30

Q. And Hargrove had come around there, had he? A. Well it was by his orders.

Q. And were you one of the men he got to fight the fire in the dining room? A. Yes.

Q. And you stayed there, I understand until—A. I stayed there until the fire went through the roof and I got orders to come out and operate the aerial ladder.

Q. For the purpose of operating the aerial ladder on the roof? A. Yes. 40

Q. And when did the roof fall in, or when was it? A. Well the time at a fire is very deceiving—I could not give you correct time of that.

Q. The roof did fall in? A. Oh yes.

Q. And after that you were at the back of the building during the night? A. Yes, I came back and was back about one-forty. I was in front operating the ladder all the time.

Q. And it was after one that you got back? A. Yes.

Q. And what did you observe if anything in regard to any flames along what had been or the remains of what was the south wall of the building? A. I did not observe very much until I was sent back to relieve some of the men between three and four.

Q. And tell us what you observed? A. I was operating a line along east of where the stairway was and it was all bricks and there was a blue flame jumping up and down and if you put it out in one place it would re-light again, and that is all I know. And I was only there a short time until I was ordered to go and look after a frame house.

Q. And was there anything to burn? A. Not that I could see, just the brick and mortar.

Q. And how high were they—these places? A. Six or seven inches.

At 12:30 Court Adjourns till 2:00 p.m.

At 2:00 p.m. Court Resumes.

CROSS-EXAMINATION BY MR. SMITH.

Q. As I understood you when you and Captain Williamson went down the elevator shaft the condition was such there that you were unable to use your hose at all on that occasion. You opened the doors, as I understood you and the Deputy followed you and you had to get out as quickly as you could? A. When the door opened the fire came right over our heads and we had not room enough, it was such a small space.

Q. Six by six or something like that? A. Well I could not say. And we had no room and could not use the hose at all.

No. 21.

Evidence of William Blair Airth.

WILLIAM BLAIR AIRTH being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. We have it in evidence already that you drove District Chief Hargrove to the fire; that you came to the front of the hotel and that he, and you followed him I gather, went through the front door and through to the kitchen. Did you go through as far as the kitchen on that occasion? A. Yes, sir.

Q. What did you see in the kitchen in the way of fire? A. Flame in the wall.

Q. What wall? A. That would be the south wall.

Q. And will you be good enough to describe the impression of what

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 20.
Archie
Campbell,
Examina-
tion.
continued.

Cross-Ex-
amination

No. 21.
William
Blair Airth
Examina-
tion.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 21.
William
Blair Airth,
Examina-
tion.
continued.

you saw of that flame. Will you describe it, where it was, and how it acted? A. Well I was only just there a matter of a second or so because District Chief Hargrove sent me right out immediately over to get in touch with the telephone operator to tell him to phone up the gas company to have the gas man come down to shut the gas off.

Q. But during the short time you were there you did see some fire on the south wall of the kitchen? A. Yes.

Q. And how high was it up? A. Oh I imagine probably around maybe between three and four feet.

Q. And can you tell us anything about it at all? A. No I can't. 10

Q. Then during the night of the fire you were, I gather, from time to time in the lane at the back of the hotel? A. Oh I was, yes, around the lane some of the time but I was mostly around the front of the building.

Q. During the time you were in the lane from time to time did you observe any intermittent flames? A. No, sir.

Q. During the whole of the night? A. Not to my knowledge, sir. I don't remember.

No Cross-Examination.

No. 22.
Jasper
Lockie,
Examina-
tion.

No. 22.

20

Evidence of Jasper Lockie.

JASPER LOCKIE being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. You are a fireman attached to No. 2 Station? A. Yes.

Q. And you were at the fire at the Corona Hotel on the night of the 21st February, 1932? A. Yes.

Q. With what equipment did you go to the fire? A. No. 2 pump.

Q. A pump from No. 2 station? A. Yes.

Q. And what did you first do at the fire? A. I helped to connect 30 the hose to the hydrant.

Q. And what did you then do? A. I went to the back of the hotel in the lane.

Q. With the hose? A. Well I followed up with the hose. The pump went ahead of me.

Q. And what did you do? A. I followed up the line to the rear of the hotel in the lane.

Q. And did you notice anything special about the fire in the lane shortly after you got there? A. Well I seen a flame in the lane. That is about the only thing I can recall. 40

Q. Whereabouts? A. A little west of the basement steps.

Q. And where in relation to the wall of the hotel? A. Oh perhaps a foot or fifteen inches, somewhere around there, from the wall.

Q. Do you mean out from the wall or up on the wall? A. Out from the wall.

Q. You mean coming up through the pavement? A. Well it appeared that way.

Q. That is the way it seemed to you? A. Yes.

10 Q. Can you tell me did it have any peculiar appearance? A. Well a sort of bluish flame.

Q. And did you put it out? A. Well, yes, I attempted to put it out. I was there on the line.

Q. You attempted, you say? A. Well we put it out and it appeared up again in a short while.

Q. And did you observe that same phenomenon during the rest of the night? A. Well up till a while—I was not there all the time.

Q. Up till what time? A. Well I could not say. It was a little while after. I was helping to drag the line around.

Q. And you saw it appear again? A. Yes.

20 Q. And did you put it out again? A. We afterwards put it out.

Q. And after you put it out did you notice it appear again, after this time? A. Yes.

Q. You were in the building near two things called the coffee urns, were you? A. Yes, I was in the kitchen.

Q. And did you notice anything special there? A. Well there was flames up the wall seemed to me behind the coffee urns—small flames.

Q. And did you notice anything special about them? A. No nothing particular, just the same sort of flame.

30 Q. What same sort of flame? A. A bluish flame like a gas flame as far as I can recall.

Q. What time did you leave the fire about? A. Oh I could not say what time exactly. It was somewhere around five o'clock in the morning I think.

Q. And up to the time you left the fire, and I believe you had to go and change your clothes? A. Well I went to change my clothes. I could not say exactly what time it was.

Q. And did you come back to the fire after that? A. Yes.

40 Q. Well the time you were away changing your clothes will you tell us you observed these same flames to which you referred as being on the outside of the wall? A. I was a little further east on the building later on.

Q. And what did you see? A. Well mostly smoke coming out of the coal chutes and then I was further east till after the wall collapsed, fighting that end of it.

Q. And did you observe any flames of the character you described

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence.

No. 22.

Jasper
Lockie,
Examina-
tion.

continued.

after the wall collapsed? A. Yes, on the inside of the wall.

Q. Was there anything there to burn, I mean any material other than gas? A. No not that I could see.

CROSS-EXAMINATION BY MR. SMITH.

Q. Just at what point are you speaking of now when you said you could not see anything there to burn. Whereabouts was that? A. That was in about where the Motor Car Supply was, more on the east end of the building.

Q. And did you observe that in any other place along that wall? A. No place but outside the wall. 10

Q. I am speaking of the inside? A. It seemed to be along the wall inside where the wall had fallen in. That was about the only part I was there at.

Q. That was in the basement? A. Well I suppose it would be the basement.

Q. You said where the Motor Car Supply Company was, and there was no excavation near there and I suppose you mean what was the ground floor of the Motor Car Supply Company? A. Well if it was the ground floor it was pretty low because I was leaning in over the window.

Q. MR. WOODS. He is speaking of the time after the wall fell in? 20

MR. SMITH: You mean after the collapse of the wall? A. Yes after the wall fell in.

Q. Which wall? A. The wall on the lane of the Motor Car Supply Company.

Q. There was no basement there and where you saw these flames must have been on the ground floor? A. Well I could not say for that. There was a lot of bricks stood outward, and we were standing on those bricks and maybe it appeared to be a little lower down.

Q. At any rate, this place was back of the Motor Car Supply Company? A. Yes. 30

Q. And this fire that you saw in the lane when you first went there you say was burning about twelve to fifteen inches south of the south wall of the Corona Hotel in the lane? A. Yes.

Q. And with respect to the wall that is from east to west. Whereabouts? A. It was west of the door leading down into the basement steps.

Q. And there was ice of course on that street there? A. Yes, snow and ice.

Q. And the lane was paved underneath? A. Yes.

Q. And these flames were from twelve to fifteen inches from the wall? A. Well it appeared to be that. 40

Q. Approximately? A. Yes, it appeared to be that.

No. 23.**Evidence of Colin Douglas Mackenzie.***In the
Supreme
Court of
Alberta*Plaintiffs'
Evidence

No. 23.

Colin
Douglas
MacKenzie
Examina-
tion.*continued.*

COLIN DOUGLAS MACKENZIE being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. You are the manager in Edmonton of the Motor Car Supply Company's branch here? A. Yes, sir.

Q. And you were at the time of the Corona Hotel fire? A. Yes, sir.

10 Q. And the Motor Car Supply Company occupied premises in that building? A. Yes.

Q. On the east side of the building? A. Yes.

Q. And you have been good enough to make for me a rough sketch from the information you have as to what was contained in the Motor Car Supply Company part of the building, both on the ground floor, the one going in from the street, and in the basement underneath? A. Yes, sir.

20 Q. We already have it that the basement of the Motor Car Supply Company's part of the premises did not go all the way back? A. That is correct.

Q. It was unexcavated during a portion of the way back as shown on the plans already in? A. Yes.

Q. And the place these sketches refer to is the eastern part of the hotel building proper, isn't it? A. That is right.

Q. The most eastern part. And I am asking you — of course you have not drawn these to scale and I suppose you have done the best you can with them, but are they a fairly good representation of the premises, of your premises, as they were at that time? A. They are.

30 Q. The first sheet being the ground floor and the one with your receipt stamp on it being the basement floor? A. That is correct.

MR. SMITH: I take it, you are just showing the relation of one room to another?

MR. WOODS: Yes, without any attempt to draw to scale or exact dimensions or anything of that kind?

Two plans of Motor Car Supply Company premises, marked Exhibit 15.

Q. Now before I get to your personal experience with the fire I want you to tell the Court and explain to the Court the lay-out of your premises as shown on Exhibit 15. The front entrance is on Jasper Avenue? A. That is right.

40 Q. You come in the front door and there is a place called "front display?" A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 23.
Colin
Douglas
MacKenzie
Examina-
tion.
continued.

Q. There is a mechanical department to the left as shown on the plan? A. Yes, sir.

Q. And there are general offices, sales manager and manager's office with a wash room in the general office as shown on the plan? A. That is right.

Q. And in the display portion there is a counter along the back part of that display portion in the relative position as shown on the plan? A. Yes, sir.

Q. And going further back on the ground floor you have a number of shelves, have you, or are those shelves? A. Those are meant to be shelves. 10

Q. And they contain stock? A. Yes, sir.

Q. The kind of stock you carry in your business from time to time here? A. Yes, sir.

Q. I suppose you do not carry a great deal of the stock. Your principal place for Alberta is in Calgary? A. No, we carry approximately the same stock here as we do in Calgary.

Q. Will you be good enough to tell the Court what was on those shelves and what kind of containers you had? A. It would take quite a long time to give a thorough description, but the stock on the shelves on the ground portion of the building is what is commonly known as shelf goods, merchandize in bottles, tin cans, containers of cardboard, containers of wood, little parts, tools, supplies used in garages, equipment, items of that nature. 20

Q. I notice you have marked down here "Shellac" and two places "Opex." What are those and why did you put them down? A. I was asked to indicate on this sketch the location of the items that might be termed inflammable in their nature if they were opened and that is the approximate location of those items. Shellac is a commodity used in garages for the purpose of cementing down gaskets. It is packed in bottles and the bottles again are packed in cartons all sealed. Opex is a lacquer, it is not a paint, but it is a species of material used for painting cars. It is also stored in tin cans sealed and that is the location which was kept in our stock with a further additional supply of larger cans, sometimes kept in the rear. 30

Q. As shown? A. As shown in the rear here.

Q. Where you have marked the words "Shellac" and "Opex?" A. Yes.

Q. And back of that part we come to a place you have marked the salesman's room and the radio department, and back of it, again, in which there was stock as you have stated. And you have marked the place "stairs to basement." Now where in relation to the front door roughly— 40
A. They are approximately in that position.

Q. Were they open stairs? A. Yes.

Q. Going down to your basement? A. Going down to the basement.

Q. And then a little way behind you have "stairs to mezzanine" indi-

cated by dotted line. What was that? Was there a mezzanine floor?
 A. There was a mezzanine floor which we built ourselves about eight feet above the ground floor for the purpose of storing radio sets.

Q. And right at the back you have the shipping platform, that would be right at the back on the ground floor out on to the lane. A. Yes, inside the building.

Q. Did it have a door? A. It had a double door.

Q. And where we have the words "shipping platform" on this page it is near to the very back of the building? A. It is right at the back.

10 Q. And there are car axles? A. Yes.

Q. And you have also marked for me the approximate position of the Corona writing room and the dining room on that part so as to show the relative position with relation to this portion of your ground floor that you have been mentioning? A. Yes, sir.

Q. Now then coming down to the next basement part. I would like to clear that. This cannot be placed in juxtaposition with the other because one is on one sketch and the other on another. A. Yes that is true.

20 Q. I suppose we had better take it by reference to the position of the thing you have marked "stairs." Now those stairs on the second leaf on this exhibit are the same stairs you have marked "stairs to the basement" there, are they? A. They are.

Q. So there are about three rooms in your basement part, I take it? A. That is correct.

Q. And one of those rooms, being the most southerly one, juts out a bit underneath the hotel dining room, does it? A. That is right.

Q. As shown? A. As shown.

Q. And the stairs come down into it as shown? A. Yes.

30 Q. And that is the way you get to your basement? A. Yes. And there is also another stairway here.

Q. Another stairway to the basement on the east side? A. Yes.

Q. And it goes down in the place that is shown here towards the north on the east side of your basement? A. That is correct.

Q. Now have you on that sketch of the basement plan marked for me what stock you kept in that basement? A. Yes, sir.

Q. And will you tell the Court what it is. A. The entire stock kept in the basement consisted of tires and tubes and a small quantity of sundry items in the Firestone line comprised principally of vulcanizing cement.

40 Q. Near the northeast corner? A. Yes, sir, as shown here.

Q. The tires were kept in the place as shown there in this room? A. Yes, and this room as well.

Q. And the front room to the west and also—A. In all three rooms. In addition to that we kept our advertising material in the basement.

Q. And that is simply booklets or pamphlets—paper? A. Yes.

Q. And the toilet is down there too? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence.

No. 23.

Colin
Douglas
MacKenzie
Examina-
tion.

continued.

Q. Now can you give me an idea how far back that basement went with reference to the plan Exhibit 4?

MR. SMITH: I am objecting here. This is something which may be of importance and surely it can be shown accurately. My friend's question was "can you give me any idea how far back this basement went," showing it on a plan which is not accurate and only put in to show the relations of one room to another. It may be of importance and might be established by something accurately.

MR. WOODS: The general accuracy of this plan is admitted. I might be anticipating by putting in a building plan at this stage but I take 10 it that the general accuracy of the walls was admitted when Exhibit 4 was put in.

MR. SMITH: Exhibit 4 was put in with the admission that it did show the relationships of the rooms but it was not put in with any idea of accuracy of dimension.

MR. WOODS: Perhaps I can get over my friend's objection in this way—

MR. SMITH: Well I would like to have it accurate.

MR. WOODS: I have no doubt before we get to the end of the trial we will have it pretty accurate. 20

MR. SMITH: I hope so.

THE COURT: Well why give it?

MR. WOODS: I want to get the relationship of these rooms here. That is all.

Q. Will you tell me whether the rooms you have shown in the basement correspond to these three rooms I have put little dots on? A. They do.

Q. THE COURT: Do you mean correspond or are intended to represent the same thing?

Q. MR. WOODS: Are they intended to represent the same thing? 30 A. I believe them to be the same rooms as shown on this plan.

Q. Where I have put the letters "M.S." those are the rooms your answer refers to and are intended to represent the same rooms as shown on the second sheet of this Exhibit 15? A. Yes, sir.

Q. Being the basement portion of your company's premises? A. Yes, sir.

Q. You got to that fire at what time? A. Approximately twenty minutes to ten.

Q. On the Sunday night? A. Yes, sir.

Q. And what did you do? What did you first see? A. Well when I 40 went down the crowd of people were gathered around the front and I joined the crowd watching the proceedings. Then after that I went to the door of our own premises and opened the door but a fireman standing

nearby told me there was no need to get alarmed for the time being and he would just as soon I did not open the door.

Q. And did you go in then? A. No, not at that particular moment.

Q. And what next did you do? A. I joined the crowd again to watch the proceedings.

Q. Can you give us any more definite idea how long it was before you went back to your own place? A. I would estimate about twenty minutes or half an hour. I do not think it would be more than half an hour.

10 Q. And then what did you do? A. I was thinking about some records we should get out of the place and I and two other chaps went in and got the records and came out.

Q. And where were those records? A. Some of them were in the space on the plan marked "general office" and others were behind the counter in the display room.

Q. And did you go then into the general office and behind the counter in the display room and collect these records? A. I went behind the counter. The other two men went in the office.

20 Q. Were you the first people from your company that had gone into your place? A. I believe so.

Q. And when you were in there what was the condition of things at that time? Was it smoke or flame or fire or as to any indications of fire underneath, if any? A. Underneath.

Q. Yes, underneath, from where to where? A. I could not say that. There was a good deal of smoke on the ground floor of our premises.

Q. Was there any fire at that time? A. I could not see any.

Q. Did you get any indication of there being any conflagration underneath where you were standing? A. There was no evidence of that to me—no.

30 Q. And were there firemen working around your premises then? A. No.

Q. And had the fire reached your premises by that time? A. I don't think so.

MR. SMITH: I do submit that question should not be asked in the form in which it was.

MR. WOODS: Perhaps you could put it in a better form.

40 THE COURT: I think you could, Mr. Woods. I think it is very leading. It is the first occasion I have had to say that in this case, fortunately. You know I am not one who objects to leading questions ordinarily except for good cause.

MR. WOODS: When I speak of your premises I am speaking of the portion of the premises that you could see. Could you see any fire in your premises? A. I could not see any, no.

Q. There was smoke, you told me? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 23.

Colin
Douglas
MacKenzie
Examina-
tion.

continued.

Q. Did you look for any? A. For fire?

Q. Yes. A. No.

Q. How long did it take you to collect your records—about? A. Not very long. I would estimate a minute and a half or two minutes, something of that sort.

Q. And you got them together and went out the front door? A. Yes, sir.

Q. Did you go back in again at any time? A. Well we had taken out the records we were particularly concerned in at that time and although the smoke was rather bad we were still more or less of the opinion that the fire was not serious as far as our premises were concerned and we did not go back in again immediately because I don't know whether it was the same fireman or not, but someone standing near there said we should not be opening the door. So I told him we would not open it any more. 10

Q. And did you go back later and get into the place? A. Yes. Another period of time passed by, probably half an hour or something of that sort, and I thought by that time the fire was going to become rather general and there were several personal records and personal effects of my own and I wanted to get them out and I thought I would go back again and get those out. 20

Q. And did you? A. No.

Q. Did you try to? A. Tried to. I opened the door but the smoke was so thick you could not possibly get in.

Q. Were the firemen there then? A. Not in the front end of the building, no. You are referring to our premises of course?

Q. I am referring to your premises. That is what you are interested in? A. Yes.

Q. And how long did you stay, about? A. About one o'clock.

Q. In the capacity of spectator? A. Yes, sir.

Q. When you were in the premises, as you have told us, in your own premises, did you notice any special smell at all of any kind? A. Unfortunately I have not a very good sense of smell. 30

Q. So that whether for that reason or for any other reason you did not notice any? A. No.

MR. SMITH: If Your Lordship pleases. I am just advised that aside from the evidence Mr. Mackenzie has given here there is something else on which I should cross-examine him on which I have not been instructed. I have just learned it this minute and if I could have an adjournment of ten minutes?

THE COURT: I think we are getting along sufficiently expeditiously that I can grant you your request. 40

At 2:40 Court Adjourns.

At 3:00 p.m. Court Resumes.

CROSS-EXAMINATION BY MR. MILNER.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence.

No. 23.

Colin
Douglas
MacKenzie
Cross-Ex-
amination

Q. You will remember you were examined for discovery as an officer of the Motor Car Supply Company? A. Yes.

Q. And I want to go over one or two questions that were asked at that time. According to my memory when you went into the building you found a very dense smoke there? A. Yes.

Q. In fact the smoke was so dense that you were almost overcome by it and you naturally got out again as quickly as you could. That is right? A. Yes.

10 Q. The premises and the stock room of the Motor Car Supply Company were in the Corona Hotel building? A. Yes.

Q. Part of that building. You occupied the east side of the Corona Hotel building? A. Yes.

Q. And over and above your premises were some of the rooms of the hotel? A. Over a portion.

Q. Over your premises there were a certain number of the rooms of the hotel two floors above? A. Yes, sir.

20 Q. They occupied the next two floors. Now as you say, the premises you occupied were used not only as offices but also as your warehouse? A. Yes, sir.

Q. And you had a variety of stock there some of which was your own and some of which was on consignment among others—but the only one I am interested in was the Sherwin-Williams Company? A. That is correct.

Q. Your stock of goods consisted of goods just used in connection with motor cars, trucks and things like that? A. Yes, sir.

Q. And you had in addition to that, and perhaps it is the thing outside of that classification, you generally kept a gallon of gasoline there? A. For cleaning purposes, yes.

30 Q. And then you had such stuff as wiping rags. That would be cotton stuff? A. Yes.

Q. And that was in the basement? A. A portion of it was in the basement.

Q. And you had tires? A. Yes, sir.

Q. And a large number of tires of the Firestone Company? A. That is right.

Q. They were also in the basement? A. Yes, sir.

Q. And these tires were wrapped in paper? A. Yes.

40 Q. You had certain quantities of combustible material on the premises, stock that is combustible? A. Under certain circumstances, yes.

Q. I asked you, or you were asked on your discovery for instance at Question 262:

"262 Q. Now, Mr. Mackenzie, outside of the things that you have mentioned, did you have anything on your premises that was inflammable or combustible?" And you said: "Well, yes, there would be a few

items that might be termed combustible under certain circumstances." That would be correct? A. Yes, sir.

"263 Q. What, for instance? A. We had a few gallons of vulcanizing cement. The inventory, of course, will show how much of that we had.

"264 Q. Where would that be? A. That would probably be in the basement.

"265 Q. In which room in the basement, do you know? A. It would be in the coolest part of the basement, which I imagine would be the northeast portion. 10

"266 Q. Who was that made by? A. Firestone. We would also probably have Shellac, which I imagine could be termed inflammable because it has an alcohol content.

"267 Q. Who was that supplied by? A. The Northwestern Chemical Company."

And I think you gave my friend Mr. Martland a list of the goods you held on consignment from the Sherwin-Williams together with a list of the sales of that stock. Would that be correct? A. Yes, that would be correct.

Q. I am putting in this, which was produced to me by Mr. Mackenzie 20 of goods on consignment from the Sherwin-Williams Company and also a statement showing the sales out of that stock prior to the fire.

Statement of Motor Car Supply Company showing stock held on consignment and sales, marked Exhibit 16.

Q. The Sunday of the fire one of your men was in the building? A. Yes, sir.

Q. Who was he? A. Mr. S. J. Davidson.

Q. At what time was he there? A. Approximately at noon.

Q. What is steel coat close black? A. One of the Opex materials used in re-painting cars. 30

Q. That would be inflammable? A. Yes, if opened.

Q. And all those steel coat things would be, regardless of the color? The difference is only in the color? A. Yes, sir.

Q. THE COURT: What do you mean by inflammable?

Q. MR. MILNER: What do you mean by inflammable? A. If it came in contact with an open flame.

Q. It will ignite? A. If the contents of the can were open and came in contact with an open flame, yes.

Q. In other words, they burn readily? A. Yes I suppose so, under the right circumstances. 40

Q. Well nothing will burn except under the right circumstances? A. Yes, sir.

Q. If they were properly mixed and produced a blue flame they would be burning? A. Certainly.

Q. Mr. Hollingsworth, he is from the Sherwin-Williams Company. You know him? A. Yes.

Q. He was examined for discovery and he was also asked about the chemical analysis of the paints that you have in store there and he dealt particularly with Opex colors and he said—he was asked this question: “Will you tell us what the chemical analysis of the paints are? A. Which one do you want? Q. Take Opex colours? A. These are all varied materials, talking in very general terms, and giving you a general analysis which would cover them, the lacquer mentioned there, the opex colours are pyroxylin and solvents.”

MR. WOODS: May I take the same objection as was taken by Mr. Buchanan in Montreal, that the witness should not be asked to produce the chemical analysis of his material. That objection was taken and the answer was taken subject to that objection and I am raising the same objection now.”

THE COURT: Where is that?

MR. MILNER: At the bottom of page 8 and page 9.

20 THE COURT: Where did you start to read?

MR. MILNER: “Will you tell us what the chemical analysis is?” And then the answer he gives on page 9.

MR. WOODS: Your Lordship will see that was objected to just a few questions before and I am taking the same objection on behalf of Sherwin-Williams Company whom I represent here.

THE COURT: I suppose I will have to read it to see whether it is admissible.

MR. WOODS: The objection was made against producing the analysis, I suppose because of being a trade secret.

30 THE COURT: There will be no more harm done now than may have been done if I admit it subject to objection.

MR. MILNER: Do you agree with what I have just read you from the examination of Mr. Hollingsworth? A. I am not an expert. I would be compelled to take his word for it.

Q. You would take his word for it? A. Yes.

THE COURT: Did you read the answer?

MR. MILNER: Yes, the first answer on the top of page 9.

Q. And Mr. Hollingsworth was asked this question on page 14: “So that the bulk of the two Opex colors is made up of inflammable substances more or less inflammable?” And he answered: “Yes.”

40 Q. Do you agree with that? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 23.

Colin
Douglas
MacKenzie
Cross-Ex-
amination
continued.

MR. WOODS: Will your Lordship read in connection with that answer the next question by Mr. Buchanan and the witness's answer?

MR. MILNER: I will read that in. "Q. But that would only become inflammable by fire being applied to them? A. Not necessarily at ordinary temperatures, but only under certain conditions, as I have pointed out."

Q. And then on page 15 he was asked this: "I agree that 'inflammable' is a relative term, but will you give me an idea? A. Several of them will take fire at an ordinary room temperature. Q. Sixty-five degrees? A. Yes."

10

MR. WOODS: Did you read "using the term 'inflammable' is loose?"

THE COURT: Of course the only use you can make of this is by getting the witness to say something in regard to them.

MR. MILNER: Absolutely. So far he has agreed.

THE COURT: Well what is your question?

MR. MILNER: I asked him this, I was reading this question to him from Mr. Hollingsworth's examination, and I will repeat it. He was asked this question: "I agree that 'inflammable' is a relative term but will you give me an idea?" "Several of them will take fire at an ordinary room temperature." And the next question is: "Sixty-five degrees?" And he answered "Yes." And the next question below that: "They are inflammable at an ordinary room temperature say about sixty-five?" Do you agree with that? A. Well I cannot agree with that, no, because I don't know.

20

Q. Are you prepared to accept Mr. Hollingsworth's statement?

MR. WOODS: I think if my friend is going to ask the witness that question I would ask that Mr. Hollingsworth's whole statement be read to the witness because you will see on pages 18 and 19 Mr. Hollingsworth is asked that same thing and explains what his language means. If he is to be asked if he agrees with Mr. Hollingsworth then he ought to get all Mr. Hollingsworth says on that occasion.

30

THE COURT: There may be a time when you will be able to use this examination for discovery but that time has not arrived. If this witness makes the answers he has already made to the questions you want me to refer the witness to I suppose it does not advance you very much if at all.

MR. MILNER: If there are any questions in Mr. Hollingsworth's examination which qualify what I have now read Mr. Woods will perhaps refer me to them.

40

THE COURT: The point I am making is that the only use you can make in cross-examination now on this examination of Mr. Hollings-

worth for discovery seems to become ineffective by reason of the witness's answer?

MR. MILNER: Yes I cannot pursue it further than that. I quite agree if the witness says he does not know and does not want to accept that as a correct statement I cannot go any further. I quite realize that.

Q. And this is the inventory of your business completed on January 31st, 1932. I am not going to read it all. A. That is it.

Q. And this is substantially the stock of goods you had in hand at the date of the fire? A. Less the sales we have made in the meantime.

10 Q. But the character of the stock in trade and this in hand would be substantially the same? A. Substantially the same.

Inventory, January 31st, 1932, Motor Car Supply Company, marked Exhibit 17.

MR. WOODS: I would like in view of the fact that these questions and answers have been referred to the Court and while I understand the Court's view of the witness's answer—to refer and read to the witness in the same way, whether he knows or not, certain answers on pages 18 and 19 of his general manager's examination—

MR. MILNER: I submit my friend cannot do that.

20 THE COURT: If the answer had been of any value I suppose you should not be permitted to get it without directing the witness's attention to the whole of the answer which you are asking him to agree or disagree with. So that I think in fairness at least Mr. Woods should be allowed to do exactly what he is now doing.

MR. MILNER: If the witness had said "I don't know" I would agree but the witness has said "I don't know, therefore I cannot answer."

THE COURT: And therefore you suggest Mr. Woods must trust me or any other Court that may deal with this matter in order to give effect to any parts you have brought out?

30 MR. MILNER: The witness already definitely answered certain questions.

THE COURT: If you expect me to give any effect to any part of Mr. Hollingsworth's examination to have any probative effect on my mind I think Mr. Woods must be allowed to do what he now proposes to do.

MR. MILNER: Yes, but one answer was made of his own knowledge.

40 THE COURT: I think Mr. Woods may now take it that as far as I am concerned at least I am going to take those parts that you have read from Mr. Hollingsworth's examination as to which the witness has

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence.

No. 23.

Colin
Douglas
MacKenzie
Cross-Ex-
amination
continued.

made the answer that he cannot agree because he does not know—they will be entirely disregarded as having any probative effect. In fact I will forget them.

MR. WOODS: I will just read this at page 18: "I would like you to define what you mean by inflammable." "What I mean is it will catch fire at an open flame. It is not spontaneously inflammable."

THE COURT: That is what the witness already said and—

MR. WOODS (reading): "Is it spontaneously inflammable under any condition? A. No, not to my knowledge. Q. Is there any other way of igniting it other than bringing it into contact with an open flame? A. Not to my knowledge. And that is when it is in an open vessel. What we are discussing just now are in closed containers." And so far as your knowledge of all the material in the Motor Car Supply Company it was in closed containers as you have told us? A. Yes, I have already given evidence to that effect. 10

MR. MILNER: Well I think the other parts should be read by Your Lordship too.

THE COURT: Notwithstanding my statement that I will disregard it and that you have no right at the present stage to use it as an examination for discovery. 20

MR. MILNER: Very well.

MR. WOODS: My friend brought out on his cross-examination that you have Firestone tires there? A. Yes.

Q. And they are enclosed in paper. And the Motor Car Supply Company are the agents for the Firestone Tires? A. Yes, sir.

Q. They are in the basement? A. Yes.

Q. Now when the fire was all over I suppose there was a certain amount of salvage? A. Yes.

Q. And a considerable number of these tires were salvaged? A. Not by us, but they were salvaged. 30

Q. Did you see that salvaged material? A. Yes.

Q. Did you see those tires? A. Yes, sir.

Q. Now what would you say as to whether the paper was on them or many of them or not? A. The paper was on many of the tires, yes.

Q. Not burned off? A. No.

Q. And one question I should have asked on examination-in-chief, it did not arise out of what my friend said—with your Lordship's permission. You pointed out to me an east basement stairway? A. Yes.

Q. Was that an open stairway? A. Yes, sir.

Q. And one more question I should have asked. Was there any heating in your basement? A. No. The heating was all supplied by the hotel. 40

No. 24**Evidence of Alexander Annon Mackenzie.**

ALEXANDER ANNON MACKENZIE, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. You are a brother of the previous witness? A. Yes.

Q. And you are one of the employees of the Motor Car Supply Company here? A. Yes.

Q. And were on the 21st February 1932? A. Yes.

10 Q. And you are one of the men who went with your brother into the office of the Motor Car Supply, as he has told us, to salvage or get some records you thought were important? A. Yes.

Q. And you went in with him? A. Yes.

Q. And the other who was with you is who? A. Mr. Atherton.

Q. And he is not in Edmonton. He is one of your Calgary salesmen? A. I believe he is in Lethbridge now.

Q. And tell us your experience just as to what the condition of affairs was when you went in? What did the place look like as to much smoke or no smoke, as whether there was fire or no fire, or whether
20 you noticed any? A. No fire and could see practically nothing. The smoke was quite heavy.

Q. And there is nothing wrong with your sense of smell? A. No, sir.

Q. I believe Mr. Colin's sense of smell was affected at the war. During the time you were in there collecting these records did you notice any special smell at all? A. No, nothing other than just smoke.

Q. And your sense of smell is good? A. My sense of smell is correct.

CROSS-EXAMINATION BY MR. SMITH.

30 Q. Is it good enough to tell what kind of smoke it was? A. I am afraid there—I am not an expert.

Q. And in other words you smelled smoke but you could not tell where it came from? A. No, sir.

Q. And you did not see any blue flames, did you? A. No.

No. 25.**Evidence of Ranald D. White.**

RANALD D. WHITE, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 24.
Alexander
Annon
MacKenzie
Examina-
tion.

Cross-Ex-
amination

No. 25.
Ranald D.
White.
Examina-
tion.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 25.

Ranald D.
White.
Examina-
tion.

continued.

Q. You are a lawyer practising in Edmonton? A. I am.

Q. And you are not an expert witness in respect of either smells or welding or laying of gas pipe, and I am not calling you as an expert. But you did see this Corona fire? A. Yes, I went down when the fire was raging.

Q. Could you give us any idea about what time you went there? A. Well I cannot tell you the time, but I was there when the manhole blew up just at the west of the building there. If you could tell me what time that was. I was there about half an hour each way from that.

Q. But before it blew up were you there? A. Yes, about half an hour or perhaps three quarters. 10

Q. And did you walk along the lane at the back of the Corona Hotel towards 107th Street, in your memory, before that manhole blew up? A. Yes, I walked along that lane. It was just south of the Corona Hotel in the Motor Car Supply Building.

Q. And will you tell us what occurred while you were walking along? A. Well the thing I most remember I think was a blue flame burning up in various places alongside the south wall of the building in the lane. I noticed a blue flame very much like a gas flame. I thought it was a gas flame. I noticed it in several places in the lane. 20

Q. Between the wall of the building— A. Just beside the wall of the building, the south wall of the building on the outside.

Q. Where the building joined the pavement? A. Yes, just in there.

Q. And then you went along to 107th Street. It was pretty wet along that pavement that night? A. Well hoses were playing there. It was not a very comfortable place to be.

Q. And when you got to 107th Street how long had you been there when the manhole top blew off? A. I had been up that lane possibly ten minutes before the manhole went up, just before, I cannot tell you the exact time. 30

Q. You were near the manhole when it did go up? A. Quite close to it, rather dangerously close.

Cross-Ex-
amination

CROSS-EXAMINATION BY MR. SMITH.

Q. You are quite sure you are not an expert on blue flames? A. I am not.

Q. You gave it as your opinion it was a gas flame and you were not asked to but you did say that? A. Yes I did.

Q. And you are solicitor for the Motor Car Supply Company? A. Yes.

Q. And have been from the beginning? A. Yes. 40

Q. And it is sought to show that the Motor Car Supply Company along with others were burned up by gases let loose by the defendant company? A. That is so.

No. 26.**Evidence of Robert Templeman.***In the
Supreme
Court of
Alberta*Plaintiffs'
Evidence.

No. 26.

Robert
Templeman
Examina-
tion.

ROBERT TEMPLEMAN, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. You are one of the Templeman Brothers who have been in the city a good many years. Are you the older? A. No, the third.

Q. And you are a plumber? A. Yes.

Q. And gas fitter and steam fitter? A. Yes.

10 Q. And your place of business is on 107th Street just at the corner of 107th Street and this lane behind the Corona Hotel? That is right? A. Yes.

Q. Now where were you on the night of the fire, when the fire started? A. I was visiting a friend on the south side.

Q. And you received a telephone message? A. Yes.

Q. About the fire? A. Yes, I got a phone from my brother saying that the Corona Hotel was on fire and get over there right away.

Q. Do you do any work for the Corona Hotel? A. Yes, sir.

Q. You are the plumbers? A. Yes.

20 Q. Whenever they need any plumbing done? A. Yes.

Q. And you came over, did you? A. Yes.

Q. And what time did you get there? A. Approximately half past nine.

Q. And what did you do? A. I met my brother and Mr. Philpots in the lane.

Q. Mr. Philpots is an employee of the gas company? A. Yes, the gas company's man.

Q. This plan has the various points marked where you met your brother and the other points that will become clear as you go on. Where
30 did you meet Philpots and your brother?

MR. SMITH: I have not had an opportunity of seeing this.

Plan of lane and lots adjoining Corona Hotel showing smoke test holes, marked Exhibit 18.

Q. Tell me where you met Philpots and your brother. I have it marked here. A. Just west of the coal chute at the back door. There is a door there approximately to the west side of the coal chute. That is the back entrance to the basement. That "F" indicates it. "Gas shut-off."

Q. That is where you saw them? A. Yes.

40 Q. And what had they been doing so far as you could learn from Philpots or your brother in his hearing? A. They were at the gas shut-off there. They were working there.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 26.
Robert
Templeman
Examina-
tion.
continued.

Q. Doing what? A. I don't know.

Q. Did Philpots say? A. No, he did not say.

Q. Did Philpots speak to you? A. Yes.

Q. What did he say to you? A. He said: "Do you know where the shut-off is?"

Q. What did Philpots say to you? A. Philpots asked me if I knew where the gas meter was inside the building.

Q. And what did you say? A. I said yes.

Q. And what did you do? A. He said: "I would like to shut off the gas at the meter." 10

Q. And what happened? A. And I said: "Come on then, we will go down and shut her off, I know just exactly where it is."

Q. And did you go? A. Yes.

Q. You and he together? A. Philpots and I.

Q. Did he have a flashlight? A. Yes, a flashlight.

Q. You went first and he went next, did you? And who shut the gas off—Philpots or you? A. I shut the gas off at the meter with Philpots' wrench.

Q. And that would be about what time? A. Well between half past nine and ten o'clock. 20

Q. The gas at the meter was shut off by you with Philpots' wrench. And how long did you stay around that fire? A. Oh maybe till one or two o'clock in the morning.

Q. And did you know of the blowing off of the manhole top on 107th Street—the manhole cover? A. Yes.

Q. And what time would you estimate that manhole cover on 107th Street near the corner of the lane blew off? A. I am sure I could not tell you just what time it would be.

Q. Can you give us some approximation of the lapsed time. How long did it appear up to the time that the manhole cover blew off? Just give us the best estimate you can give us. Was it five minutes, ten minutes, half an hour or an hour? Give us as good an impression as you can? A. I think it was just after eleven o'clock. I am not sure on that point. 30

Q. Now then you were there the next morning in that neighborhood, were you? A. Yes.

Q. By about what time in the morning? A. Eight or nine o'clock.

Q. And what did you notice then in the lane that you had not seen the night before? A. I saw a four-inch galvanized pipe.

Q. That was standing about where? A. Off that hole. 40

Q. Off the hole marked "A" on the plan Exhibit 18. That is "A" in the lane and was as marked on it "vent pipe" in pencil? And there is a legend on it "hole dug by gas company." Was it dug by the gas company? A. I think so. It was dug over night. It was started before I left.

Q. And that four-inch galvanized pipe was sticking out of the ground about how high? A. It would be approximately ten or twelve inches; I am not just sure.

Q. And was there anything escaping from it? A. I suppose so.

Q. Well could you tell? A. I could see something coming out of the top of it like a heat wave coming from it.

Q. Now had you noticed whether there were any other holes dug during the night along this lane? A. I don't think so. I don't remember.

Q. You don't remember? A. No.

10 Q. At all events, you did see some hole dug during that day that you know was dug by the gas company during the Monday following? A. Well you were talking about the lane?

Q. Yes, I was; but now I am talking about 107th Street. A. Yes, I figured the gas company was doing some digging. I do not just exactly remember where they were digging.

Q. Now then you did on Tuesday I believe in company with the city sewer inspector or foreman Mr. William Ruff—what is he? A. He is foreman in the City Sewers Department.

Q. Did you conduct any smoke tests for the City? A. Yes.

20 Q. You assisted him in doing it or he assisted you in doing it? A. Yes.

Q. And just describe what you did on the Tuesday with regard to putting smoke into any aperture along there and what the result was as carefully as you can? A. There was a hole at that time dug there.

Q. Dug at the point "A". That is the one you have already said. A. There was a hole there.

Q. Go ahead from there? A. This hole was here, numbered "A". That is where the company had the pipe there. At that time this vent pipe was removed.

30 Q. That is on the Tuesday? A. On the Tuesday.

Q. Who removed it? A. I don't know.

Q. Had it been removed? Was it away? A. It was gone.

Q. And what did the City do in the way of digging holes? A. I think the City dug this hole here.

Q. Could you remember that? A. I would not be just sure. The hole was dug.

Q. You did not dig it but the gas company dug it or the City? A. Well somebody dug it.

40 Q. Well there was a hole dug there? A. There were lots of diggers in the neighborhood. I do not know who they were working for.

Q. And then you have got "D" at this hole and you have a hole at "F" where your brother and Philpots had been working? A. Yes.

Q. And there are these three holes, at all events. Now what did you do? A. I put the smoke machine underneath just where the connection of this vent pipe was put. It was on a wooden box.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 26.
Robert
Templeman
Examina-
tion.
continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 26.

Robert
Templeman
Examina-
tion.

continued.

Q. How big was the wooden box? A. Approximately I suppose 8x4—eight inches wide and four or three inches deep.

Q. I think we have the exact dimensions of it. It is certainly marked on the plan Exhibit 1 on the discovery of Mr. Garrett. But it is that wooden box that carries the City's return circuits. A. Yes, there was a box in there and that box was plugged by cotton waste alongside the cables.

Q. How many cables were there? A. I could not just tell you but there was more than one.

Q. And can you tell us—there was cotton waste put in around the 10 cable? A. Between the cable and the box.

Q. And did you take it out? A. Yes.

Q. Was there very much cotton waste? A. Well a couple of handfuls.

Q. And you put your smoke machine down there? A. Yes. On the end of the smoke machine is an inch and a half rubber pipe. I took the packing out of the east side of the box and pushed the nozzle of the machine in there, choked her up with clay and put the smoke on the machine.

Q. Just let us get clear what that smoke testing machine is. It is 20 made of an apparatus at all events to make smoke? A. Yes.

Q. That is to say the top part looking down would be something that would make smoke. How would you make smoke? A. There are two chambers. One contains a bellows and the other container, there is a pipe between the two, and you put the oakum or anything that contains smoke into the chamber and light it and you pump the bellows which creates a draft and that creates smoke which passes into whatever you are testing.

Q. And it was the tube you inserted— A. The tube from the 30 smoke machine.

Q. You inserted into this box conduit? A. Yes.

Q. And you did that at point "A"? A. Yes.

Q. Now where was this smoke forced to? A. Forced to the next hole.

Q. That is at point "D"? A. At point "D".

THE COURT: From where?

MR. WOODS: From the point "A."

MR. SMITH: You are sure you have got the right day this was done?

MR. WOODS: It was on a Tuesday? A. I am not just sure of the 40 date. I could tell if I see my time sheets. It might be Wednesday.

Q. It went in at "A" and it came out— A. It came out at "D".

Q. It had been put into this box conduit? A. Yes.

Q. And came out at that point "D." And then what did you do with your smoke machine? A. Lifted the smoke machine from "A" and put it in the box at "D" in the same way as I had there.

Q. But you did not find any packing at the point "D"? A. No. I think I cut the box there myself, I cut a hole in the box to get the insertion in. The hole was dug.

Q. And then where did the smoke come out? A. We put the pipe in at "D" and it came out at the next hole which would be "F". That is where the "CC" is for the gas company.

10 Q. The curb box? A. Yes.

Q. And the smoke came out at "F"? A. Yes.

Q. When you say the smoke came out, did it observedly come out? Could you see it? A. Oh yes, we could see it rising out of the hole.

Q. And did it escape at any other point than that? A. Yes, it did.

Q. Whereabouts? A. It went right into the basement of the Corona Hotel.

Q. MR. MILNER: Well now. A. Well I saw it, Mr. Milner. My eyes do not deceive me.

20 Q. MR. WOODS: There is a "G" marked here. Did you see it come up there? A. It was around in that vicinity.

Q. In the vicinity of "G" as well as in the vicinity of "F"? A. Yes.

Q. "G" is where the coal chute is. After you put your smoke testing machine down at "D" it came out at "F" and at the coal chute at a point— A. At a point in that vicinity. There was a hole in the wall there and it came in through that hole.

Q. And that is when you say you saw it go into the basement of the Corona Hotel? A. Absolutely.

30 Q. And then there is a point marked "E" where the City dug a hole. Did you see any come out there? A. I cannot remember. It is a long time ago.

Q. Now I am on another subject now.

THE COURT: Is it to be left to inference as to what the value of the smoke test is?

MR. WOODS: No.

THE COURT: Or rather as to what it demonstrates?

MR. WOODS: The object, I may tell you, is to demonstrate that gas will go where smoke goes and this smoke having gone that way that gas passing along that conduit would go through that box and go where smoke went?

40 THE COURT: But I imagine the implication that was desired?

MR. WOODS: The evidence that gas will go where smoke goes—I am so particular about this matter—I can show it from one of the

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence.

No. 26.

Robert
Templeman
Examina-
tion.

continued.

experts but if your Lordship will allow me to ask this witness whether he knows about it without qualifying him as an expert—if my friends won't object—

THE COURT: For my purposes you have answered my question quite effectively just as you might in opening a case. That is all. And it is intended to give some evidence that will enlighten me on that?

MR. WOODS: Yes that will enlighten you on that.

Q. Your firm was engaged and you participated in the clearing away of the debris from the basement of the Corona Hotel building after the fire? A. Cleaning up the lane and the front of the building. 10

Q. You were engaged in that work with others? A. Yes.

Q. And were you, did you clear away the debris around the garbage burner? A. Yes.

Q. And in what condition did you find the door of the garbage burner? A. The door of the garbage burner was closed.

Q. And were you present when the door of the garbage burner was opened? A. Yes.

Q. At that time. Did somebody open it right there? A. I cannot remember it being opened but I remember seeing the inside of it but I do not just remember of it being opened but I was around there at the time, 20 working.

Q. It was the same day the debris was cleared away from that point? A. Well we cleared it for that purpose I think.

Q. And you looked inside the garbage burner?

THE COURT: Why? A. For the purpose of seeing whether the door of the garbage heater was open or shut.

Q. What day was this—the same day you made the smoke test? A. No I think it was a day later, but I would not be sure.

Q. MR. WOODS: And what did you see when you looked into the garbage burner? Just describe? A. Well the garbage burner was just 30 as if the fire had burned quietly down and left the ashes.

Q. Were those ashes disturbed? A. Oh no.

Q. Was there anything in the appearance of the garbage burner when opened or from what you saw inside of it to indicate that the garbage burner had been opened? A. No, the ashes was quite level.

Q. Had any fallen matter or any substance from the fire fallen into it? A. No, the door was closed.

CROSS-EXAMINATION BY MR. SMITH.

Q. You said the ashes in the garbage burner were not disturbed. By that I suppose you mean the ashes or whatever was in the machine 40 had burned up in the usual way, do you? A. I mean that it seemed

that the fire had just burned down and the ashes were lying undisturbed as if nobody had touched them in any shape or form.

Q. And I take it that nobody had been monkeying with it and nothing had been torn from the outside? A. Yes, there was no fire debris. It was just like burnt wood.

Q. Now coming back to your—

MR. WOODS: I am showing you, with my friend's consent, I am showing you a picture of that garbage burner as it was exposed and before the debris was removed from the immediate neighborhood of it, taken about that time. Could you say whether that is the appearance it presented? A. Absolutely. That is just as I saw it.

MR. SMITH: May I see it? (Mr. Woods hands photograph to defendant's counsel.)

Photograph of garbage burner, marked Exhibit 19.

Q. MR. SMITH: We have just been shown Exhibit 19. And this red arrow points to this garbage burner. You will observe the red arrow? A. Yes.

Q. It looks as if quite a lot of things might have happened around there? A. Yes the debris has been cleaned away from that, you will understand.

THE COURT: I thought Mr. Woods said this picture was taken before the debris had been removed.

MR. WOODS: Well there must have been some debris removed. The whole of the debris had not been removed. There is a whole lot of it around there.

MR. MILNER: The whole thing was completely covered and they had to dig away before they got there.

MR. WOODS: I think my question was sort of half right then.

MR. SMITH: Before this photograph was taken that garbage burner had been completely covered and you had to remove debris to get it in that position? A. She was not completely covered.

Q. Well nearly so? A. Yes, about level (indicating).

Q. Well just show His Lordship? A. There is a twelve-inch iron pipe and coming off the top of that a smoke pipe heavily supported and the debris is lying on the top of that. There is a certain portion of rubbish taken away and thrown to the side to ascertain the position of that door.

Q. The cast iron pipe is open? A. Oh you can see it in the photograph. It is open there now.

Q. All I had in my mind, Mr. Templeman, was that with the debris which I still see there and with the debris which was taken away there

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 26.
Robert
Templeman
Cross-Ex-
amination
continued.

was no doubt a very considerable heat around that burner during the fire?
A. I would imagine so, yes.

Q. There would not be any doubt about it? A. There would be heat there. I do not suppose it was cold.

Q. And I suppose a number of things fell from the floor above which is very apparent from looking at this photograph? A. Yes.

Q. And I suppose it is plainly apparent to you that when you found pieces of bedsteads, radiators, iron pipe, spring mattresses and this sort of thing falling from above they might very easily have closed the door of that burner, that is, had it been open before? A. It might have done. 10

Q. That is all. Do you want to add something to that. For example, the bar which is again—

MR. WOODS: Well you asked him if he wanted to add something.

MR. SMITH: I did and I waited. Now do you want to ask something, and you see a bar against the front of the door. A. I figured that bar had been placed there by the firemen to hold the door closed.

Q. Oh. This is news. You thought that a bar had been placed in front of the door to hold that door closed? A. That is what it looked like to me.

Q. Now you and your brother were the persons who did the plumbing, heating and steam fitting work in the hotel? A. I installed the garbage burner. 20

Q. You are quite familiar with the machine? A. Yes.

Q. Now I want to talk to you about this smoke test, and I wonder if you are not perhaps just a little mistaken. Do not misunderstand me. But I want to make sure your memory is right as to what next happened. You say you went in with your smoke machine at this point in the lane which is marked "A"? A. Yes.

Q. And the smoke came out at the point which is marked "D"?
A. Yes. 30

Q. In other words, the next hole which had been opened in an easterly direction in that pipe? A. Yes.

Q. Now that hole at point "D" I take it, was a hole which had also been opened down to this wooden conduit box? A. Absolutely.

Q. And there is nothing strange that anything you put in at "A" should come out at the point "D". That is what you would logically expect? A. I beg your pardon. I do not get you.

Q. You would expect if you put smoke into the conduit box at "A" it would come out at "D" because there was an opening down to the conduit box? A. We were pushing the smoke to the left and it rose to the hole. 40

Q. You would expect that? A. Well I did not expect nothing. I was simply doing what I was told, to see if the smoke would pass through the box.

Q. Granted it were open so the smoke could pass through you would expect it to rise at the point "D" if it were not obstructed? Now didn't you conduct a smoke test from the east this day you were there— from the eastern hole? A. We worked from the west end east.

Q. And then didn't you try another test from the most easterly hole, that is the one over— A. I do not just remember. I could not be sure of that although possibly I did. It is a long time ago and I cannot just remember.

10 Q. Yes, I know you are doing your best and do not misunderstand me. I also want to know this, on the occasion when you saw smoke go into the hotel premises, as you told Mr. Milner so plainly a moment ago it went in through that chute? A. I said approximately to east and around that vicinity there. There was a hole in the wall.

Q. It went through a hole in the wall of the hotel. A. Yes.

Q. And I want to know if at the time the smoke came out of the box and went through the wall in the hotel you had not plugged the box at both ends. Just think that over. A. No.

20 Q. By no, do you mean you did not do so. A. I mean that we worked from the west to the east. I may have, after proving the smoke going into the basement of the hotel, I may have went to this end and worked it that way but I did not plug the box at the wall.

Q. I did not mean it at the wall. What I am trying to say is this, did you in doing your smoke test at any time have a cut-off in your conduit box? I am not suggesting the wall. I am just asking you if in the conduit box when you applied your smoke you did not have the box plugged so that we would have all the space in the box where there would be a cut-off at each end? A. No.

30 Q. Well now we have heard something about cotton waste which you found at the point "A". I take it there is nothing wrong with that, that is where the vent pipe was. A. Yes.

Q. And the object of the waste was to see— A. No, I think the waste was put there to keep any dirt from going into the box.

Q. Oh I thought it might have been of some assistance in getting the gas out from the conduit box? A. Well it may have been.

Q. Is there anything wrong with that waste being in that box? A. No. They had to put something in and waste was the most suitable thing I suppose to hand.

40 Q. Well was there anything wrong with it? I am frightened. They are trying to make us pay a lot of money and I want to know if there is anything wrong in it if we did it.

MR. WOODS: We are not suggesting there is anything wrong in that.

MR. SMITH: Nothing turns on that. I think I will stay with that

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence.

No. 26.

Robert
Templeman
Cross-Ex-
amination
continued.

longer. What is the significance of the waste being in the box? What is your idea? A. It was packed in there for a purpose, I suppose, but I did not put it in.

Q. Now tell me the purpose. You are a smart man and you are going to help me? A. I won't guess. I want something definite.

Q. I want you to tell me what would be the possibilities of it. A. I have not given it the least consideration.

Q. So you as a practical man and a plumber—you were not concerned about this waste at all? A. I took waste out and I put it back in again when I was finished. 10

Q. Do you think it was a good thing to leave it there? A. Absolutely, to keep the dirt from going in beside the cable.

Q. So you think that whoever put the waste there put it there with a view to protecting the cable from the dirt? A. I said that before.

Q. There is no doubt that this box running along there was in a terrible condition? It was rotten? A. I did not find it rotten.

Q. How did you find it? A. I found it in fair condition. Rotten would mean if you touched the thing with a shovel it would give way. But where we cut the box it seemed the wood was fairly good.

Q. Did you have a look at it after the ground caved in at the back of the hotel? A. Oh I don't remember seeing it. 20

Q. Have you seen any photographs of it where the ground caved in at the back of the hotel? A. This is the first photograph I have seen.

Q. Now back again to this smoke business. I will tell you what I want you to do for me. I make this suggestion to you, but in this smoke test—and I am not saying there is anything wrong with it—that with waste or some other substance the conduit box was plugged, you put it in the one end where you put your smoke machine. Well then, down the line to the east was there not a further obstruction put in in order to have your smoke test work properly? A. No. 30

Q. Will you put your mind to that over night and see if you perhaps get a clearer view of it in the morning. You may be quite right and I am wrong. Will you think it over? A. Yes.

At 4:30 Court adjourns till 10:00 a.m. Thursday, January 18, 1934.

Thursday, January 18th, 1934, Court resumes at 10:00 a.m.

Q. When we adjourned yesterday I asked you to try and fix the day on which this smoke test was conducted. Have you been able to do it? A. The day was Friday the 26th.

Q. That is the day I suggested to you yesterday? A. That is the day I took off my time sheet. 40

Q. Now looking at Exhibit 18. I also asked you to search your memory and see if you could remember when this smoke test was con-

ducted, the conduit pipe was plugged off. What is your memory now about that? A. My memory is just the same. You referred to this last hole here, didn't you?

Q. Well put it at any of them. A. From the point where the vent pipe was here on the point "A" we tested to the next hole, the next point; that is the point "D". From that point to that point we plugged the busted end to prove the smoke would travel from that point to this point.

10 Q. And you had not yet reached the Corona Hotel? A. No. We tested from that point to there and proved there was an open passage in the box to point "D". Now on the east side of the hole on this we plugged so the smoke would not travel right through, that is going east. We plugged the east side of that hole. Then we proved it there. We lifted the machine from here, took the plug out of the east end and inserted the nozzle looking east to this hole. That is point "F".

Q. And is that point "F" where the gas company's box was? A. That is where the shut-off for the gas was. The very same thing happened again. We plugged the busted end to get the gas to travel to that point.

20 Q. The city workmen on that occasion enlarged that hole at the curb box to bring it back to the conduit box? A. That was quite a big hole.

Q. It did come back to the hole itself? A. Oh yes. I cannot just remember seeing it but there was quite a hole cut open there, maybe three feet in diameter and maybe more or less, and there was quite a hole there, maybe a much bigger hole.

Q. You got to "F" and you found smoke came out at that hole? A. Yes.

30 Q. And that showed the conduit box was open from point "A" to point "F" and through point "D"? A. Yes.

Q. And what next? A. Then we inserted the hose at point "F" and I smoked there. There was another hole at point "E" that is at the east end of the building.

Q. Practically at the property line at the east end of the building? A. Yes. But I did not plug that hole.

Q. Did anybody plug it? A. I do not say it was not plugged but I did not do it.

40 Q. Now I have in my hand a report given to me by the City Engineer only this morning covering these things and I am going to tell you what he has to say and see if this will assist your memory. He says: "Hole No. 1 opened by the gas company at their leak," that is back in the centre of the road. Then he says "Hole No. 2 immediately east of Hole No. 1; this hole was opened to see if there was any sign of settlement in the gas trench. No sign of settlement. The hole was put down in this bit to see the depth of frost. Hole No. 3 at east property line opened by gas company and used by us for a smoke test." A. Just read that.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 26.
Robert
Templeman
Cross-Ex-
amination
continued.

Q. "Hole No. 3 at east property line opened by gas company and used by us for smoke test." It seems to me that must be a mis-description. I think it was the city who put down that hole. A. The city dug that hole.

Q. I think it must be mis-named in this report.

MR. WOODS: I am calling the man who made this—Mr Ruff—and I have been in touch with the City Engineer with regard to it upon this very point since and I may say that Mr. Ruff is being called and if you are going to use that I would like you to put it in or wait until Mr. Ruff is called.

10

MR. SMITH: I am not going to put it in because it is clearly wrong and I was trying to straighten it out with the witness.

Q. Let me put it this way and see if I get your memory of the thing correct—that the only time you saw smoke emerging from this conduit box and enter the Corona Hotel was when you put your smoke in at point "F" and you were working east? A. We were still working east.

Q. And at that time you saw smoke come out of the hole on the east property line? A. No I did not see it. I said it came around a hole in the wall at a point near the coal chute.

Q. That is marked? A. It is "G" there. But it was around that 20 neighborhood of the coal chute. When I pumped into point "F," Ruff, the city foreman came to me. He said: "All right that is all we want to know, pull your machine." I said: "Is the smoke coming below?" and he said yes, and I saw it myself.

Q. You were at the smoke machine and Mr. Ruff was further down the lane from you? A. Well I was not working at that hole. I was working at the point "F".

Q. Now I want to go to something else. What pressure were you using on your smoke test? A. Now that I cannot tell—just what pressure you would have to get an expert to describe it. There is about 30 six or seven inches of water.

Q. In what area? A. Eight or nine inches in diameter.

Q. And did you have anything on top of that? A. My hand.

Q. Pressing on the lid? A. Holding the lid down.

Q. Perhaps you cannot in pounds or ounces—you would not care to estimate? A. Once you get the pressure to a certain thing the smoke will come through water so you cannot put an excessive pressure on the machine.

Q. But there is no gauge on it? A. No. I can't tell you.

Q. And you are unable to tell me the pressure which is used to put 40 that smoke on? A. Not unless I was testing the machine.

Q. You are calling Mr. Ruff and he can probably straighten it out much better than anybody else?

MR. WOODS: Yes, and I may tell you I asked him about that very thing and he says he does not know whether the hole was plugged or was not.

*In the
Supreme
Court of
Alberta*

MR. SMITH: As I understood you, you plugged this. You first went in at point "A"? A. Yes.

Plaintiffs'
Evidence.

Q. You plugged at point "D" and you saw the smoke come out at point "D" showing the conduit was open? A. Yes.

No. 26.
Robert
Templeman
Cross-Ex-
amination
continued.

Q. Did you see any smoke coming out in the lane or in the ground beside the lane at that time? A. No I did not, but they plugged that
10 end to test if the box was tight or not. We were testing from hole to hole after we proved the smoke was travelling from point to point. Ruff said: "Plug up that end to see if the box is tight" and I plugged the end.

MR. WOODS: Whereabouts? A. At every point we travelled we plugged the end and put the machine on to see if the machine would stand up and the machine would not stand up, proving that the box we were testing was not air tight.

Q. Was that plug taken out after you plugged the end? A. Yes. We cleaned the box out.

Q. MR. SMITH: You plugged that and then you put your next
20 plug in at what point, or did you put another plug in? A. Yes, we plugged every hole. We tested every section of the box to see if the box itself was air tight.

Q. And on the occasion that you put your machine in at point "F" and pumped smoke in an easterly direction was there a plug in at point "E"? A. I did not see a plug and I did not put a plug in.

Q. You said you plugged at every point to see if the box was air tight? A. I have talked about the points I tested. My machine was never at point "E".

Q. Your machine was never placed at the point at the pit on the east
30 side of the building. That is your memory? A. Yes, that is my memory.

RE-EXAMINATION BY MR. WOODS.

Re-Exam-
ination

Q. Looking at this photograph Exhibit 19. There appears to be something as shown in the photograph against the door. One end is against the garbage burner door? A. Yes.

Q. And my memory of your evidence to Mr. Smith was when you were looking at that photograph you said that you thought the fireman had put that against the door to keep it shut, something like that? A. It looked like that to me.

40 Q. Who do you mean? A. Well I meant Christie or Semple.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 26.

Robert
Templeman
Re-Exam-
ination
continued.

Q. The hotel fireman? A. The fireman who was firing the garbage burner.

Q. I think my friend thought you meant, and perhaps I am wrong—the city firemen? A. He thought I meant the Fire Department?

Q. Yes. A. Oh no, it looked to me that it was there for a purpose, to hold it shut.

Q. Well you don't know anything about that at all? A. No, I don't think so.

Q. You did not ask Christie or you don't know anything about it? A. Oh no. Christie was not around. Nobody was around. 10

Q. What were you burning in this smoke test to make the smoke? A. Oakum.

Q. And the smoke that would go into that conduit box would be open smoke? A. Yes.

Re-Cross-
Examina-
tion.

RE-CROSS-EXAMINATION BY MR. SMITH.

MR. SMITH: I am showing you a photograph. You are familiar with that basement. You observe the boilers there? A. No I cannot see the boilers there.

Q. Do you recognize that as the photograph of that place? A. Yes, absolutely. 20

Q. And the garbage burner would be somewhere in there? A. The garbage burner would be in that vicinity. It would be in the vicinity of the photograph there. I have an idea just where it is.

Q. The point you indicated in the photograph was a little to the left of the centre in here, I understand? A. Yes.

Q. And as a matter of fact you cannot find it in the photograph but it gives you an idea of the condition of affairs under which that garbage burner was found? A. Yes.

Photograph showing debris, marked Exhibit 20.

No. 27.

30

No 27.
Thomas
Templeman
Examina-
tion.

Evidence of Thomas Templeman.

THOMAS TEMPLEMAN, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. You are a member of the firm of Templeman & Templeman Brothers, plumbers, that the last witness spoke about? A. Yes.

Q. And what did you see of this fire? When did you first have any contact or knowledge of this fire on the night Sunday, the 21st February, 1932? A. I was sitting in my house when I heard the fire engine come around and I went out to see what the trouble was.

Q. What time was that? A. Just whenever the first fire rig came around. I could not tell you the exact time.

Q. You live at the back of the hotel? A. Yes, about fifty feet from the hotel.

10 Q. And who did you see when you went out? A. The first man was Mr. Ardern, manager of the Corona Hotel.

Q. And as a result of a request he made to you what did you do? A. I phoned the Gas Company at the Gas Company's office and got no reply. Then I phoned up Mr. Spencer of the Gas Company and told him the Corona Hotel was on fire and a man had been burned and he told me there was a man on the road over.

Q. And then what did you do? A. I went to work and got a pick and also my water key and went to work to dig up the city shut-off.

20 Q. The gas shut-off on the lane? A. Yes, that is the curb-box, yes.

Q. Go on with your narrative from there? A. After I had been working there for about five minutes Mr. Philpot showed up.

Q. He is the Gas Company man? A. Yes.

Q. As far as you know he is the first Gas Company man who was on the scene? A. Yes.

Q. And you had been working for about five minutes digging ice away in an endeavor to get at the shut-off valve in the lane? A. In the lane.

30 Q. That would shut off the gas? A. I am not allowed to touch the Gas Company's stuff on the lane but I was getting this ready. If he had not shown up I would have tried.

Q. Just go on from there and tell me what happened in connection with shutting off that service cock? A. Well Philpot came around and he said I was digging at the wrong place. So we started a little further out and when we did go to work and find the curb-box we found the top of the curb-box was frozen.

Q. How long did it take you to find the top of the curb-box, do you think? A. I should think somewhere about another five minutes.

40 Q. Go on. A. And then I went to my house and got some hot water. We poured it on the top of the cover and got the curb-box open and we shut the gas off.

Q. You shut the gas off from the hotel at the shut-off? A. At the curb-box.

Q. Now during the time you were engaged in these operations did you observe any fire, flame, in the lane? A. Oh yes there was a flame right along the wall.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 27.

Thomas
Templeman
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 27.

Thomas
Templeman
Examina-
tion.

continued.

Q. Will you describe that flame as well as you can? A. Well just a yellow flame. That was all.

Q. Where was it coming? A. It was coming up between the bitu- lithic and the brick.

Q. Between the pavement and the south wall of the hotel through the crack. That would be between these two? A. Yes. That was the south wall of the hotel.

Q. And that was how high do you think? A. Oh I should say about a foot.

Q. And was it steady? A. Yes, quite a flame. It was a spread 10 flame. It was not concentrated on one place. It was along the wall.

Q. Would you give me any idea of where it was along the wall when you saw it at that time? A. Yes it was both on the west side of the cellar door and the kitchen door.

Q. It was west of the cellar door? A. It was west of the cellar door.

Q. And between there and what we have as a kitchen door which on this plan appears to be west, there appears to be a door marked on this plan Exhibit 5. This is the cellar door marked "basement door" and this thing you now refer to is the kitchen door and is—I will now put "K 20 door." A. The point from the basement door.

Q. To where I have marked "K door?" A. Yes.

Q. And where was the curb-box you were working at? A. Approx- imately there (indicating).

Q. Approximately at a point I will put— A. Oh no, approximately there (indicating).

Q. I will put a little square here at the mark we are talking about. So you would be right close to where these flames were going up the wall at that point? A. Oh yes, sure.

Q. Did you see that flame, while you were working there, put out? 30 A. Yes.

Q. And did you see it light again? A. I would not say that.

Q. Did you see it put out more than once? A. I saw the flame once. I am not positive on that score.

Q. Were there any sparks from that flame? A. No.

Q. Now did you see gas flames along that wall later on during the night? A. Now what part are you talking about—between the kitchen door and the cellar?

Q. I do not mean between the kitchen door and the cellar door. I mean anywhere. 40

THE COURT: The witness has not said that he saw gas flames at all.

MR. WOODS: Well I will withdraw that question. I put it inad-

vertently. Did you see flames along the south wall of the Corona Hotel, anywhere along the south wall, coming up between the pavement and the lane and the south wall of the hotel at any time during the night later on than these flames that you have described you saw between the kitchen door and the basement door? A. No.

Q. I would ask Your Lordship's permission to show this copy to this witness as a copy of similar statements made to officials of the city because there might be some misunderstanding between myself and the witness as to what he said there.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence.

No 27.
Thomas
Templeman
Examina-
tion.

continued.

10 THE COURT: Well if for the purpose of refreshing his memory you desire him to see something which would assist his memory, if you give him that and it is a document that can be properly used for that purpose there is no objection to it. If it is a copy of an original thing he wishes to refer to I suppose Mr. Smith would be entitled to see it?

MR. SMITH: Here we have a man who gives the best answer he can and even when being questioned he insists on the position. It strikes me as most unusual that a statement he has made at a previous time should be shown to him by his own counsel for the purpose of having him contradict himself.

20 THE COURT: If counsel's instructions are such that the witness's answer might be given by reason of the failure of memory that is a reason for the rule I have referred to.

MR. WOODS: It is not the same, I may submit, as a statement given by a witness to his own counsel and so briefed. It is a statement given and similar statements have here been used.

THE COURT: Even if it were such I think you would still be right in the course you are taking. But what is your objection?

30 MR. SMITH: Counsel has no right to show him any statement he made in times gone by unless it be some notes of his own that were contemporaneous with the events of which he speaks.

THE COURT: I have said that if the document which counsel's instructions suggest is something which will refresh the witness's memory and it is a document properly to be used for that purpose, which is a matter Mr. Woods must find out first, from the witness, then and only then can it be used; but then it can be used. Of course, Mr. Woods, you will have to lay the foundation for refreshing the witness's memory. There is no misunderstanding, is there, Mr. Smith?

40 MR. SMITH: No there is no misunderstanding. I have had that ruling against me before but I still think I am right and therefore I am taking the formal objection.

MR. WOODS: Do you remember that after the fire, the day after the 22nd, that is the day after the fire, on the Monday, the fire was on Sunday the 21st, giving a statement of the events of that night of your observation of that fire to Mr. Booth the City Fire Marshal and to Mr. Ward the Provincial Fire Commissioner? A. Yes, quite probably I did.

Q. And signing it? I have here a copy. A. Probably I did.

Q. I have here a copy of the statement the original of which is in the hands of the City or Provincial Government, the proper public authorities to investigate these matters, that purports to be signed by you. Now I have been asking you whether you saw flames along that wall 10 the most of the night and your answer to me up to date has been that you did not? A. Now you are talking about the outside of the wall between the wall and the lane?

Q. Yes that is true. A. Well I did not see no flame there.

Q. And would looking at what you signed, assist your memory about whether you saw flames along the wall? A. I saw flames along the wall inside the wall.

Q. And that is quite consistent with what you told Mr. Booth and Mr. Ward. Tell me where you saw flames inside the wall? A. Now if you will come up to this map I will show you (indicating), at a point 20 approximately here.

Q. You are putting a circle near the east end? A. Yes. And also here.

Q. Another little circle on Exhibit 5? A. Yes. There were two distinct fires after the building was burned down and the firemen were re-laying.

Q. What do you mean? A. Half were in the fire hall getting changed and the other half was waiting there — two distinct fires, one very prominent fire right here, and another smaller fire approximately 30 here (indicating).

Q. To the east? A. Yes, the east end of the building.

Q. That is where you put two little circles on Exhibit 5. And you pointed to the circle west as the prominent fire and the smaller one immediately to the east where the other circle is? A. Yes.

Q. Tell us how you describe those fires? A. I was down there. One fireman called for me to come up and I went up there.

MR. SMITH: Well do not let us have any discussions with the firemen.

MR. WOODS: Do not say what the firemen said to you.

Q. As a result of something the fireman said to you— A. I called 40 Charlie Spencer of the Gas Company.

Q. What time of night was this? A. Oh it would be about half-past two probably.

Q. And what happened when you called Charlie Spencer of the Gas Company? A. I pointed this thing out to him. He never said anything. He just went right away back again.

Q. Did you say anything to Charlie Spencer of the Gas Company about any fire you saw there? A. Yes. I called him to come up there and have a look at it.

Q. Do you remember what you said to him? A. Yes if you will let me say so.

Q. Yes that is what I want you to say. A. I said: "With that God
10 damn gas there we could heat anything."

Q. THE COURT: You said what? A. "If we had that God damn gas we could heat anything."

Q. MR. WOODS: Were there bricks there? A. Oh yes from the wall, falling down.

Q. Those two flames were on the inside of the wall. Will you tell where with relation to the wall those flames were that you marked on the plan? A. Approximately two feet on the inside of the wall.

Q. And what was around those flames, what sort of debris or what material was there? A. Well there were others but where there was
20 very little debris. I think the whole thing was burnt up. It was nothing but bricks that was around there.

Q. And what was the appearance of the bricks that you saw at that time around there when those flames were burnt? A. Absolutely white.

Q. White? A. White heat.

Q. Did you see that part of the debris again later on in the morning?
A. Yes.

Q. At what time? A. Probably between nine and ten.

Q. And were there any of these flames coming up at that time?
A. No.

30 Q. Had there been anything done between times to your knowledge? Did you see any construction or anything that happened? We have it in certain evidence about that? A. No, as far as my memory carries me, no. I just made one walk around the building and then went to bed.

Q. Now sir, coming to the next day. Is it the next day the debris around the garbage burner was cleared away or was it the day after? A. I think it was Tuesday. My memory cannot carry me to any dates but I believe it was Tuesday.

Q. And you had to do with that yourself? A. Yes, I was instructed by Mr. Bragg to go to work and drain the cellar out.

40 Q. You had the job—your firm—and you were in charge? A. Yes.

Q. And was the debris around the garbage burner cleared away in your presence? A. No. I was walking back and forth. I saw the man clearing it away.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 27.

Thomas
Templeman
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 27.

Thomas
Templeman
Examina-
tion.

continued.

Q. The actual clearing was done by you? A. By a man called Nick McCluska.

Q. Who was he employed by? A. By me.

Q. Do you know where he is? A. He is right in town now.

Q. You could bring him could you? A. Oh yes.

Q. And how soon after the garbage burner—the debris around the garbage burner was cleared away—did you see the door of that garbage burner. A. Whenever he got down to the garbage burner. His instructions were not to touch anything, to go to work and clear the debris away and touch nothing and whenever he went to work and got the door, to come and tell me about it. 10

Q. And that happened? A. Yes.

Q. And he came right along? A. He came and told me that he got the door.

Q. There has been an exhibit here put in—19—by myself. And I am asking you to look at it and asking you to tell me whether that was the appearance of the garbage burned immediately after the debris was cleared away? A. Yes, that was after the debris was cleared away. The debris was practically up to the level or maybe a little over the top of the garbage burner. You could not see the garbage burner after the fire. He dug away here. This door on the top is where the stuff is put into the burner and the door lower down is where you put the fire in to burn the garbage. 20

Q. And were both doors closed? A. Yes both doors were closed.

Q. And did anybody open the door then that you saw after it was closed? A. Both Fire Marshal Booth and Mr. Ward was there when we opened the door. I could not say who just opened it.

Q. But it was opened? A. Yes, it was opened in our presence.

Q. And did you look into the garbage burner? A. Looked into the bottom door, yes. 30

Q. Well was the other door opened at all, do you know, the one where the garbage is put in? A. No, I do not know if we touched that door. I believe there was something lying up against that door.

Q. And you did look in at the bottom door? A. Yes.

Q. Where they put in the material to burn? A. No, where they put in the coal.

Q. Where they put the coal in to burn the garbage? A. Yes, where they put the coal in to burn the garbage.

Q. And tell us what the appearance of that bottom part was. A. The ashes in the fire was just as if they had burned out naturally and it was a fine ash all over the grate, absolutely level. 40

Q. Did they seem to have been in any way disturbed? A. No.

No cross-examination.

No. 28.

Evidence of John Booth.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence.

No. 28.
John Booth
Examina-
tion.

continued.

JOHN BOOTH, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. You are fire marshal of the City of Edmonton? A. Yes, sir.

Q. And you have been with the City for a number of years? A. Twenty years.

Q. When did you get to the Corona Hotel fire? A. The first time I got to the Corona Hotel fire was about 10:00 p.m. on the 21st.

10 Q. And what did you find at that time? A. At that time the smoke was belching from the Motor Car Supply out through the front door and the firemen were standing in front there playing their lines of hose into the Motor Car Supply.

Q. How was the rotunda of the hotel? A. I went into the rotunda and the smoke was fairly thick in there, thick enough that you would not want to stay there very long.

Q. How about the barber shop west? A. I went into the barber shop west and there was no smoke there.

20 Q. And then what did you do? A. There was no one in the barber shop so I made inquiries for the proprietor of the barber shop. They found him and I asked him to remove some of his equipment from there because of the possibility of it being burned up. After a little persuasion he moved some of it out. He thought it was insured and it would be all right anyway. I convinced him it was better for him to move it out anyway.

THE COURT: Is he a plaintiff?

MR. MILNER: Yes.

30 MR. WOODS: Go on. A. And from there I left him and went into the frame building to the west and they were busy then moving stuff, furniture and so forth out of that house. I went upstairs and spent some time there.

Q. And the fire got worse did it? A. Yes it got worse. It caught hold of a corner of this house to the west and I went around to the back and assisted the firemen in getting a line on to that house and then an explosion occurred on 7th Street.

Q. That is when the first explosion occurred was it? A. Yes, the explosion occurred then.

40 Q. Could you give us any idea? Do not if you cannot but if you can, do, of how long it was after you got to the fire that this explosion occurred? A. I could not give you the correct time, no.

Q. All you could do was to tell us what you would do in the meantime, and you have? A. Yes.

Q. And when did you go over to the Balmoral Block? A. Shortly after that I went around to the front of the building and saw that the fire had assumed such proportions that the awnings of the Balmoral Block were burning, that is the awnings in front of the stores. I went up into the Balmoral Block and assisted in getting a hose line through to the front of that building to protect the front of it.

Q. And after that you went to the lane to assist the firemen? No.

Q. You went to the Balmoral Block before you went to assist them at the house? A. No. I have given it to you in the sequence. I went to the house and then the explosion and a short time after I was at the house I went to the Balmoral Block. 10

Q. Looking at the statement you made for the chief of the Fire Department and what you said on the 28th February—would that help you to re-construct? A. The statement I made in the first part might lead you to believe I went to the Balmoral Block before I went to the—

Q. Well it leads me to believe that you went to the Balmoral Block and did this work there before you heard this explosion? A. Yes you would believe that. But I went to the Balmoral Block after the explosion.

Q. And did you investigate that explosion? A. No I did not investigate it. 20

Q. Well did you find out? A. I formed an opinion of my own at the time.

Q. Did you go to find out what it was? A. Well I went down to the lane and someone told me that the manhole blew up. That is all. I did not do anything further about it.

Q. And that is all the information you can give us about your activities on the night of the fire? A. Yes, that is all. I went home after that.

Q. And the next morning you did begin an investigation into the causes of the fire with Mr. Ward the Provincial Commissioner? A. Yes, sir. 30

Q. And made certain statements which we have been referring to? A. Yes, sir.

Q. And what operations did you see being carried on in the morning and through the morning by the Gas Company? A. When we arrived there the Gas Company were digging a hole on 107th Street.

Q. In the centre of the street? A. In the centre of the street, presumably to locate the leak of gas.

Q. We have had evidence given in fact about that. That was the hole that was dug in the centre of the street, the last hole that was dug? A. Yes. 40

Q. And opposite the lane at the rear? A. Yes.

Q. And when you arrived there they were just starting to dig that hole or had they been digging it? A. I think they were digging at that time.

Q. They had not yet found the break? A. No, sir.

Q. And what time was it you arrived? A. About nine-thirty or ten o'clock.

Q. Had they opened the other holes previously to that, from your investigation? A. Yes.

Q. The hole on the east side of 107th and the hole on the west side of 107th Street? A. Yes, sir.

Q. And there had been a hole opened at the shut-off valve in the lane as we find it? A. Yes, sir.

10 Q. Did you notice the vent pipe of which evidence has been given here? A. I did.

Q. You noticed that being there when you got there? A. Yes, sir.

Q. And it, as we already have in evidence, is at a point marked "A" on one of these plans there at this point here in the lane? A. Yes.

THE COURT: That is Exhibit number what?

MR. WOODS: Eighteen.

Q. And were you present when the hole was opened at the centre of the street? A. When the gas leak was exposed, yes, sir.

20 Q. And Mr. Garrett puts the time of that as between one and two in the afternoon? A. It would be around that time, yes.

Q. And what appeared when the hole was opened? A. Well there was dust rising in the hole, a sort of a dust or sand—a very light sand.

Q. What was that caused from? A. It was caused from the gas leak from the main.

Q. Through a hole through a crack? A. Through a break in the main.

30 Q. And was the gas blowing anything? A. Yes. I went down into the hole and there was a crack and welded joint for about, I should say, six inches from the bottom to the north up the side of the pipe. And I put my finger around there, I did not hold it very long, it would have froze, it was so cold, the gas was coming out at such a force through that hole, and it was disturbing the dirt around the side.

Q. That is what was disturbing the dirt and making the dust. It was coming out at considerable force? A. Yes, sir.

Q. Now referring to the blueprint Exhibit 10. There is marked on that street railway return cable in a six by ten wooden box. Did you observe that there? A. Yes, I did, that is to the north of the pipe already mentioned.

40 Q. And how far away from it? A. I would say about three to four inches.

Q. And it was running parallel with it as shown? A. Yes.

Q. What was the condition of the casing of that box or of the wood in the box? A. It was in poor condition at this point. It had been dis-

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 28.
John Booth
Examina-
tion.
continued.

turbed by someone while digging the hole because it was partly broken, but the condition was poor. I would say it was partly rotten.

Q. Now did this gas escaping from the main that was broken, as you saw there, make any noise in escaping from that main? A. Oh yes.

Q. Will you describe it? A. It is pretty hard to describe.

Q. Well what is a general description of it? A. A sort of a loud hiss, a loud blow. It is hard to describe, you know.

Q. Had you noticed fumes coming up out of the vent pipe before this? A. Yes, I had. 10

Q. And when the cut was made at the centre of the street by the Gas Company what happened to the fumes at the vent pipe? A. They quit. They ceased to come out of the top.

Q. Now did you examine the south outside wall of the hotel? A. Yes I did.

Q. And what did you notice there? A. I noticed there was a crack between the concrete or asphalt pavement and the brick wall varying from about an inch and a half to nothing. It varied as it went along.

Q. And you had been taking statements from firemen? A. Yes, sir. 20

Q. And from Mr. Templeman and others of what their experience was in the course of their duty? A. Yes, sir.

Q. And you had taken statements from them with respect to seeing flames along the south wall? A. Yes, sir.

Q. As we have it in evidence. And did you connect up that crack or crevice that you found there with the place that they had told you they saw the fire? A. Yes, sir.

Q. MR. SMITH: My Lord, I do object to this, "connect up the place which you saw" in respect of something he has not told us of. This may be one of my friend's experts. I don't know. 30

MR. WOODS: No, it is not. But I want to identify the fact that there was a crevice. There was a crevice between the south wall and the pavement? A. Yes, sir.

Q. And to make it intelligible it is the same thing that is in evidence by yourself through the witness who gave a statement as to the fire coming up at that place. He took a statement.

MR. SMITH: I am not complaining about the intelligence of the Court.

MR. WOODS: Did you examine the hotel construction at any time in a general way and can you verify for me the plans? Let me get the basement plans. This is Exhibit 4. What was the shape of the basement of the hotel? A. It was the shape of a letter "T" that is the partition 40

and unexcavated on either side and fully excavated portion on the north.

Q. As shown in Exhibit 4? A. Yes.

Q. The south wall of the hotel was of what construction? A. Brick construction.

Q. And what openings were there below the first floor level? A. Three openings, that is coal chutes.

Q. In the lane as shown here? A. Yes.

Q. Fairly correctly on this Exhibit 4? A. Yes, also a door.

Q. There were doors leading from the basement to the lane? A. Yes.

10 Q. And also we have evidence of a door from the kitchen to the lane? A. Yes, sir.

Q. Now about these coal chutes. Two of these coal chutes—were all of them used as coal chutes? A. No, just two.

Q. Which two? A. The two westerly.

Q. And what were they lined with? A. Concrete.

Q. And what was the bottom of them? A. Wood on top of dirt.

Q. Now the third opening further to the east. How far was it approximately from the east wall of the basement? If you have any notes you are entitled to refer to them.

20 MR. SMITH: I think my friend means if he has any notes made at the time.

MR. WOODS: Made at the time for the purpose of making a report. He made his report of which you have a copy on the 28th of February. Have you any objection to his refreshing his memory from it?

MR. SMITH: None whatever.

THE WITNESS: I have here—the elevator door was east of the manhole.

30 Q. And my friend has not any objection to you referring to this. I am showing you a copy of your report and you give it as approximately eight feet from the east wall of the basement? A. Yes.

Q. And that is the one that is shown here on Exhibit 4—the east of these constructions? A. Yes, east of this hole.

Q. And that you found had been used in what way? A. My information was that was a dis-used air shaft.

Q. And was there any top to it? A. Yes there was a cover on it.

Q. And was it in use at the time of the fire? A. My information was that it was not.

Q. What was it lined with? A. It was brick lined and wooden at the top—wood on top of dirt.

40 Q. Not concrete lined, brick lined? A. Yes.

Q. Was it keyed into the basement wall? A. No, sir.

Q. What would you say as to there being any aperture between it and the basement wall? A. There was an aperture between the brick and the basement wall.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence.

No. 28.

John Booth
Examina-
tion.

continued.

Q. That is to say, a crack? A. Well being not keyed it had left the basement wall.

Q. MR. SMITH: After the fire, this is?

MR. WOODS: This is on the Monday morning? A. Yes, on the Monday morning.

Q. The fire really was out when you were investigating? A. Oh yes.

Q. Now did you notice any other openings on the south wall of the building? A. There was a place where the conduit from the electric light and telephone came through. There was one place there where they had cut through the brick wall and pushed the conduit pipe through possibly an inch and a half pipe and that had never been sealed up. It had just been left. 10

Q. I have a picture of that that might be useful. I have a picture of that taken shortly after. Does that represent much what you saw there? A. Yes, this is the conduit here.

Q. As shown? A. Yes, this is the conduit coming through at the point where the arrow is.

Q. In the photograph marked Exhibit 7? A. Yes, this is also the conduit going into this one on photograph No. 8. 20

Q. And those two pictures form a good representation of what you are now referring to, do they, and the openings where the electric light and telephone conduit came through the wall about three feet below the first floor level? A. Yes.

Q. And those were not sealed on entering the basement? A. They were not cemented around. There was a hole there and they were put through the brick wall.

Q. And there was an opening through the wall? I tender two pictures identified as being pictures—

MR. SMITH: I register an objection to these photographs. The objection is this that they are the photographs of a condition after a very severe fire like this and it may be and it certainly is, without further evidence, of no value as indicating the condition of affairs prior to that fire. What I have in my mind is this, I am quite sure there must be someone who has a knowledge of these things prior to the event. Now it is a case in which we must be very particular in knowing the conditions through which the gas might have come or might not have come, rather than after the action—after the action of heat and debris and fallen walls. I am objecting. 30

THE COURT: I think they are admissible as photographs, the witness having said they show a correct representation of the locality where the electric and telephone conduit pipe went through. So far as his statement that the holes had not been cemented around the pipe after the 40

holes had been made and the pipes put through, I take it that all he says is that that is how they appeared to him at the time after the fire when he saw them for the first time. It does not go the length of saying that was the condition before the fire.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

MR. WOODS: It goes to the weight of the testimony. He saw them within a few hours on the morning of the 22nd of February and he says that at that time the holes through which these things went were not cemented. I was putting those things in for information to show the picture of the thing that he is directing his evidence to.

No. 28.
John Booth
Examina-
tion.
continued.

10 MR. SMITH: My information is that the morning after the fire nobody could get in there, not until the next day. I was wondering whether he was not mistaken as to a day.

THE WITNESS: No, sir, I started right in.

THE COURT: Do I understand you are referring to these large holes there? A. This small hole would be where a joist had been in. But this larger hole is the coal chute and the conduit is right alongside this coal chute hole.

Photograph of wall showing light conduit, No. 7, marked Exhibit 21.

Photograph of wall showing light conduit, No. 8, marked Exhibit 22.

20 THE COURT: Of course if anything turns on the question of the condition of the aperture around the pipe before the fire this does not assist very much.

MR. WOODS: That is the picture?

THE COURT: Yes, nor what the witness says. He says that the appearance to him was that they had not been cemented around.

MR. WOODS: I think he goes further than that.

THE COURT: Well I think he had better go further himself rather than by explanation of what he has said.

30 MR. WOODS: We were speaking of the openings in the south wall of the building and you mentioned the openings where the electric and telephone conduit came through the wall? A. Yes, sir.

Q. And that would be how far below the first floor level? A. About three feet.

Q. And you saw those openings on the morning of February 22nd? A. Yes, sir.

Q. Immediately after the fire? A. Yes, sir.

Q. We have had evidence of how long the fire lasted and when it got under control and all the rest of it up to that morning and it was about at what time in the morning that you saw these openings in the south wall

where the electric and telephone conduits came through the building?
A. Any time after nine-thirty when my investigations started.

Q. Some time between nine-thirty and noon? A. Yes, sir.

Q. And will you tell the Court what the appearance of these openings was to you as to whether they were openings, whether the pipe had been cemented or whether it had not? A. It seemed to be that the pipe had been put in there and not cemented. It was a ragged sort of hole just as if it had been driven through the brick work.

Q. That is the hole as you saw it? A. As I saw it.

Q. Did it leave an opening in the south wall? A. There was an 10
opening on the side of it, yes.

Q. Were you present at the taking of the smoke test? A. I was.

Q. Were you present when Robert Templeman gave his testimony here in Court about the smoke test? A. I was.

MR. WOODS:

Q. Mr. Booth was permitted to remain by consent of both sides during the giving of the evidence of the firemen, My Lord.

Q. What would you say as to whether the smoke, in your observation, travelled along the conduit box during that smoke test? A. I would say that it did travel along the conduit box.

Q. What would you say as to whether the smoke during that smoke 20
test permeated the box—came out from it? A. I would say it did.

Q. And what would you say as to whether the smoke during that smoke test came through the ground and through the south wall of the hotel building, such as remained? A. It came through the wall by the dis-used air shaft.

Q. By the dis-used air ventilating shaft to which you have referred?
A. Yes, sir.

Q. And you saw it? A. I might correct myself in saying coming through the wall—came through the side of the chute where it was abut- 30
ting outside the wall and into the chute and then into the basement.

Q. And did you observe that smoke coming through on both sides of the chute? A. Yes, sir.

Q. And did you observe it coming through any other cracks in the brick work? A. Yes, sir.

Q. Would you say as to that point where the dis-used coal chute was or dis-used air ventilating shaft—whether the smoke from the conduit box during the smoke test was coming through freely or otherwise? A. I would say coming freely.

Q. Now, sir, coming to that part of your memorandum in which you 40
refer to taking statements from the firemen? A. Yes.

Q. James Christie? A. Yes.

Q. And it has appeared there were two statements given to you by Christie? A. There was.

Q. One on the day of your investigation? A. The 22nd February.

Q. And one on the 25th—three days afterwards? A. Yes.

Q. And those statements have been referred to here in the examination of Mr. Christie by my friend? A. Yes, sir.

Q. And speaking of Christie, my friend spoke of the second time that you and Ward saw Christie. Do you remember? A. Yes, sir.

Q. And I am reading you what he then said to Christie. Speaking of you and Ward he said that they demonstrated to you or convinced you that the door of this burner, speaking of the garbage burner, was fastened
 10 shut by an iron bar "and then you told this other yarn about the other explosion." Christie's answer was, "I don't remember the iron bar." My friend went on. I am reading what he said to Christie, "Then they told you it was locked shut, they said it was closed. After the fire they found this thing closed and told you about that and then you changed your mind and you told this story?" "A. I don't know when I changed my mind. I don't remember when they told me that." Now will you tell the Court whether that suggestion or statement made by Mr. Smith to
 20 Mr. Christie is right when he says that you and Ward demonstrated to Christie or convinced him that the door of the burner was fastened shut by an iron bar and that it was after that that Christie told the other yarn, as he puts it, to correct his statement about how the fire started?

MR. SMITH: Now I am objecting to a question of this form. My friend may if he wishes put in a question which I asked Christie and then he will have Christie's answer. But he must have the answer. He can then ask him if that is a fair representation of fact, but no further than that. Any question I may have asked without the answers is meaningless. I am quite content he should go through that and I will let him contradict his own witness, Christie, if he wants to, but it seems to me—

MR. WOODS: I am quite content to read all I have transcribed of
 30 it and if it is desired by my friend or the Court, I thought it would be a fairer way to put the matter, I will read what his questions to Christie are and his answers and ask Mr. Booth what the fact is about it.

THE COURT: What the fact is about what—what he told Christie?

MR. WOODS: No, about whether Christie did correct his story without a suggestion from Booth or whether, as my friend has said in this that it was Booth and Ward that demonstrated to Christie or convinced him that the door of the garbage burner was shut before he corrected his statement.

THE COURT: My difficulty is to know what right you have to do
 40 that in chief with this witness.

MR. WOODS. I think if my friend chooses to employ that kind of cross-examination I am entitled to take his very questions and

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence.

No. 28.

John Booth
Examina-
tion.

continued.

answers and ask this witness—as he himself admitted whether it forms a correct statement or not. It might be hearsay, if my friend had not opened it in the way he did. But if he takes a chance on using that form of cross-examination he opens it to me to ask any witness, “Does that form a correct statement or not?” I would be very unfair if it were not—for a person to make a suggestion of that kind.

THE COURT: It is said there is sometimes a good deal of unfairness may arise from proper cross-examination. That is something no Judge can correct, and for the moment the only thing I can do is allow you to take a course properly open to you and I am not sure whether the course you are proposing to take is properly open. 10

MR. WOODS: My friend has no objection. He has not objected to it on any other ground than that all I should do is to read the whole of his questions and answers, and I am prepared to do that.

MR. SMITH: I do not know of any better way. But the point I have is this. It is not evidence; he is entitled to ask this witness what took place but I thought if there was any suggestion of unfairness in anything I said to Christie and he wants a better way, I do not mind him trying.

THE COURT: I do not think the course you took was unfair in any sense. I think it was perfectly proper cross-examination on the instructions you had and which appeared to be, to some extent at least, perfectly justified. It did not appear to me to be unfair in any sense. But that is neither here nor there. But you have no objection to Mr. Woods going on and clearing up what took place between this witness and Christie at the time of the taking of these statements? If you have no objection to that I will permit it to be done. 20

MR. SMITH: I have no objection to it whatever if he wants to ask this man in a proper way what took place.

THE COURT: Well my position is if you object it cannot be done, but if you don't object, as I understood you were, then I will permit it to be done. And I think you are taking a very fair course in not taking an objection. 30

MR. WOODS: I will read the whole of what I have transcribed.

MR. SMITH: You do not need to read any more than you have unless you read the answers.

MR. WOODS: This is a portion of the examination of Christie: “The first time you corrected it was on the 25th of February when Mr. Booth went back to see you again? A. Yes.

“Q. And did he have a photograph with him of the basement of that hotel? 40

“A. No, no photograph.

"Q. He told you no doubt that they had found the garbage burner with an iron bar propped up against the door and holding it shut?

"A. I don't remember that.

"Q. That they demonstrated to you or convinced you that the door of this burner was fastened shut by an iron bar and then you told this other yarn about the other explosion."

MR. SMITH: Should not the witness be asked if he disagrees with these answers?

10 THE COURT: That is what I understood Mr. Woods would do— he would make a general statement.

MR. SMITH: Well could he make a statement—however, I won't say anything more.

MR. WOODS: (Reading): "They demonstrated to you or convinced you that the door of this burner was fastened shut by an iron bar and then you told this other yarn about the other explosion?"

"A. I don't remember the iron door.

"Q. They told you it was locked shut?

"A. They said it was closed.

20 "Q. After the fire they found this thing closed and told you about that and then you changed your mind and you told this second story?

"A. I don't know when I changed my mind. I don't remember when they told me that.

"Q. They took the second statement from you, didn't they, on the 25th February?

"A. Yes.

"Q. 'With regard to my first statement I gave you on February 22nd I would like to correct it in a few details.' That is what you said?

"A. Yes.

30 "Q. So your correction in a few details was to tell a completely opposite story to the one you told the first time. Who used the word 'details?' You or Mr. Booth or who?

"A. Well I probably did.

"Q. Don't flatter yourself now, but did you work that out that way?

"A. Yes.

"Q. And you told them the story you have told here today with respect to this explosion?

"A. Yes."

Now will you state what happened in that regard between you and Christie at the time you went to take this statement?

40 THE COURT: I understand that this is going in without objection, really going in by consent?

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 28.
John Booth
Examina-
tion.
continued.

MR. SMITH: What I consented to was to have my friend read these questions and answers to this witness and ask him if they were correct.

MR. WOODS: Are these questions and answers of Christie's correct?

THE COURT: Or the answers which Christie made to these questions correct? A. I think fairly correct, not absolutely in every detail.

Q. MR. WOODS: Now will you tell me whether the correction of Christie's statement made as told there on the 25th February was made before or after—did he make his correction of his statement with a knowledge from you or Ward that the garbage burner was found to have been closed, that the door was found to have been closed? A. No, sir, we did not go there with the impression of telling him that the door was— 10

THE COURT: Now answer the question please. It is categorical and I am in a delicate position at the moment.

(Question read). A. I don't know where I am now.

MR. WOODS: Christie made a correction in his second statement of how the fire started. You know that? A. Yes, sir.

Q. He had said in his first statement to you on the 22nd of February that he opened the door of the garbage burner? A. Yes.

Q. And on the 25th of February he corrected that statement stating to you and Mr. Ward that that was not correct—that he had not opened the door of the garbage burner—that he had heard a hissing noise in a certain place and that he had investigated to find out what it was by lighting a match and seeing what it was. You remember? A. Yes, sir. 20

Q. That is a correction of his first statement? A. Yes.

Q. And that is the correction to which I am now referring in this question which I am going to ask you. Was Christie informed by you or Ward or by the showing to him of any photograph, or in any other way, before he made that correction in his statement that in point of fact the door of the garbage burner had been found closed when the debris was cleared away? A. No, sir. 30

Q. Did you show him any photograph at all? A. No, sir.

Q. Was Christie's statement on the 22nd of February when you and Ward interviewed him—how would you describe it? A. Very excitable.

Q. Were you present at a test made with steam to determine at this point from the place where this break was down to the Corona Hotel as to whether the hissing from the steam could be heard? A. Yes.

Q. When was that? A. Well I could not give the day it occurred. Mr. Ruff was in charge of that.

Q. But you were present? A. I was there. 40

Q. And the object was to see how far the sound carried down that conduit box? A. The object was to see if we could detect any sound in-

side the basement from that noise up where the leak of gas had been.

Q. We will get that from Mr. Ruff? A. Yes, Mr. Ruff is in charge of that.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence.

No. 28.
John Booth
Cross-Ex-
amination

CROSS-EXAMINATION BY MR. SMITH.

Q. First, with respect to the smoke test. Would you mind—you told my friend Mr. Woods that the smoke came through at the sides of the chute, came through into the chute at its connection with the brick wall, as I understand it? A. Yes.

10 Q. Then my friend asked you if smoke came through in any other place and you said yes and I think you indicated the spot where that came through. Now just where was that? A. No other place outside the chute.

Q. Then I misunderstood. Smoke came through at the chute? A. In the chute.

Q. And at no other place in the back end of that building? A. No other place I saw.

Q. And you were there for the purpose of seeing? A. Yes. I did not see any.

20 Q. And while this smoke test continued you were walking up and down there and you could find no other place except at the sides of this dis-used chute? A. No.

Q. There was none for example behind the Motor Car Supply Company? A. It was unexcavated in there. I was just in the portion where there was basement.

Q. You saw no smoke arising from the ground where the Motor Car Supply Company had been? A. No, sir.

30 Q. We had a couple of fellows telling us about some fires and that is why I asked you. Now when this smoke test was put on and the smoke forced out to the Corona Hotel basement down the sides of the dis-used chute, that ground was then thawed out? A. I would not say so.

Q. I think one of the witnesses said it was, who was here before you. I may be wrong about that, but I have it in mind that one of the witnesses already told us that the ground behind the hotel was not frozen. Am I wrong?

MR. WOODS: Maybe one of the witnesses said the ground was not frozen behind the hotel at any time.

MR. SMITH: No, he did not say that.

MR. WOODS: Well there will be evidence along that line.

40 MR. FRIEDMAN: It is in some report and it has not been given in evidence.

MR. SMITH: I will not go into that unless you know yourself? A. I don't know. I was not digging into it.

Q. You never saw any smoke rising from the ground in all this smoke test back of that hotel property? A. The only place I saw the smoke was at the dis-used air chute.

Q. Now was that conduit box plugged when the smoke test was made? A. I don't know.

Q. You don't know? A. No.

Q. Who was in charge of that? A. Mr. Ruff and Mr. Templeman.

Q. You were merely observing and you do not know whether it was plugged up or not? A. No. I was in the basement most of the time. 10

Q. Now I suggest to you—by the way it is your business to investigate how fires are caused? A. That is what it is.

Q. I make this suggestion to you that all the time you were at the fire that night you never heard from anybody that it was a gas fire? A. No, sir.

Q. And you were assisting firemen at odd times? A. Yes I was doing what I could to assist the different people in the different buildings.

Q. And you saw the chief of the fire brigade next day? A. Yes in the morning in the office. 20

Q. And he told you it was a gas fire? A. He told me there had been gas there.

Q. That is the first person who told you that? A. Yes, sir.

Q. And you told me that as far as the smoke test was concerned you did not know whether it was plugged there or not? A. No, sir.

Q. And this Corona Hotel Building was a very bad fire risk, wasn't it? A. I would not say very bad fire risk.

Q. Well it is a very old building? A. It is an old building.

Q. With a lot of wooden construction? A. I could tell you the day from my notebook when it was built. 30

Q. About 1906 wasn't it? Wasn't it an apartment block first—or in that neighborhood? A. June 16, 1908.

Q. And I think some two years ago you insisted upon them fixing their elevator shaft to comply more with prevention conditions? A. Yes I suggested in the line of prevention that the elevator which was lined with wood be covered with metal.

Q. And that was done in fairness to the company? A. Yes that was done. I made several suggestions and they always carried them out.

Q. Now you arrived at this place about ten o'clock and you were around about that fire two hours or more? A. I was around there several days. 40

Q. But during the course of the fire you were there several hours? A. Oh I was home by midnight.

Q. I want you to tell me where you thought the main fire was, in

the Corona Hotel or in the Motor Car Supply Company? A. I couldn't tell you.

Q. You did not form an opinion? A. I did not make it my business to go around that part of the building.

Q. You did not form an opinion about it and that is the end of it as far as I understand? A. Yes, sir.

Q. Now I imagine it will be common property. In how many places did you see this wooden conduit box. I think more than one? A. Oh there were several openings along the lane.

10 Q. You told my friend Mr. Woods the condition of the box at the centre of the street where the gas company had gone down, and, as I understood you, aside from some damage they had done it by striking it with a drill it generally was in poor condition and fairly rotten? A. Yes.

Q. And you have described that box in other places in which you saw it? A. There was some spots that it was good. There was other places it was not so good.

20 Q. In other words, there is no doubt in your mind that gas escaping at the intersection of the street could get into this box. That was its condition? A. Yes.

Q. And to be fair to everybody it is equally probable it could get out again if it had a place to go owing to the condition of the box in other spots? A. Yes.

Q. There is no doubt at all that the conduit box at that time maintained by the City of Edmonton was a sort of sieve so far as carrying gas or anything in the nature of air was concerned. Would that be a fair way to describe it? A. Yes, I would say, because it was not built for that purpose.

30 Q. The moisture would also go through that box, the moisture in the air? A. I believe so.

Q. And I did not quite understand this sound test. Just tell me what was done? A. Well there was talk of this, I think Ward and I requested Mr. Ruff to give us a sound test at the excavation at 107th Street because of the hissing noise that was heard.

Q. Well just what did you do? A. They used the same line at the excavation of 107th Street.

40 Q. But what I had in mind was what next did you do? Did you put your steam line down to the pipe? Was that the way it was done? A. Yes, that is the way it was done. But I think Mr. Ruff and his men who were doing that would be better able to tell you. I was not at that end of it.

Q. You were down listening somewhere else but you were not there where the noise originated? A. No.

Q. And speaking of wall conditions. I suppose there must have

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 28.

John Booth
Cross-Ex-
amination
continued.

been considerable heat in that building that night? A. It looked like it the next morning.

Q. There would not be any doubt about that. A. No, sir.

Q. And I suppose there is no doubt that walls made of brick subjected to severe heat in the first place, it may have some effect upon that wall? A. Yes, it may.

Q. In other words, it may warp it and it may crack it? A. Yes it may, the heat and the water striking.

Q. The heat and the water put that wall out of line. A. Yes.

Q. And there is no doubt whatever that the heat or the heat and 10 water combined will crack brick walls? A. I have seen it, yes.

Q. In fact there is no doubt whatever about this very wall itself, after the fire, I am looking at Exhibit 21—you can see the bricks have shifted and fallen out. Can you see that? A. Oh yes.

Q. And there is no question about that. And I am showing you a photograph which I think covers one of those conduits and which gives us a better idea of the situation? A. That is better, yes.

Q. And that is the conduit you referred to when Exhibits 21 and 22 were marked? A. Yes.

Q. And I am going to tender this photograph as Exhibit 23. 20

Photograph of wall at point where conduit enters, marked Exhibit 23.

Q. I will prove the date of this photograph, shortly. That is a fair representation of the conduit? A. Yes.

Q. And of the wall in its neighborhood? A. Yes.

Q. And there you can see where the bricks have fallen—the wall has fallen apart. You see it if you look at it carefully. That is a fair representation of the condition of that wall after the fire? A. Yes, that is a fair representation.

MR. WOODS: You will have someone to show when this photo- 30 graph was taken?

MR. SMITH: Yes. I think the notation is the 25th of February.

THE COURT: Take Exhibit 23. Can you tell me which is the electric light and which is the telephone? Am I right in thinking it is these two side by side (indicating)? A. Yes, but I cannot tell you which is which.

Q. It is pretty hard for me to reconcile these three photographs. If you look at them they seem quite different and the difference does not seem to be accounted for by the time they probably were taken? A. The debris seems to be moved away from the front of the large one and it is not moved away in front of the small one. 40

Q. MR. SMITH: Probably you will recognize another view of the south wall of that hotel, and are these pipes which I am indicating in

the left hand side of the picture the same conduits? A. Yes.

Q. That gives a good idea of where it goes through the wall.
A. Yes.

Q. And does that give a fair representation of the condition of the wall after the fire? The date is the 25th? A. Yes, that is a fair representation.

**Photograph of rear wall showing door and conduits underneath,
marked Exhibit 24.**

10 Q. The conduit pipes that you refer to, looking at Exhibit 24, are the pipes almost directly underneath the smaller door which appears on the photograph? A. Yes, it is a dis-used door.

Q. They are almost directly underneath, they appear to be almost directly underneath, the only door which appears on the left hand side of the photograph. A. Yes, that is it.

MR. WOODS: That is the basement of the door? A. Yes.

20 Q. MR. SMITH: And I spoke to you about brick walls going out of line. There is no doubt whatever that fires do cause changes in physical structures whereby ingress and egress for gas or air might be made. That is, you will by heat and water form cracks which were not there before through which gases might pass. There is no doubt about that? A. You are talking of after the fire or during the time of the fire the building may in some way settle.

Q. I was merely speaking of the results of a brick wall as we know them by fires on cracks? A. Yes, if there is excessive heat.

Q. And there is no doubt that after the fire this was rather a sad looking wall. They had to take it down? A. Yes, they took part of it down.

Q. It was of no value; it could not be used again. And that was as a result of the fire? A. As a result of the fire it had to be destroyed.

30 Q. On this Exhibit 24 the last photograph my friend showed you, which was used for the purpose of identifying on it the electric light and telephone conduit I am pointing now to the extreme left of that picture and a place there right underneath the fallen steps. Is that the dis-used coal chute? A. That is the dis-used air shaft.

Q. I want you to disregard what has been written in red ink on this photograph. But it is in the same place? A. Yes.

Q. But it shows the dis-used coal chute quite plainly at that outside point? A. Yes, sir.

40 Q. Is that not the door of the basement or am I wrong? A. It used to be a door and the top portion was used as a window. This was boarded up. I think that had been used as a door prior to the raising of the grade in the lane. The doorway you refer to is west of the larger door here and came out of the kitchen.

Q. And this larger door here, is this the basement door? A. Yes.
Q. And these electric light and power conduits came into the wall at the distance shown on the photograph east of the basement door there? A. Yes.

Photograph of wall showing conduits, marked Exhibit 25.

At 12:25 Court adjourns till 2:00 p.m.

At 2:00 p.m. Court resumes.

No. 29.

Evidence of Albert Dutton.

ALBERT DUTTON, being called as a witness on behalf of the 10 plaintiffs and having been duly sworn was examined by Mr. Friedman and testified:

Q. You are Chief of the Edmonton Fire Department? A. Yes, sir.

Q. How long have you been chief of the fire department? A. For five years now.

Q. And how long have you been in the service of the fire department? A. Twenty-three years.

Q. You remember the night of the Corona Hotel fire? A. Yes.

Q. Were you at No. 2 fire hall that night? A. Yes, sir.

Q. The evidence is that an alarm came in at 9:11? A. Yes. 20

Q. Did you respond to the first alarm? A. No, sir.

Q. Did you go over later? A. Yes.

Q. What time did you get there? Do you remember? A. Well I should judge possibly between five and ten minutes after the first alarm.

Q. And what part of the building or premises did you first go to? A. I went in the lane at the rear of the Corona Hotel.

Q. And what did you observe there? A. Well when I got out of my car I saw flames coming through the ground I would judge about the centre of the lane diagonally going towards the south wall of the 30 hotel.

Q. Where were those flames—in about the centre? A. I judge in about the centre of the lane, maybe a little over towards the hotel and travelling towards the south wall of the hotel.

Q. And did you make an investigation there of the fire at that time? A. Not right away. I got in touch with my driver and told him to phone for the other booster pump from headquarters.

Q. That is you sent for some more equipment? A. Yes.

Q. At this time do you know what equipment had responded to the first alarm? A. Four pieces, a booster pump and a combination which 40 carries hose and chemical, the aerial ladder and service ladder truck.

Q. Those four pieces had responded to the first alarm? A. Yes.

Q. And you sent for some further equipment? A. Yes.

Q. What was that further equipment? A. Well I did not like the looks of the smoke.

Q. Well what was the further equipment you sent for? A. Another booster pump.

Q. Your first examination was made in the rear of the premises? A. Yes.

Q. Just tell us what you observed? A. There was flames coming up through the coal chutes. There was also flames in several places around the stairway leading down into the basement. There was also flames close to the elevator that goes down to the basement.

Q. That is the elevator shaft? A. The elevator shaft, yes.

Q. And were there hose lines packed in there when you got there? A. There were two hose lines.

Q. And were they playing on these flames? A. Yes.

Q. And did you get some more? A. Yes.

Q. And after observing what was going on at the back I suppose you gave your instructions to your deputies or to your men there? A. Yes.

Q. What did you do then? A. I went around to the front to Jasper.

Q. Did you go into the hotel from the front? A. Yes.

Q. Where did you go? A. I went into the rotunda of the hotel and then I turned around and went into the Motor Car Supply.

Q. Into the store occupied by the Motor Car Supply? A. Yes.

Q. Was there any fire in the Motor Car Supply? A. No indication at that time.

Q. And where did you go? Did you go downstairs? A. No. I went right as far as I could to the rear.

Q. And walked through on the ground floor? A. Yes.

Q. And there was no fire there? A. No.

Q. And no indication of any fire? A. No.

Q. That is on the ground floor? A. Yes.

Q. Was there any indication so far as you could tell by sound or any other way of any fire in the basement? A. No, not in the Motor Car Supply.

Q. Were you in the kitchen of the hotel at all? A. Yes. I went back to the rear again and by this time I saw Mr. Philpot and Mr. Templeman trying to get down to the box of the valve to shut off the gas on the domestic line in the lane.

Q. And that was shut off, was it? A. Yes. Well I assume it was.

Q. And where did you go then? A. I went into the kitchen of the Corona and there was still several fires showing in the wall in different places and I kept putting them out and it kept coming back again.

Q. Now at this time that you are speaking of, you have told us the

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 29.

Albert
Dutton,
Examina-
tion.

continued.

places that you saw fire coming through the coal chutes on the stairway? A. Yes.

Q. That is in the back? A. Yes.

Q. In this elevator shaft? A. Yes.

Q. And in the kitchen. Is that the only place that you observed fire? A. After I came out of there I went down the shaft. I got a ladder and went down the shaft.

Q. You have told us about seeing fire there, but when you made your survey around the front you saw no fire there at all? A. No.

Q. Did you see any fire anywhere except in the back, such as you 10 have already told us of? A. No.

Q. And so far as you could tell was the fire at that time confined to the back of the premises? A. Yes.

Q. And what did you do to put the fire out that you have told us about, or the fires? A. Well turning the streams of water on them.

Q. How many streams did you have there? A. At that time there was two. They were laying the other one and when I came back the other pump had arrived then.

Q. And that would make three? A. Yes.

Q. And did you have more than that? A. Well later on they kept 20 filling up the outlets at the pumps as they came in.

Q. When you got there there were two and then you got another one and that made three? A. Yes.

Q. And with those three lines you were fighting the fire from the lane? A. Yes.

Q. And you started to tell us about the elevator shaft. Did you or your men go down that shaft with a hose? A. Yes.

Q. Did they fight the fire from there? A. Yes.

Q. Were they able to stay there? A. They stayed down there as long as they could because in front of the doors at the bottom of the 30 shaft the timbers in front of it in the ceiling fell down and blocked the doors.

Q. Up until that time they fought fire in this elevator shaft? A. Yes.

Q. Were any of your men in the basement after the fire? A. Oh yes, but I was not with those. The district chief was down with those.

Q. Did you know? A. I know they were down there, yes.

Q. The district chief. Who is he? A. Hargrove.

Q. Do you know of anybody else who was down there fighting 40 fire? A. Well I could not tell you the names of the men.

Q. Were they there for some time after? A. Well after I came back up the shaft I ordered another booster pump up.

Q. That is the second booster? A. Yes.

Q. You ordered one when you first got there and then you ordered another? A. Yes.

Q. And when that arrived? A. I told them to stand at the corner of 6th and Jasper and when they arrived, to put two lines from headquarters to two outlets and lay these two lines in front of the Corona Hotel and to leave them there until they could see there was not going to be any trouble in the front.

Q. At this time the fire was still confined to the back? A. Still at the back, yes.

Q. Were you able to get the fire under control? A. No, sir.

10 Q. It got the best of the department, did it? A. Well eventually I went back into the kitchen of the Corona and Mr. Templeman was with me, Tom Templeman, and near the urn in the kitchen in the partition there was a flame coming out of the partition about eighteen inches long and it had a whirling motion and I said to Templeman: "What is that?"

Q. You cannot give in evidence what you said to Templeman or what he said to you. But as a result of what you saw elsewhere what did you do if anything? A. At that time my men was on the Motor Car Supply roof. The fire had eventually—after that the timber fell down and she started to creep in towards the Motor Car Supply Company building.

20 Q. And where were some of your men? A. Some in the shaft. And I pulled them out of there and broke the panels out of the rear door of the Motor Car Supply Company and I sent a line on top of the roof of the Motor Car Supply and got them to take the skylights off and throw the water in there.

Q. They were fighting it from the top? A. Yes. And then I went into the partition and saw this flame coming out of the wall. It was not burning the wall at all but it had a whirling motion which denoted pressure and I went back then and pulled my men out of the basement and pulled them off the roof of the Motor Car Supply Company and I
30 told them to get out.

Q. You pulled them off the roof? A. Pulled them off the roof as well.

Q. Why did you do that? A. Because I anticipated another explosion.

Q. Was it a safety measure? A. Yes.

Q. You pulled them out of the basement? A. Yes, off the roof of the Motor Car Supply Company.

Q. And you thought they were in danger, did you? A. Yes.

40 Q. What in your opinion as far as you could tell was the reason why you could not get this fire under control? A. Because I am satisfied it was gas.

Q. Well you have told me the gas had been shut off? A. On the domestic line, yes.

Q. From the lane, that is the gas line leading into the premises?
A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence.

No. 29.

Albert
Dutton,
Examina-
tion.

continued.

Q. Did you have any talk with any official or employee of the gas company in regard to the situation? A. I asked Mr. Philpot: "Have you shut that gas off?" He says: "Yes." And I said: "There is some leaking in yet."

Q. Did you speak to anybody else outside of Philpot? A. Well Mr. Spencer came to me later on. That was after I pulled my men off and he said: "Will I get the air compressor?" And I said: "You had better get something, there is a leak somewhere." The air compressor is to break the pavement to get down to the main to see if there is a leak.

Q. You agreed that he should get the air compressor? A. Yes. 10

Q. And did they get the air compressor? A. Yes.

Q. And then began to search for the leak which you thought must exist? A. Yes.

Q. Now can you tell us why you came to the conclusion that gas was being fed into the premises where the fire was going on? A. Well it was burned in places around the brick walls and the pavement.

Q. Any other reason? Were you putting the fires out that you saw there? A. Oh yes, and they would come back again.

Q. Do you remember anything that happened after you had ordered your men off the roof and brought them up from the basement and so forth? A. There was an explosion happened about two minutes after I had called them off. 20

Q. And the result of that explosion was what? A. The east wall of the Corona fell out over the top of the Motor Car Supply roof and the rear wall leaned inwards. That is the south wall.

Q. Did it fall in? A. No but it leaned in for the time being.

Q. And the east wall? A. Blew out.

Q. It fell in or blew out? A. Yes.

Q. Was there any wind blowing that night? A. Yes, there was some blowing. 30

Q. From what direction? Do you remember? A. A kind of north-easterly direction.

Q. Well do you remember now? Did you make a report to the City Commissioners? A. Yes.

Q. Shortly after the fire? A. Yes.

Q. Have you got that report with you now? A. Yes.

Q. I would ask that the witness be permitted to refer to the report and refresh his memory.

THE COURT: I have not seen any difficulty with regard to his memory so far. 40

MR. FRIEDMAN: There were certain questions I want to put to this witness that I think it will be necessary for him to refer to the report to refresh his memory on.

THE COURT: If you are instructed as to the matters, well perhaps Mr. Smith won't object. You know the proper way to go about it.

MR. FRIEDMAN: I have a copy of the report before me which would indicate that the witness's memory now is different to what it was when he made the report. I would ask leave to ask the witness to refer to the report now in view of what he says in the report.

THE COURT: Well ask the preliminary questions which will permit you to do so.

MR. FRIEDMAN: You made a report to the Commissioners? A. 10 Yes.

Q. That report was in writing? A. It was typewritten.

Q. THE COURT: When was it made? A. On March 1st, 1932.

Q. By reference to that report do you think your memory would be assisted as to what actually happened or of what you observed at the time? A. Oh yes, my Lord.

Q. MR. FRIEDMAN: Will you look at that report and see if you made any reference to the question of the wind that night?

MR. SMITH: You have already ruled once on it, your Lordship, and I make the same objection I did this morning. He is not entitled 20 to look at anything except notes he made contemporaneously with the event and what is being referred to now is a report not only of things of personal knowledge but deductions and recommendations and conclusions of all sorts. I have been given a copy of it, and I do submit that he has already answered the questions with respect to wind and any lack of memory is not shown and I submit that he should not be allowed to consult his report.

THE COURT: You are tendering it to direct his attention to facts either of things observed or of what happened?

A. MR. FRIEDMAN: Yes.

Q. THE COURT: And at the moment you are directing your attention 30 to the direction of the wind that night?

MR. FRIEDMAN: Yes, sir.

THE COURT: All right.

MR. FRIEDMAN: Have you looked at your report? A. No, sir.

Q. Will you do so and see if you have any reference there to the question of how the wind was blowing that night? A. Yes.

THE COURT: And I suppose the next question is—

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 29.
Albert
Dutton,
Examina-
tion.

continued.

MR. FRIEDMAN: Have you found any reference in your report?
A. Yes and I want to correct myself on that. I remember now about the sparks blowing towards the north on to 7th Street where some sparks did drop on roofs and residences on 7th Street. It was a southerly wind.

Q. Did you stay at the fire for some time? A. Yes.

Q. Personally? A. Yes.

Q. During the night did you notice anything in connection with this fire that fixed your idea in regard to the question of whether or not it was a gas fire? A. Oh yes.

Q. Just tell us what those things were? A. Well after the collapse of the south wall there was a fire inside the south wall below the basement which could not be put out. As a matter of fact it was like a huge radiant and stayed there until the vent was put in by the gas company on the main down on 7th Street, and then it went out.

Q. Well when did it go out, do you know? A. Well I don't know. It might be around six or seven.

Q. But during the night this fire that looked like a radiant that was going— A. Going all the time.

Q. Were you playing water on it? A. Yes.

Q. What would happen? A. It would not make any difference.

Q. Well wouldn't the water put it out? A. No.

Q. And the result the building was pretty much a total loss, was it not? A. Yes.

Q. Did the gas company bring this air compressor? A. Yes.

Q. Do you know where? A. I saw them working along the lane towards 7th Street.

Q. You saw them working with it? A. Yes.

Q. But you did not know what they discovered? A. No.

CROSS-EXAMINATION BY MR. SMITH.

Q. I understood the first thing you said was that you noticed at the fire was the flames coming out of the ground about the centre of the lane and travelling towards the south wall of the hotel? A. Yes, sir.

Q. And perhaps you would indicate on a plan for me, referring to Exhibit 18, you observe the Corona Hotel is marked. That is the east and this is the west and there is the lane? A. It was right close to me.

Q. You were pointing to the place which is marked "F"? A. Yes, it would be around here some place.

Q. And you are indicating a point about the centre of the lane going in that direction that I have shown with the lead pencil mark which I will call "Y?" (Indicating with Y.)

Q. And that flame as I understood you is about eighteen inches high? A. Oh not in the lane; that was in the kitchen.

Q. How high was it? A. Oh it was different heights, a kind of ragged, I would say that the formation of the crack would cause that somewhere around four or six inches.

Q. But there was a continuous flame from the centre of the lane to the basement wall? A. As a matter of fact when they were trying to get down to the box to shut off the domestic line they had to keep flowing water on there to keep it out.

Q. And you say that that line of fire on the line marked "Y" was still there? A. Yes.

10 Q. And doesn't it strike you as a peculiar thing with the number of firemen who have given evidence here and Mr. Templeman who has given evidence, that you are the only person who has seen that piece of fire. Doesn't that strike you as peculiar at all? A. No, not at all.

Q. Not at all? A. There were many fires peculiar that night.

Q. But doesn't it strike you as peculiar that you are the only person as yet in this lawsuit of some six or seven or eight witnesses that has seen that particular line of fire? Does that strike you as peculiar? A. No.

20 Q. Why doesn't it? A. I had more opportunity to observe. Men on the ends of lines have not the same opportunity.

Q. And I suppose that fire continued there till the gas was shut off in the morning? A. Well I would not say continued in that particular place.

Q. Well how long did it continue in that particular place? A. Well I could not give you a definite answer on that.

Q. Well give me an idea. You said it continued for some time? A. It did not continue there after the building collapsed because all the gas then had a better opportunity to flow in there.

30 Q. But tell me how long it continued there to your knowledge? A. To my knowledge it continued there for half an hour.

Q. So that it would be visible to all the people walking around and about that lane? A. There would not be many walking around there at that time.

Q. Well a lawyer went down there, a man named White went along there, and told us about this fire. Do you know him—Mr. Ranald White? A. No, sir.

40 Q. So you have no other explanation to give me than that your men were so busy handling their hose that they would not notice this fire in the middle of the lane? A. Well they did at one time when they were trying to get to the box at the shut-off.

Q. Well who were they? A. Well I could not tell you.

Q. Well I will give you their names—Captain Williamson; Constable; Hobbs; District Chief Hargrove; Campbell; Browning; Lockie—they were the men who have been called here who were actually in that neighborhood. Are any of these the men who would see it? A.

Well they should have seen it. Of course they were there before I got there, and it may have been in a different place before I got there.

Q. I will tell you this, then, that so far as the evidence has gone in this case you are the only man who has mentioned fire burning in that lane except from the crack between the pavement and the wall itself.

MR. WOODS: That is not quite right. There is one witness whose impression was there was fire out from the wall in the lane about three or four feet. My memory of the evidence was it was not exactly at that point, but there was one witness who spoke about fire being two or three feet out in the lane, but I am in some doubt as to whether he had 10
localized it particularly.

MR. SMITH: One man said, not two or three feet but one foot to fifteen inches from the wall. And outside of that you are the only person who made that discovery. A. Well I am staying with my story.

Q. Oh no doubt you are and I am not blaming you for a moment. But as a matter of fact there was ice on that pavement that night? A. Yes.

Q. And yet you saw this fire for at least half an hour burning on that lane running directly toward the curb box of the gas company and up to the wall of the hotel? A. Yes. 20

Q. And you have given me all the explanations you can as to why—the possible explanations that you should have been the only person to have observed that phenomena? A. Yes, sir.

Q. THE COURT: Do I understand you to say it was in an unbroken line? A. Well it was not exactly as straight as this line here. It would depend on the formation of the crack in the pavement.

MR. SMITH: And after seeing that, as I took notes of what you said, the first alarm there was a booster pump, combination and the aerial ladder and service ladder truck—I take it that is ladders— A. Well manual ladders. 30

Q. And then you say there were flames in several places near the stairway. Who was it was fighting those flames? A. Well the first company that arrived on those fire trucks.

Q. We have learned from Williamson and Hobbs and later from Hargrove about their efforts with those flames there and I take it you can add nothing to the knowledge they have given us about those flames? A. No.

Q. And we will be quite prepared to accept the story they have told the Court about the action of the flames in that place? A. Yes.

Q. And you said there were flames near the elevator shaft? A. 40
Yes.

Q. Where did you see those from? A. Down the elevator shaft itself. The elevator was down and we saw the fire down there and we pulled the elevator up with a rope.

Q. And what I wanted to get was your first view of those flames in front of the elevator door. Was that your first view of them? A. Yes, sir.

10 Q. And then we know that Williamson and Campbell went down the elevator shaft and I understood you to tell Mr. Friedman, but I think perhaps you were mistaken and I want to give you a chance to correct it, when they went down they played water from there on those flames, I understood you to say? A. Yes.

Q. Campbell has sworn positively they put no water on those flames the first time they went down that shaft? A. Not the first time.

20 Q. He has sworn positively in this Court that they put no water whatever, that the minute they opened the door the flames came in over their head and they retreated, properly, and as quick as they could. Are you prepared to accept his word for that? A. No, sir, there was a line down there. The first time I went down there was no line. I went down to see if we could get into the basement and the second time I went down there was a line went down there with them and I was there with them myself.

Q. There was an occasion when District Chief Hargrove and I think three others went down but they say they did pour water, and do not be confused about those two occasions, but Campbell said the first time they were down there flames burst over their heads and they were confined in a six by six area and they got out as quickly as they could without putting water. Are you prepared to contradict that statement? A. The first time there was no water but the second time I was with them when the flames belched over their heads.

Q. Who were you with? A. Campbell and Williamson.

30 Q. And you deny what Campbell says and you said on this occasion you did put water on this fire? A. Yes.

Q. And neither Campbell or Williamson mentioned you being down at the time I am speaking about. You are sure you were down with these two men? A. Yes.

Q. And neither Campbell nor you are greatly mistaken as to what happened? A. I helped Campbell up the ladder when the flame belched over his head.

40 Q. But what I am saying is with respect to throwing water, playing the stream of water, either you or Campbell are greatly mistaken as to what took place at that time? A. Well it was some time ago.

Q. Well one of you is wrong about it? A. Yes.

Q. And you also spoke to Mr. Friedman that when you arrived at the fire two lines of hose were playing on the fire? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 29.

Albert
Dutton,
Cross-Ex-
amination
continued.

Q. That you went to the front of the hotel, went into the rotunda, then went into the Motor Car Supply Company and saw no indication of fire in there. You then went to the rear of the ground floor of the Motor Car Supply and no indication of fire there and none in the basement. You then went to the rear and saw Philpot and Templeman, you went then to the kitchen and saw fire in several places on the wall. Who was in the kitchen fighting those fires when you saw the fires on the wall in the kitchen? A. Well there was no one in the kitchen. I called them up from the basement.

Q. Who came up from the basement? A. Hargrove and Browning. 10

Q. So at the time Hargrove came up and fought the fire in the kitchen was when you called him from the basement? A. Yes.

Q. And Browning was with him? A. Yes.

Q. And Browning had an axe? A. Yes.

Q. And he is the man who opened holes in the wall? A. Yes.

MR. WOODS: According to my memory of the matter Mr. Smith or the witness is at cross purposes. It was some time later when Mr. Browning took his axe to the south kitchen wall but I think my friend will remember. And Hargrove came back some time later and speaks of seeing fire at the coffee urn, and Mr. Dutton appears to have called him 20 up to fight the fire at the coffee urn. It was some time later.

MR. SMITH: I merely asked if he called Hargrove and Browning up and he said he did not. Was that the occasion on which you saw the revolving flame? A. No, it was a later occasion.

Q. And you also told Mr. Friedman in answer to the question if your men were fighting fire in the basement and you said they were? A. Yes.

Q. The evidence in this Court is that except at a later period when Deputy Chief McGregor and Kinsman walked from the back clear up to the boilers and returned again, with the exception of that we have not 30 heard of one single fireman except by way of the elevator shaft who set foot on that basement floor? A. They went in too far. They were taking too much risk.

Q. Who did? A. McGregor or whoever was with them, when the gas was flowing in.

Q. I am not speaking—with the exception of those two men Deputy Chief Hargrove and Mr. Kinsman?

MR. FRIEDMAN: And Mr. Manson.

MR. SMITH: I am saying that so far as the evidence yet discloses no fireman was off the bottom step. I am not criticising you. I merely 40 want the facts. Is that your understanding of the situation? A. Yes.

Q. And with the exception of what Hargrove, Kinsman and Manson did, it is very plain to you of course—you know of course that the most severe fire and that one which subsequently burned out the roof above it was that over the elevator shaft. This is the line and we are looking north up the basement? A. Yes.

Q. And that line which you see there is a partition going to the ceiling. So that it is plain that from the stairway they could not put water in there? A. No, not from there.

10 Q. And that is the reason the effort was made from the elevator shaft? A. Yes.

Q. And it is also equally plain that by leaving these stairs a bit they could have put water into the fire from the front. They could not go any further back into the lane but forward where it might be expected to advance? A. Oh yes, if there is fire there.

Q. We have been told that the severe fire was over here by the elevator doorway? A. Yes.

Q. And they had to go off these steps a bit to put water in the fire where the source of the fire was? A. Yes.

20 Q. So far as you know, no one went into the basement and put water there and either at the front? A. You mean the boilers?

Q. No, the fire in the southeast corner of the basement by the elevator shaft. I say no one so far as you know went into this basement and played water back? A. No, not as far as I know. They were fighting it here.

Q. They were fighting it from the elevator shaft and from above? A. Yes.

Q. And when you got there this fire was confined to a comparatively small area, that is true, is it not? A. Yes.

30 Q. And your explanation is it was because the fire was fed with gas that it got away from you? A. Yes.

Q. And what I am saying is, there is no doubt in your mind that had that fire been fought from the basement floor as it was advancing north, if it had not been a gas fire it could have been put out? A. It could have been put out.

Q. There is no doubt about that? A. There is no doubt about that.

Q. So we come to this position, that that fire, had it not been a gas fire, could have been controlled by fighting it from the front? A. Yes, sir.

40 Q. So that we then have this comparatively simple problem—is it or is it not possible, having localized the fire being fed by gas to put that fire out? A. Not unless you can shut the flow off.

Q. Granted you cannot shut the flow off immediately? A. Yes.

Q. That seems to be the problem? A. Yes.

Q. Are you of the opinion that because you have gas feeding into the building that that building is doomed and it is impossible to put it out? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence.

No. 29.
Albert
Dutton,
Cross-Ex-
amination
continued.

Q. You will go that whole distance? A. Yes I will go that whole distance.

Q. And you came back into the kitchen with, I think, Mr. Tom Templeman? A. Yes.

Q. And you saw the flame coming out of the wall by the coffee urn, which was a whirling flame? A. Yes, sir.

Q. We have had a number of people—Hargrove—who saw a flame in that vicinity—Mr. Browning. Well that is two, anyway, saw a flame in that neighborhood and you have no doubt they saw the same flame you did? A. I can't swear to that. 10

Q. Well it was behind the coffee urn and the only ones we have heard about there? A. It might have been the same flame.

Q. It might have been put out and come on again; but a flame in the same position? A. Yes.

Q. And you say that was whirling? A. Yes.

Q. Perhaps you could explain that for me a little better. In what direction was it whirling? A. Well it was spinning towards the base of the flame and the end was white, but coming out of the partition it was spinning. 20

Q. You mean the head was coming out? A. Oh no. It was straight out from the wall and turning.

Q. Turning horizontally? A. Yes.

Q. And how long was it? A. Oh I would say about eighteen inches.

Q. And you thought that indicated pressure? A. Yes, sir.

Q. And there is no doubt that if that was a natural gas flame—
A. There is no doubt in my mind.

Q. There is no doubt whatever that that flame that you saw had pressure behind it? A. Yes.

Q. And how thick through was it? A. Oh I would say the base of the flame was about an inch and a half. The hole that was in the partition was about an inch and a half across. 30

Q. So we have an inch and a half orifice, a flame an inch and a half across at the base? A. Yes and spread out as you get towards the end.

Q. It did not go to a tip at the far end? A. No.

Q. And this flame coming out of an inch and a half orifice extended eighteen inches from the wall? A. Yes.

Q. And was thicker at the tip than at the base? A. Yes.

Q. And how much thicker? A. Oh it spread out about four inches.

Q. We have an eighteen inch flame spreading out about four inches. 40
In other words, it would look like a mildly receding funnel? A. Yes.

Q. It also follows at that point in that wall if that was natural gas there must have been enough pressure to produce the result you have described. That is right? A. Yes.

Q. And if there was not enough pressure at that point to produce the result you have described you will have to describe it as something

other than a natural gas flame, won't you? That seems to follow?
A. Well I say natural gas because the partition was not burned itself.

Q. Well the thing that burns is always the gas, no matter what you see, whether coal, cinders or garbage? A. Yes.

Q. And I say if this is an impossibility under those circumstances to have enough pressure concentrated behind that flame to give it its length and its behaviour and its width, then it could not be natural gas, if it was impossible to have that much natural gas pressure there. You will agree with me I think? A. I do not think I have that clear yet.

10 Q. Well I think it is so obvious I won't bother any more. Now that is the only place, if I listened to your evidence correctly, that is the only place you saw pressure, obviously behind any flame, isn't it? A. Yes.

Q. All the other flames you saw were of the lazy type? A. Yes.

Q. So that there is no question and I would like—and I am showing you Exhibit 14, which you will see is a plan of the—this is the lane and this portion is marked the kitchen. And there are the coffee urns there?

A. Yes.

Q. On the northeasterly corner of the kitchen. Now you see that little mark there and one on each side of that partition? A. Yes.

20 Q. Would that be the place where you saw this flame coming out?

A. It was just on the side. There were two urns, and it was not right behind them, it was on the side of the southerly one.

Q. I suppose you cannot tell whether those dots actually represent the place or not? A. No.

Q. Did you see flames in the neighborhood of this yourself at any other place or just the one place? A. Not at that time. That was the last time I went into the kitchen. When I saw that I beat it out into the lane and called my men off.

30 Q. And you were alone? A. No, Mr. Tom Templeman was with me at that time.

Q. And you told us at the front elevator the second time the men went down, the doors were blocked by timber falling from above?

A. Yes.

Q. You told Mr. Friedman that, did you? A. Yes.

Q. Now just to clear it up quickly. I imagine that was your reasoning. You did not see that. You did not see that timber fall down there?

A. Yes, sir.

Q. Where were you when you saw it? A. I was down at the elevator shaft.

40 Q. And were you down there more than once? A. Yes I was down there twice.

Q. Did it fall at the time? A. No, the last time.

Q. And it was a timber. It was not steel or iron? A. No.

Q. It was not steel or iron? A. No I do not think there was very much iron in that building.

Q. I think you and I can agree. Aside from gas, it sort of invited fire, didn't it? A. And how.

Q. In other words, it was rather old? A. Yes.

Q. And very inflammable—the whole show? A. Yes.

Q. Now this explosion that took place was in the Motor Car Supply Company, wasn't it? A. No, I do not know. I believe I put that in my report but I believe that is wrong.

Q. But on the 1st day of March you said it was in the Motor Car Supply Company? A. Yes.

THE COURT: Is that the first document you referred to to refresh 10 your memory? A. Yes.

MR. SMITH: You have a copy in your pocket? A. Yes.

Q. Look at the upper part of page 2 and you will find this: "At 10:27 p.m. I ordered the general alarm * * * * * No. 6 responded with another booster pump which was at 11:02 p.m. * * * * * as I anticipated an explosion would take place within the building.

THE COURT: Let me suggest to you that the Court Reporter has a copy of this. I doubt even if Mr. Powell can take down what you are reading now at the rate you are reading it.

MR. SMITH: (Reading): "At 10:27 p.m. I ordered a general alarm 20 which brought No. 7 with another combination and as soon as sufficient off-shift men had reported No. 6 responded with another booster pump which was at 11:02 p.m., as I anticipated an explosion would take place within the building." You then go on: "A few minutes after their arrival a violent explosion took place in the premises of the Motor Car Supply Company's building which blew out the east wall of the building behind the Kirkpatrick Building and caused the south wall of the hotel building to fall inwards."

THE COURT: Now I suppose, to make it quite accurate, you will ask whether he did report that? 30

MR. SMITH: What I have read to you—is that read correctly from your report to the City Commissioners on the 1st day of March? A. Yes. "Blew out the east wall of the building,"—That was the east wall of the Corona Hotel.

Q. MR. SMITH: In other words your suggestion now is that on the 1st day of March you reported the east wall of the Motor Supply had blown out, that that is an error and it was the dividing wall between the Corona and the Motor Car Supply? A. Yes.

Q. Now we know that over the Motor Car Supply are the rooms of the Corona Hotel? A. Yes. 40

Q. Now what wall blew out? A. That wall of the Corona Hotel.

Q. Now let us get this straight because I do not want you to get yourself into trouble unnecessarily. Down below, the Motor Car Supply Company's premises are only one floor in height? A. Yes.

Q. And there is a wall between there and the Corona Hotel. Above both of these first floors are the rooms of the Corona Hotel. So that you told Mr. Friedman that the wall of the Corona Hotel blew out on the top of the Motor Car Supply Company? A. Yes.

Q. It is an impossibility? A. No.

10 Q. Why not? A. Well it is as far as the one story, but the wall goes to where the Rex Cafe was and just part of that wall blew out.

Q. Was it the east wall of this whole structure which we know as the Corona Hotel that blew out? A. Yes.

Q. And is there another store to the east of the Motor Car Supply in that building? A. Yes.

Q. A restaurant is it? A. Yes, the Rex Cafe.

Q. I think perhaps you are making a mistake. I think the Motor Car Supply is the most easterly occupation of the Corona Hotel. So that was the wall which blew out. It was the wall of the Motor Car Supply Company? A. No, sir.

20 Q. Well it was not the wall of the Kirkpatrick Building because that is where the Rex Cafe is? A. Yes.

Q. Well I will ask you to look at the plan in front of you. I want you to tell me in your own way what wall blew out after that explosion? A. That would be the wall (indicating).

30 THE COURT: Let me direct your attention to this. You have already referred to the report that you made on the 1st of March, a few days after the fire, for the purpose of refreshing your memory, to alter it to suit what everybody now seems to think was a fact with regard to the wind. Now you are making a correction in rather an important matter of explaining that that report which you previously used to refresh your memory is inaccurate. Now if I may be permitted to do it I would like you to tell me from now, in what respect you say it was inaccurate as to the locality of the explosion referred to? A. It was not the Motor Car Supply.

Q. You say it was inaccurate? A. It is not the Motor Car Supply I referred to.

Q. You should have referred to what? A. The wall above the Motor Car Supply—the one story portion.

40 Q. MR. SMITH: And that is your best explanation of this. I am going to ask you again why you made this statement on the 1st of March: "A few minutes after their arrival a violent explosion took place in the premises of the Motor Car Supply Company's building." Now you have your report in front of you on the top of page two, sixth line from

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence.

No. 29.
Albert
Dutton,
Cross-Ex-
amination
continued.

the top: "A few minutes after their arrival a violent explosion took place in the premises of the Motor Car Supply Company's building." Now is that an incorrect statement? A. Yes, sir.

Q. Then how do you account for the fact that you said it was in the Motor Car Supply Company's building when you thought it was in some other building? A. That was an error in the typing of the report out.

Q. Oh, you are not going to blame that on a stenographer, are you, surely? What I meant to say, chief—

THE COURT: Do you intend to suggest it was an error in the type- 10
writing of the report? A. No I do not.

Q. MR. SMITH: And you have no explanation to give me of that except to say that it is an error? A. Yes.

Q. And how do you account for such an error? A. Well I don't know.

Q. Well didn't the east wall of this Corona Building fall down? A. It was the east wall above the Motor Car Supply with the one storey roof where I pulled the men off there. It was the wall next to that.

Q. Well I cannot give you any further assistance and I will leave off.

THE COURT: What wall do you mean? A. The wall next to the 20
Motor Car Supply Company, the one storey portion of the Motor Car Supply Company in the rear, and the wall next to that.

Q. Which way? A. West.

Q. MR. SMITH: I am anxious to tie this time up and I hope there is no mistake there. You say, reading back to where I began: "At 10:27 p.m. I ordered a general alarm which brought No. 7 with another combination and as soon as sufficient off-shift men had reported, No. 6 responded with another booster pump which was at 11:02 p.m. as I anticipated an explosion would take place within the building." Now that 11:02 p.m. gives you the time that you brought your men out of the 30
basement, doesn't it? A. That 11:02 p.m. is the time the operator gets. Possibly there might be five minutes delay in getting it through there.

Q. You said you pulled them out of the basement two or three minutes before the explosion took place? A. Yes.

Q. And you say a few minutes after their arrival a violent explosion took place and it will be in the neighborhood of 11:00 o'clock that you anticipating an explosion ordered these men out of the basement and off the roof? A. Yes, sir.

Q. And you still are of the opinion. Where were these men in the basement at 11:00 o'clock? A. I was down in the stairway. 40

Q. And who were these men? A. I cannot tell you. I did not go down to see them. I just ordered them to come out.

Q. You don't remember who they were? A. No.

Q. You were in the rotunda of the hotel during the progress of the fire and I want to ask you this question, if you assured some of the guests? A. Oh I never saw any of the guests at all. They were all cleared out when I went into the rear of the hotel first.

Q. A guest I have in mind is Mr. Scott. I am going to ask you if during that evening in the rotunda of the hotel you saw a guest of the hotel named Scott and informed him not to take his things from his room, that there was no danger? A. No, sir, not me.

10 Q. Then perhaps I may put it generally. Did you on that evening tell any person—any of the guests of the hotel—not to be disturbed and not to take their things out because there was no danger? I am not trying to use the exact words, but there was no occasion for them leaving? A. No, sir.

Q. You did nothing of that kind? A. No, sir.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 29.
Albert
Dutton,
Cross-Ex-
amination
continued.

No. 30.

Evidence of John McGaffin,

No. 30.
John
McGaffin,
Examina-
tion.

JOHN MCGAFFIN, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and
20 testified:

Q. What is your present position in the City's employment?
A. Superintendent of the Exhibition Grounds and Buildings.

Q. And in 1923, in August and September, when the Gas Company were in the course of laying their mains along 107th Street what position did you occupy in the City's service? A. Foreman for the City Engineer's Department.

Q. And were you in charge or had you to do with the repairing of the streets of the City or the pavements of the streets of the City after they had been cut by the gas company in the course of putting in their
30 mains across the streets? A. Yes, sir.

Q. And had you to do with that in connection with the crossing of 107th Street by the pipe along the lane south of Jasper where it crossed over 107th Street? A. Yes, sir.

Q. Was the lane south of Jasper paved at that time up to the street?
A. No, sir.

Q. But 107th Street was paved? A. Yes.

Q. Now will you describe to the Court what repairs were made to that pavement as a result of the laying of the gas pipe across 107th Street? A. Well first the cuts were dug out on the street and then the
40 tunnel between each cut.

Q. What cuts? A. There are three cuts.

Q. Describe them please? A. One towards the approach from the lane and one in the centre.

Q. There were three cuts, one on the east side of the street just at the line where the lane meets the street? A. Yes, sir.

Q. One at the west side of 107th Street where the lane meets the street at that point? A. Yes.

Q. And a cut in the centre of the street? A. Yes.

Q. And the pavement was not cut in any other places than that? A. No, sir.

Q. Now can you remember how big these cuts were? A. Well I could not say. It is a long time since. I could not remember that exactly.

Q. You could not give us any approximate idea? A. No I could not be accurate at all. 10

Q. Now can you tell us how the gas main—the intermediate gas main—which was laid across there as we have it in evidence in August 1923, how the gas company laid that main across or under the pavement on 107th Street—by what method? A. No I could not tell you the method they used in laying that one. It was laid before I got there.

Q. But whatever method was used it was laid in a method which did not call for the cutting of the pavement in 107th Street except at three points A. Yes, sir.

Q. That is right? A. Yes, sir. 20

Q. And were you yourself there on the ground at any time during the time when the City was repairing these cuts, that is, I suppose repaving them—you would pave them over again? A. Yes.

Q. You would put asphalt pavement over the places that had been cut? A. Yes.

Q. Were you there yourself when that was done at any time? A. Yes.

Q. What did you find as to whether there was anything that specially impressed itself on your memory with regard to any of the cuts at that time? A. Well I found lots of cuts at that time. There was absolutely no backfilling done at all. The cuts would be filled in and whatever tapered down each way would be all the filling— 30

MR. SMITH: I don't know, I don't think this is evidence. Even if you find the particular place I question whether it would be—dependent upon what stage the work was in. I do not think it is evidence.

THE COURT: I understood Mr. Woods' question to be limited to the area in which he had been asking the witness and the witness misunderstood him and was travelling far afield. I thought of stopping him but I expected Mr. Woods would.

MR. WOODS: I thought he was answering me with regard to the particular place. 40

Q. Remember, we are confining our attention in this inquiry for the time being to the place where the twelve inch intermediate pressure line

was laid across 107th Street, these three openings that you found. Now did you find anything there with regard to the backfilling at that time?

A. Yes. They were not backfilled in the centre between each cut.

Q. And did you notice anything—was there any circumstance that happened there about the gas? A. Yes, we had a leak there when we first started to dig one of the cuts out.

Q. You had a leak of what? A. Gas.

Q. And what did you do? A. I went up to the Gas Company and notified them.

10 Q. Which hole was that? A. The hole on the east side.

Q. The hole on the east side of 107th Street? A. Yes.

Q. And you were with one of your men, were you? A. No, I was at 5th Street when I was notified about it and I went down and saw it and then went to the gas company myself.

Q. Was the gas burning when you got to 107th Street? A. Yes.

Q. At that leak at that corner? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence.

No. 30.
John
McGaffin,
Examina-
tion.

continued.

CROSS-EXAMINATION BY MR. SMITH.

Cross-Ex-
amination

Q. You notified the Gas Company of this leak? A. Yes.

Q. And they repaired it? A. Yes.

20 Q. That would be at the east end of the hole? A. Yes.

Q. And I suppose it was a dresser coupling of some sort? A. Well I could not remember that.

Q. Do you remember the date you notified the company of this leak so we could look it up? A. No I couldn't tell you.

Q. You can't tell me within a minute? A. Well it was in the fall, perhaps the month of September.

Q. And you say there were these three openings across the road. Do you know Assistant City Engineer Gibb? A. Yes.

30 Q. And he was at that time inspecting the contractors who were doing the work? A. Yes, sir.

Q. And will you agree with me that when you speak of holes in the road in 107th Street, they were holes fifteen to twenty feet in length? A. Well I could not say just what length they were.

Q. This is my point. We speak of three holes. The Court might get the idea we just had a little round hole. They were substantial cuts across the pavement? A. Yes, perhaps the length of that table.

Q. And they were cuts of a nature so that having taken it out and gone down to the top they were of the nature that with long shovels one could do the trenching? A. Well you could not reach it with long shovels.

40 Q. If they were fifteen feet long, these cuts, you could work from both ends? A. No.

Q. Well three cuts of fifteen feet each would be forty-five feet? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 30.

John
McGaffin,
Cross-Ex-
amination
continued.

Q. Leaving thirty-five feet? A. Yes.

Q. The cuts were all made in the pavement itself? A. Yes.

Q. And inside the curb? A. Well now I could not say whether it was inside the curb.

Q. Well your sidewalk? A. No, there is a portion of your street comes back and goes back on the property line.

Q. Well perhaps you will say you do not remember whether they were inside the curb or not? A. I don't remember exactly the spot they were located in.

Q. But you say when you were there making your pavement re- 10
pairs the backfilling had not been properly done? A. Yes, sir.

Q. And I suppose there is not the least doubt, that you, being in charge of that gang backfilled the pipes as well as you could? A. Well the best we could do under the circumstances.

Q. So when you left these pipes were in perfect condition? A. Yes as far as we could.

Re-Exam-
ination

RE-EXAMINATION BY MR. WOODS.

Q. Was it part of your duty in fixing up the pavement cuts to do any backfilling for the company? A. Not at first. The understanding was all I had to do was to concrete the cuts and asphalt them, but they 20
found the material was going away at the end and naturally we investigated and found they were not backfilled. I notified the foreman and he took it up with the engineer's department and they told me to go ahead and backfill.

Q. And were you backfilling enough to make your pavement repair? Was that the purpose of the backfilling you did? A. Well what we started out to do in the first place was get out the cuts. They had been filled up with dirt and we dug them out, six inches of concrete and two of asphalt, and we found the backfilling was not done.

Q. To what extent did you do backfilling at that time? A. Well 30
everything we found that was not backfilled we backfilled it.

Q. That is in connection with the gas company's main? A. Yes.

No. 31.

Evidence of William Ruff.

No. 31.
William
Ruff,
Examina-
tion.

WILLIAM RUFF, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. What position do you occupy in the City service? A. Sewer foreman.

Q. And you went to the Corona Hotel building on the Monday morning following the fire? A. I will say yes. I am not certain whether it was Monday morning or any other morning.

Q. But it was the morning following the fire? A. Yes.

Q. At what time? A. Probably at ten o'clock, somewhere around there.

10 Q. And the gas company men were endeavoring to locate a gas leak in the centre of the street at the time you got there? A. I think at the time I got there they were working on the hole on the west side of the street.

Q. And they started in the centre? A. Yes.

Q. And we have it they found a leak in the one in the centre. Now we will take up this matter of the smoke test. I said I would take it up with you and we will see what your memory of the smoke test is. It was made under your direction? A. Yes.

Q. It was the test Mr. Templeman has given evidence about here of his taking his smoke machine and putting it in the hole where the vent pipe of the gas company had been? A. Correct.

20 Q. And were you here when he was giving his testimony? A. No, I was not.

Q. I will give you a resume of it as near as I can remember and my friend will correct me if I make any error. He said he put his smoke machine in there first of all at the hole where the vent pipe was? A. Yes.

Q. And he says he put it in in the street railway return cable conduit box? A. Yes, that is correct.

30 Q. And after having plugged the hole at the hole opposite the next hole, to see that the conduit box was clear he then took out his plug and put smoke through the conduit box from that vent pipe hole; and he says that smoke came out of the conduit box at a point that was dug by the City employees a little further to the east, at a point which he has marked—this is the original point—which he has marked "D" on the plan? A. Yes.

40 Q. And he says, as I remember it, that smoke escaped from the box at that point; that he then moved his smoke machine to that hole and pursued the same operation, the same movements, with regard to the hole still further east, just at a point "F" and it was where the gas company had opened the pavement at the lane to put down at the time they were searching to turn off the gas the night of the fire, and found the same thing happened there and then he moved his smoke machine to that point, still going eastward, and forced his smoke through the smoke machine in the same way to the point "E" as marked on the plan where the city had dug a hole, and that the smoke emerged during the course of the smoke in that journey at the point where the coal chute marked "G" is

and went into the basement of the Corona Hotel building as it then was. Of course the walls were down by that time.

MR. SMITH: I do not think you are quoting Mr. Templeman right. It was Mr. Booth gave the information about the coal chute. Mr. Templeman said all he could see was the smoke going through a wall in the Corona Hotel building.

MR. WOODS: My memory is—did not Mr. Templeman state just at the end of last night when Mr. Milner was talking to him that it went right into the hotel building?

MR. SMITH: Yes, through a hole in the wall. 10

MR. WOODS: And he was referring to that hole in the wall where the point "G" is as I remember?

THE COURT: Perhaps we might get an even better idea if we were to take this witness over it all again. There is always the difficulty in attempting to re-state what somebody else said.

MR. WOODS: Well I do not want the same evidence to be given. But I wanted to shorten it.

THE COURT: Well, do it your own way.

Q. MR. WOODS: That is what Templeman said. Is that a fair ac- 20
count as you observed of that smoke test? A. Well I will give you actually what happened if I am permitted to do so.

Q. All right go along. A. Some time the latter part of February, Mr. Haddow, the City Engineer instructed me to make a smoke test on the return box of the street railway conduit. If I remember correctly it was probably some time on a Thursday when we started to work there with compressors. On Friday we had all the holes down and the box was exposed and available for putting the smoke test in. We got Mr. Templeman with his smoke box. We did not use the gas company hole on 107th Street and the one immediately at the east side of 107th Street as they 30
already had a vent there which we knew the gas had travelled through that far. Mr. Templeman put his smoke box in that hole which I will call No. 3. He plugged that hole and then pumped the bellows which he has on the machine and the smoke came through to No. 4 inside the box.

Q. Now let me see if I understand you correctly. When you speak of plugging that hole, what did he actually do and where did he do it? A. He inserted to the best of my knowledge a flexible pipe inside the street railway return from his smoke box and then he plugged that box solid with mud inside the box.

Q. But at what point? A. At that point, at the east side of 107th 40
Street.

Q. But the plugging was done so the smoke would not go back westward? A. Yes.

Q. The object being smoke was diverted down the box eastward? A. Yes.

Q. Now go on? A. I was on the other end and smoke was observed coming out of the hole which I will call No. 4 on the west side of the Corona Hotel. On that box being plugged at that point there was no smoke observed coming on the outside of the box. After we had proven that the smoke had travelled through the open box I plugged the box
10 itself tight to see whether there was any smoke coming on the outside of the box to see whether there was any leakage in the box itself.

Q. The whole box was exposed at this time? A. No only two feet of it, a small portion, something like that.

Q. You are going from this point here to this point No. 4? A. Yes.

Q. And that is that distance. Now after you had demonstrated that the smoke would reach there then you say you plugged the box at that point No. 4 and having plugged it then he started to blow his smoke again? A. Yes.

Q. And he did that in order to see whether any smoke would come
20 out of the box itself during the course of its journey there? A. Yes.

Q. Well was the box completely covered or were there portions of it exposed? A. No, it was completely covered. It was in a frost casing.

Q. What I am anxious to find out is how could you tell whether any smoke came up outside the box by that test? A. It would come between the earth and the box.

Q. This is a paved lane. This is under the pavement? A. Granted.

Q. And suppose that smoke got outside the box that you had plugged at point 4 how would you know it had got outside the box? A. For the simple reason that it would show in the hole. The box itself was plugged
30 tight so no smoke would get through.

Q. The box was plugged tight at the west side of the hole? A. Yes.

Q. Not at the east side? A. Not at the east side.

Q. And you could not get any smoke through the box into the hole? A. No.

Q. But if any smoke came out of the box itself it would show in the hole? A. Yes.

Q. Go on. A. At that point we had proven there was no smoke coming outside the box, that is No. 4. Mr. Templeman then came to that hole, followed the same procedure by inserting the hose to the east side
40 of that hole and plugging it and I went to hole No. 5.

Q. Will No. 5 correspond to the one marked "F" on that plan? A. Yes. That was at the gas company shut-off. We enlarged that hole to make our test. We proved that smoke would travel through the open box in the same manner as the other and then we plugged the box on the west side.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 31.
William
Ruff,
Examina-
tion.
continued.

Q. Again? A. At this point it showed that the smoke came outside the box.

Q. And having plugged the box at the west side of the point "F" you then continued the smoke test and the smoke came through the box and up at that point "F" showing it was escaping outside the box between those two points at some point of its journey? A. Yes.

Q. And what next? A. We followed the same procedure between five and six on the east side of the Corona Hotel.

Q. From point "F" on that plan that we have, Exhibit 18, to point "E" on that plan on the east side of the Corona Hotel. And what experience did you have in connection with the escape of smoke from that box in the course of that portion of the experiment? A. The same thing happened at that point. 10

Q. Just tell me what did happen? A. Well the smoke travelled between five and six to the open box. Then we plugged the box to the west and the smoke came on the outside of the box into the hole.

Q. Did you notice any smoke coming out of the box at the point marked "G" at the coal chute? A. No, sir.

Q. Eh? A. No, sir.

Q. Were you in a position to notice any? A. I think at that particular time Mr. Gosling, Mr. Ward and Mr. Booth were down in the basement. 20

Q. So they would not see this? A. They were down there to observe if any smoke came out of the wall or out of the coal chute.

Q. They were down there in order to see whether any of this smoke came through the walls? A. Yes. I think I am correct in stating I was on the lane.

Q. You were not in a position to make the same observations as they were? A. And when they got the information they required I immediately pulled Mr. Templeman out of the hole so there was no more smoke went down there. 30

Q. You were at the hole at the point "E" while they were in the basement? A. Yes.

Q. They were looking to see whether the smoke travelled into the basement? A. Correct.

Q. You were looking to see what happened at point "E." That is right. Now can you tell us, Mr. Ruff, anything about the time — if you cannot, we cannot get it from you—when Mr. Booth—Mr. Booth has told us about seeing smoke coming into the basement. Can you tell us anything about the time when he saw that? We would like to know if you know it. A. I do not know the correct time.

Q. If you know whether that smoke Booth saw in the basement came into the basement at a time when the west side of the pipe was plugged at point "E" or whether it was when the smoke was proceeding without being plugged at point "E?" A. No it would be after the 40

box was plugged at point "E."

Q. Why do you say that? A. Well naturally we would plug the box at "E" to see whether the smoke would travel into the basement. There was no pressure behind the smoke.

Q. There was no pressure behind the smoke? A. No pressure, practically none at all. That is the information I received from Mr. Templeman.

Q. And in order to test whether the smoke would go out of the box and would percolate the basement at all you had to plug the box in order to do that. Is that right? A. Yes, correct.

Q. And that is what you say you have no doubt happened? A. No doubt at all.

Q. Now can you give us any information—I am on another matter now—as to the character of the ground underneath that pavement on the lane back of 107th Street at the back of Jasper Avenue, the lane we are talking about—the character of the ground underneath there, in February, 1932? A. Well on observation the ground from 3 to 4 was frozen solid of brown clay.

Q. From 3 to 4 what? A. The holes I called No. 3 and No. 4.

Q. MR. SMITH: Would not it be a good idea to have him mark them with his own numbers?

MR. WOODS: Yes.

Q. Now the character of the ground between 3 and 4 on Exhibit 18 was what? A. Frozen.

Q. Frozen brown clay. How far down? A. Well we put down hole No. 2 which would be somewhere about here to prove the depth of the frost.

Q. It was put down in the street? A. We put it down to prove the ground over the top of our sewer and we found six feet eight inches of frost at that point.

Q. And you say that between 3 and 4, what about— A. Between 3 and 4 was frozen solid, and was brown clay. Along the Corona Hotel building from 4 to 6, I am speaking of the ground between the wooden box and the hotel itself. When that basement had been dug it had been dug over-size. There was a cavity in between the brick work and the original ground. That was filled probably by material that had dropped off during construction and rubble and clay.

Q. How big would that cavity be? A. There was no actual cavity there but the backfilling was not solid. It was of a very porous nature.

Q. Between the wall of the building and the north side of what we call the conduit box? A. Well I would not say actually to the box, in the vicinity of the box.

Q. Of a very porous nature? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 31.

William
Ruff,
Examina-
tion.

continued.

Q. Consisting of material that had fallen off during construction of the building? A. Yes, broken brick and pieces of wood.

Q. And such like? A. Yes.

Q. And that extended all the way along there? A. I am only quoting now at the holes we opened.

Q. That is your actual observation at the places where you opened holes? A. Yes that is 4, 5 and 6.

Q. Now have you got from that observation any other knowledge as it comes to you in your capacity as a foreman of the kind—of the character—of the ground there? A. How do you mean? 10

Q. Do you know otherwise than by reason of your observation at those holes? Have you ever worked in that lane or seen work going on during paving or sewer construction that would give you any knowledge outside of that? A. Only at the time the Gas Company exposed their pipe and when they took out their pipe. You are speaking of the nature of the original ground?

Q. Yes the nature of the ground behind the hotel. I want to know whether it was porous or not or whether gas would escape through it? A. The original ground is not porous, certainly.

Q. But I am speaking of the ground behind the hotel as you describe it. It was porous at these boxes? A. Yes where we opened up it was very porous. 20

Q. And would that be, have you any information for us as to whether your experience would show that that wood would be in the same condition that the ground would be in along the whole back part of the hotel? A. Well possibly that information will come later. I do not know.

Q. Now we will go to another subject. You have a considerable amount of experience in the laying of sewers? A. Yes, sir.

Q. And of backfilling of sewer construction? A. Yes, sir.

Q. And you did take some pains I gather to ascertain whether there was any subsidence in the ground as a result of your having built this manhole "A" which has been in evidence, did you? Did you conduct any experiments in that regard? A. I think other men that were down and made that— 30

Q. I thought you were there too? A. I think it is Mr. Underwood.

THE COURT: I suppose that this is one of the points you referred to that I might speak of as anticipatory?

MR. WOODS: Yes.

Q. You did make an inspection of the rear wall of that basement of the Corona Hotel in the month of May after the fire, or so much of it as was left? A. I will not say I made an inspection. I was there. 40

Q. And did you observe this line of the backfilling that you told us about extending that wall up to the box at that time? A. I could not answer that truthfully and say yes. I may have done.

Q. But you do not now remember? A. I don't remember correctly.

Q. I would like you to search your memory about that, as to whether you could notice a clear cut face of the place where the solid earth had stopped? A. I have some recollection of it but I could not, as I say, answer you truthfully. One of my men by the name of Francis went there on one day, I could not say what day or date, and gathered four sacks of material from along that wall.

Q. Well have you got that material? A. Yes.

Q. That is all you did—was to gather the material? A. Yes.

10 Q. Have you got that material here? A. No, sir. It is outside.

Q. And is Francis here? A. No.

Q. Will you ask Mr. Francis to come tomorrow to identify that?
A. Yes, sir.

MR. SMITH: If my friend wants to use this with the witness he is at liberty.

MR. WOODS: I wanted to save time and expense. I have no doubt Mr. Francis made a report to Mr. Ruff about it and if my friend will take the witness's word—

MR. SMITH: Well I would like to see the reports. I would like to
20 ask the person who got the material as to who else might be there. I have no doubt he got the material.

MR. WOODS: We will have Francis here.

THE COURT: Yes, it is asking a great deal to ask you to admit it.

MR. WOODS: Now let us go to the only other point that it seems to me that I desire to have you give information about.

THE COURT: Perhaps you might like an early adjournment to-night?

MR. WOODS: Oh no. I have to jump from point to point. Did you
30 dig in the hole on 107th Street in order to ascertain whether there was any subsidence of the ground immediately under the pavement? A. Yes.

Q. Where was that hole dug? A. Well I could not give it to you in feet and inches, but it was in relation to the connection between the manhole in the centre of the street and the storm sewer.

Q. The manhole is in the centre of the street just about opposite to the lane? A. Yes.

Q. And the storm sewer is where? A. In a northeasterly direction.

Q. A northeasterly direction from there and about how far away?
A. I am quoting roughly now probably some twenty feet or so. I am
only quoting roughly.

40 Q. You did dig a hole there to find if there was any subsidence in the ground? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 31.

William
Ruff,
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*
Plaintiffs'
Evidence
No. 31.
William
Ruff,
Examina-
tion.
continued.

Q. For what purpose? A. To prove if there was any faulty back-filling in connection with our own sewers.

Q. Would that be in the neighborhood of the Gas Company's pipes?

A. I think it would be to the north.

Q. Of the Gas Company's pipes? A. Yes.

Q. Did you find any subsidence of the ground? A. None whatever. the ground was in its natural state.

Q. THE COURT: Where is this?

MR. WOODS: That is northeast from manhole "A" which is in the centre of the street and just opposite the Gas Company's appliances as 10 we see it from this.

Q. This is Exhibit 10. About where did you dig up that place to see if there was any subsidence? Here is manhole "A" and this is your storm sewer? A. I am speaking roughly. We have this in detail somewhere.

MR. SMITH: Wouldn't it be better if we got it in that way? Don't you think it is quite important?

MR. WOODS: Yes, perhaps so.

Q. Do you know whether that twelve inch gas pipe being laid, the top of it is I think about two and a half feet above the top of that twelve inch main, that is from the top of the pavement? A. May I correct a 20 statement I made a moment ago? I stated that the ground was in its natural state. I wish to correct that. What I want to say is this—that there was no evidence of settlement.

Q. Well we will get that a bit later. Now I am at another question and that is the question of the possibility of backfilling a pipe that is pulled under that pavement. Suppose this pipe that is put under there is welded in the lane and eighty feet of pipe put through from one end to the other and there are three holes—one in the centre and one on the east side and one on the west side from which the men backfill the earth 30 from the tunnel they have made and the top of that pipe is two feet six inches from the top of the pavement and the pavement being about eight inches thick, would be less than two feet of space between the top of the pipe as it lay in the trench or tunnel and the bottom of the pavement. You see what I mean? A. Yes.

Q. We will assume for this purpose that the whole of it was taken out? A. For what length?

Q. Well it would be forty feet. There would be three holes one on the east side and another forty feet from there and another on the west side forty feet from there. A. So we will say that the tunnel is twenty- 40 five to thirty feet in length.

Q. No, the tunnel that you are backfilling is forty feet in length.

MR. SMITH: Oh no, it could not be.

MR. WOODS: There is a hole on the outside edge and there is a hole in the middle. There is a hole at each side of 107th Street—at the west side and at the east side and there is eighty feet between these two holes and there is a hole in the middle, according to McGaffin's statement. Now between those holes there are forty feet of pipe?

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

MR. SMITH: I object to that My Lord. Those three holes were all made on the pavement so it is utterly impossible that there should be forty feet of pipe to require backfilling. My friend seems to have the impression that the first hole was put off the pavement and not on it. Well, all
10 three were on it.

No. 31
William
Ruff,
Examina-
tion.
continued.

THE COURT: Is your question directed to the ascertaining of the opinion as to whether it is possible to do something?

MR. WOODS: Well as a practical workman whether it is feasible to backfill a length of tunnel so as to backfill a pipe of that character over that area.

THE COURT: As indicating that anybody should do it the best they could or as indicating that they should not have done it?

MR. WOODS: That they should not have done it. I suggest the tunnel should have been opened by the cutting of the pavement right
20 across and the pipe laid down in an open trench on the bottom of the open trench on the level; that it is not proper construction to do it the other way, and I want to know as a fact from an experienced person whether doing it in this way makes it possible to backfill?

THE COURT: Then it is important to get what the actual facts are.

MR. WOODS: Putting in this assumption, that these holes that are put down. It depends on how big the holes are, but we will suppose those holes are twelve foot each? A. Yes.

Q. And we will suppose that on the outside of each of the holes there are, say seven feet between that and the edge of the pavement? A. Yes.

30 Q. The east hole was dug seven feet inside the pavement and was twelve feet in length. And the next hole was dug in the centre twelve feet in length, and the next hole was dug at the west side twelve feet in length, but it was inside the pavement to the extent of as much as seven feet. Now that would leave fourteen feet of trench between those two places in the centre. Now can you properly backfill that? A. Possibly you could. It is open to question whether they are done properly or not. It could be done by taking time.

Q. Now will you describe the operation? You have got a space there to work in less than two feet high? A. Yes.

40 Q. Will you describe what would have to be done by the workman who was backfilling and gettings something underneath? A. On a tunnel

of twelve feet in length the workman can work from either end of the tunnel so therefore they would only have six feet to throw their earth back and on a tunnel of that size they could accomplish that. They could throw their earth to half way in the tunnel and tamp that. There would be no trouble in doing that. But if your tunnel was twenty-five feet in length it is very near a physical impossibility to do it because they would have to throw that earth at least twice or three times to get it to the centre of that tunnel and if it is only two feet or less there is no opportunity for that man to get it up there unless he pulls it in like a badger or something like that and I am afraid, after observations, that thing 10 does not happen.

Q. Your answer is, assuming on the question I have put to you here having tunnels only fourteen feet long it is possible to do the backfilling properly? A. Yes, it is possible in fourteen feet.

Q. And if you get above that to what extent would you say it becomes impossible? A. Well when men would have to get in twice to throw it to the centre of the tunnel. He could not do it, because he has to fill the hole and then crawl over it and move it again, and he has not got the space.

Q. Now this backfilling has to come around the bottom of the tun- 20 nel so as to lay a bit on the bottom of the tunnel? A. Yes.

Q. And can that be done over a space that is over fourteen feet? A. Possibly, yes. He could probably throw it by using a lot of power to get it around the pipe. He would not fill the tunnel. He could throw it back so some of it could get around the pipe.

Q. Would it make a proper workmanlike job? A. No it would not.

Q. And in order to get that pipe on a firm basis across those streets what should be done? A. Well that pipe should be laid on solid ground.

Q. And what is the only way it could be laid on solid ground? A. Well I would say if that was a forty foot pipe dragged through that 30 tunnel and the contractor, whoever put that work in, if that tunnel was not driven to line and grade, the pipe would not be lying on solid ground.

Q. What do you mean by line and grade? A. Well the ground is uniform all the way through.

Q. Unless the tunnel was so laid that it was laid to a level? A. Yes.

Q. An engineering level? A. Yes.

Q. It would not be level of course? A. No, sir.

Q. What I am getting at is this — suppose you wanted to get that properly laid on the level and on solid ground; can you do it otherwise with a twelve-inch pipe holding gas at high pressure, properly, than by making an open trench and laying it on the ground? A. Yes, you could. 40

Q. Well how? Could you do it by tunnelling? A. You could not do it unless, as I have stated, that is by having an engineer to give you line and grade. It is an impossibility for a man to drive a tunnel of that length and keep himself straight.

Q. You would have to have observations taken that it was on the level from place to place? A. Yes. I have actually seen a tunnel four feet in width and sixteen feet in depth when they have tunnelled through they have actually missed one another. That is allowing men to go down roughly on their own.

At 4:30 Court adjourns till 10:00 a.m., Friday, January 19th, 1934.

Friday, January 19th, 1934,
Court resumes at 10:00 a.m.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 31
William
Ruff,
Examina-
tion.

continued.

MR. WOODS: At adjournment last evening you had been telling
10 us what the method should be of a pipe that was laid in a tunnel as this
pipe was—the proper way to lay it. Now this pipe was removed by the
Gas Company in the presence of the City officials, across 107th Street, in
the month of June. A. Moved by the Gas Company?

Q. That is the portion of it that was broken was taken up and re-
placed. Now you were present were you? A. Yes.

Q. When was that? A. If I am correct I think it was somewhere
about June 20th. It was on a Saturday afternoon.

Q. Just to correct that. My note is that the work was started on
the 14th June and— A. I am certain it was on a Saturday afternoon.
20 I am not just certain of the date.

Q. Now can you tell us how far the pipe was taken up? A. I don't
know the exact measurement but I would say the full width of the street.

Q. The pavement was taken up and a trench dug at that point and
the pipe taken right out? A. Yes.

THE COURT: When was that?

MR. WOODS: Nineteen thirty-two is the date of the report and it
states the work started on Tuesday, June 14th. Were you there when the
pipe was actually lifted up? A. Yes.

Q. Did you see the fracture? A. No, sir, I did not.

30 Q. Now did you examine the trench below the pipe? A. Yes.

Q. What part of the trench did you examine? A. The whole of the
trench from one side of the street to the other.

Q. And what did you find at your examination of the trench? A.
That the pipe had not been rested on a solid foundation.

Q. And what did you find it was resting on? A. It was resting
partly on the original ground and partly on loose backfill material.

Q. Can you tell us how much of it was resting on the original
ground and how much of it was resting on loose backfill material? A.
40 What I mean to say is this, that the north portion of the pipe was rest-
ing on solid ground and the south portion of the pipe at some points was
on backfill material.

Q. The north side of the twelve-inch pipe was resting on original ground? A. Yes.

Q. And the south side of it in some places was resting on loose backfill material? A. Yes.

THE COURT: The pipe ran east and west?

MR. WOODS: Yes.

Q. Can you tell us whether the south side of the pipe—some portions of which rested on loose backfilled material—whether that was a common condition along the whole length of the pipe? A. Practically. From my observation the tunnel had not been driven straight, neither 10 was the grade uniform.

Q. When you speak of the grade being uniform you mean completely level? A. It was up and down.

Q. The grade was up and down? A. To a certain extent—yes.

Q. And what was the nature of the backfill material according to your observation? A. Well it was just a mixture of clay, black soil and possibly a little rubble with it. You know how the black soil at the top gets mixed up with the clay underneath?

THE COURT: Will you repeat it so I can get it? A. Clay, black soil and rubble. Rubble consists of broken brick and broken concrete. 20

Q. MR. WOODS: Did you find any foreign substances of considerable dimensions there—pieces of wood or anything of that kind? A. I would say there were pieces of probably poplar pole about a foot to fifteen inches long on which the pipe was resting.

Q. Did you keep that? A. Yes.

Q. Have you got it here? A. Yes.

Q. Will you let us see it?

(Parcel produced).

Q. This is the poplar pole to which you refer? A. Yes.

Piece of poplar pole about twelve inches long marked Exhibit 26. 30

Q. And was that lying across the trench or tunnel? A. Yes.

Q. And the pipe was resting on that piece of material? A. Yes.

Q. Can you give to the Court about the place on the street where that was found? Was it on the east side of 107th Street? A. It was on the east side to the best of my knowledge.

Q. Between the centre of the street and the east? A. Yes.

Q. And you also produced here several bits of stone. Do I understand that those were taken from that backfill material also? A. Yes.

Q. I will ask to have them wrapped up and marked.

Parcel containing pieces of stone from trench, marked Exhibit 27. 40

THE COURT: Is the proper expression “backfill” material or “backfilling” material?

MR. WOODS: "Backfilling" material.

Q. What would be the effect of the pipe being laid in this tunnel in the way that it was as you saw it. What would be the effect on the pipe? A. How do you mean the effect?

Q. As to its strength or weakness, as to whether it would be liable to break or not? A. Well as I saw it there was possibly two of these pieces of wood supporting that pipe.

Q. Pieces of wood such as Exhibit 26? A. Yes and there may have been more. If the pipe was resting on that much it was, and we all know
10 it was not on a solid foundation, those pieces of wood were not enough to support that pipe.

Q. Do you know whether we could get any information as to how big these holes were, from the City? A. I think probably you may get them from the report of repairing the cuts. The man in charge generally states the dimensions of the cuts that he is repairing.

Q. If there is a copy of the report in the City Engineer's office we could get it? A. Yes.

Q. I am told by the City Engineer that the invoices or reports on the matter have been mislaid in some way, but we will try and get what we
20 want from the Gas Company. Did you find the original bottom of the trench across 107th Street when you were making your investigation? A. Yes, sir.

Q. And it was between that original bottom and the pipe itself that you found this backfilling material to which you have referred? A. Yes, sir.

Q. And how far below the pipe, can you remember? A. Oh I think the depths varied.

Q. What would be the maximum? A. Well I am just giving you a depth as I think of it right now, probably four inches.

Q. Was it at the time of this excavation that you found how the low
30 pressure pipe was supported, or was that another time? A. About all I can say on the other pipe was this, that it was resting at the manhole on the timbers that had been put in originally to support the ground while the manhole was being constructed.

Q. Now as I understand we will have a visual representation of the matter as soon as Mr. Haddow comes in, but in the meantime we have a blueprint. The low pressure pipe is to the south of the intermediate pressure pipe that we have been referring to all along? A. Yes.

THE COURT: It is a ten-inch main low pressure "L.P."? A. Yes.

Q. And it is quite close to manhole "A"? A. Joining it.

Q. And it rested upon the sheeting that stood on end? A. A portion of the sheeting had been carried away to allow the pipe to carry through.

Q. And the low pressure pipe rested on that sheeting, that sheeting being opposite the outside wall of manhole "A"? A. Yes, sir.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 31.

William
Ruff,
Examina-
tion.

continued.

Q. And that is why it had not dropped? A. I would not say that.
Q. But at all events it had not dropped? A. No, sir, I don't think so.

CROSS-EXAMINATION BY MR. SMITH.

Q. This stick you have produced is poplar, you say? A. It may be poplar and it may be spruce.

Q. I thought you said a poplar pole?

THE COURT: He said probably a poplar pole.

MR. SMITH: And it is an exceedingly well preserved piece of wood?
A. Yes.

Q. For one which has been in the ground for eight and a half years? 10

A. Yes, sir.

Q. Nine years it will be in June? A. Yes.

Q. There was a wooden conduit box travelling these two pipe lines of ours? A. Yes.

Q. And it ran roughly three inches from the pipe? A. Yes.

Q. And in places it touched the pipe? A. I won't answer that question because I did not actually see it.

Q. Didn't you see it when it was uncovered? A. Not in relation to the wooden conduit box.

Q. You did not observe it? A. No. 20

Q. You would not be surprised if the wooden conduit box, if it would not take a perfect line it might touch it in spots? A. Yes.

Q. And that box was put there after our pipe was laid? A. Yes.

Q. Some time after the Gas Company's pipes were laid? A. Yes.

Q. What year was the wooden box put in? A. Oh, I could not answer correctly but it will be several years after the gas pipe, anyway.

Q. How was the wooden box put through there? A. I think through open cut construction.

Q. You mean the pavement was removed right across? A. Yes, sir.

Q. I wonder if you are sure about that? A. I had nothing to do 30 with that construction at all.

THE COURT: If it is of any importance I suppose this witness's evidence is not of importance about that—you are not pursuing that with this witness?

MR. SMITH: I am not pursuing the actual facts. Mr. Haddow I suppose will tell us.

THE COURT: Well he said the wooden box was put through an open cut construction.

MR. SMITH: Are you sure of that? A. No I am not certain of that. 40

Q. And there is no doubt that the City of Edmonton in 1926 made an open cut down to the Gas Company's pipe lines. That is if it was open cut it was from the top, to put that box in they went down to our lines? A. Well somewhere about your lines.

Q. Well they made a trench at least to the bottom of where the conduit box is lying? A. I don't know the relation of the grade of the box to the Gas Company lines. I think it is above the Gas Company lines if I remember correctly.

10 Q. I am suggesting to you that you could not put that in without exposing the Gas Company's pipe? A. Possibly a small portion of the northerly line.

Q. No, I am speaking of the entire distance across 107th Street, but we will come to that, but I think you can accept my word for that now. I am examining him now with respect of negligence which was sought to be shown and then I am examining on the conscious act of another volition.

MR. WOODS: What I want to get clear is the cause of action that I have alleged in respect to the pipe—the statute was not complied with.

20 THE COURT: There are three things which cut across, the one of construction and then negligence and then there is the other of exception to the rule which arises as to negligence. The lines of legal liability or exception cross each other.

MR. WOODS: I did not want you to be under any impression that I took seriously Mr. Martland's suggestion that the Water, Gas and Electric Light Act did not apply.

Q. MR. SMITH: I was speaking about the parallelism of the wooden conduit box with the Gas Company's pipe and the necessity, if the box was put in by the open cut method, of covering the Company's mains at that time. Do you follow me? A. Yes.

30 Q. Now I think perhaps you will agree with that. However, it can be proven later. Now this pole Exhibit 26—just where was that found? A. Well I could not say actually where that was found or where any of them was found but I would say this, it was on the east side of 107th Street, east of the centre line.

Q. I think there were people there representing the City who noted that exactly? A. Yes, sir.

Q. Now did you see it in the trench before it was removed? A. Yes, sir.

40 Q. Now I make this suggestion to you that the twelve-inch main of the Gas Company clear across that street was lying at all points on the bottom of the trench and left what you would expect, namely an impression of its roundness in the ground clear across. Now am I— A. Correct.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 31.
William
Ruff,
Cross-Ex-
amination
continued.

Q. So that this piece of pole was in the soil underneath the pipe?
A. Yes.

Q. And looking at this piece of wood, supposing you did not know where it came from, I imagine that having regard to its state of preservation, I mean from what particular spot — knowing that it had been buried some three feet in the ground for some considerable length of time, I am inclined to think you would go with me and you would say you would fix the age at five years rather than eight if you were just estimating from its appearance? A. Not from experience.

Q. I say from its appearance. A. Well I will say this, if you brought that piece of wood to me and told me it had been buried in the ground I would not say how long it had been in there.

Q. You would not care to make an estimate of it? A. No, sir.

Q. Because what struck me—I suppose this wooden box was made of fresh timber? A. Green spruce.

Q. I mean they would not put in rotten material? A. No.

Q. And it shows much more sign of rotting than this piece of wood which you have here? A. Yes.

Q. And it has been in the ground some three years longer? A. Yes, sir.

Q. At least the piece of wood has been in the ground three years longer than the conduit box? A. Yes.

Q. Now you said something which I do not quite understand. You said that the north side of the pipe, that is the twelve-inch pipe I am speaking of, was resting on I think the word was “solid ground?” A. A portion.

Q. On solid ground and the south side was resting on backfill?
A. Yes.

Q. Do I get you correctly? A. Yes.

Q. And I suppose by that you mean that having regard to the diameter of this pipe that perhaps there was a line of cleavage right down the pipe between the backfill and the solid earth? A. In a portion of it. What had actually happened was this, as my impression, that the tunnel had not been driven straight, that is in a straight line, and it had not been dug to grade. When they came to pull their piece of pipe through, which I am told is forty feet in length, we found that they could not bring the ends of the pipe together, that is the portion that came there from the west side and the portion that came from the east side. So it looked to me that they had to straighten up their tunnel to get the ends of their pipes so they could make the weld and they had to dig out the side of the tunnel, the grade of the original tunnel was too low on the south side, they dug all off the north side and that portion which they dug off on the north side that is the solid portion which I say the pipe was resting on.

Q. What you think was this, that the contractor, whoever he is, and this is your reasoning of course? A. Yes.

Q. This is not fact; it is your idea of what took place from looking at it? A. Yes.

Q. Your idea is they looked at the tunnel and found it was not straight? A. That is my observation on the ground.

Q. And they then proceeded to straighten it and make a weld? A. Yes.

Q. Thoroughly good practice, isn't it? A. Well I would not say it was good practice in the way the tunnel was driven.

THE COURT: But good practice after that happened?

MR. SMITH: To rectify it? A. Well that is all you could do.

Q. Well it does not weaken our job? A. Yes, sir. If a trench is dug below grade you have to backfill and if the backfilling is not tamped and put back as good as you can fill it, well, it is not right.

Q. Well I suppose the City after that pipe of ours was lifted, no doubt made a plan of this whole thing and took levels and got the grades? A. I think so.

Q. So there is not much object in you and I guessing at these things if that be the fact? A. Not as regards the grades in line though.

Q. One cannot trust one's eyes for these things? A. I can trust my eye to know whether it was below grade or not.

Q. Well now that whole area across 107th Street had been much and often disturbed hadn't it? A. I would not say so.

Q. Now that used to be an old trail wandering through the bush and stumps in that direction? A. It might have been.

Q. And there is no doubt whatever that the road was then graded? A. Yes.

Q. And I think you have it within your knowledge or within your employer's knowledge that very considerable earth was required at that point to raise that roadway to grade? A. Well I have no knowledge of that.

Q. Have you heard that? A. No, I have not.

Q. Well we will put it this way, that granted I am right that it was necessary to put a lot of earth in there to bring it to grade, then there is no virgin soil there, is there? A. No, not if they had to do that to bring it to grade there is no virgin soil.

Q. And the old sanitary sewer was put in many years ago which rests through the centre of manhole "A?" A. Yes.

Q. And a little bit to the south there is another, I think it is an electric conduit? A. Yes.

Q. And following manhole "A" aside from the old sanitary sewer, there are three other lines which had been excavated radiating out from that centre? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 31.
William
Ruff,
Cross-Ex-
amination
continued.

Q. And then on the south side also there is the telephone cable box some few feet away from our pipe. But what I want to get from you is this, that that ground generally, and it will later no doubt come out exactly to what extent, has been greatly disturbed ground? A. Yes, to a certain extent, yes.

Q. And that is true in carrying underground services across streets in any modern city. That is true, isn't it? A. Yes.

Q. As a matter of fact if we are going to lay in Edmonton—say we are going to put down another gas system or another sewage system, street crossings and so on, we do not expect virgin soil. We are putting it into worked over ground in the main sections? A. There is very few places where you do not come into contact with virgin soil. 10

Q. You mean you discover virgin soil every now and again? A. No, not every now and again, the other way, every now and again.

Q. Well when the model comes it will show, even a layman like me, as to how much work has been done? A. Yes.

Q. Now you do not attempt—you say that our pipe was lying crooked in that hole? A. No, sir.

Q. And about these pebble stones. At what portion of the trench did they come from? A. I would say from the manhole east. 20

Q. From the manhole east? A. Yes, at various points.

Q. Now they are natural Alberta pebbles, aren't they? I mean as smooth as you will find them at Lake Wabamun? A. Yes.

Q. They are not pieces of concrete. They are natural to the soil of this country. A. I think if you examine some of it closely you will find probably pieces of cement with it.

Q. I wish you would come down here and show me which ones are made of cement? A. Well here (indicating).

Q. You might point out to his Lordship that on this piece of rock there is a slight piece of cement attached? A. Yes. 30

Q. What you mean is this, that these pieces of rock composing Exhibit 27 have in spots a very thin layer of dried cement attached to them? A. Yes.

Q. But I am still correct in saying that they are the ordinary type of small gravel or small rock we find in this country? A. I guess so.

Q. And if you were backfilling a trench I suggest to you that you would not if you had, unless there was a great quantity, strained your material to take out those few pieces of rock in that area? A. Oh no. If it was backfilling it would make no difference at all.

Q. Well what are they here for? A. Well to the best of my knowledge they are here as an exhibit as to what was taken out of the trench. 40

Q. And that would be the backfill? A. Yes, a portion of it.

Q. As you say that bit of rock of that character would make no difference to the backfill at all. You would not be bothered straining them out. A. It would not make the slightest difference.

Q. And I still do not know what they are here for. So just to return to one thing, I think you told me our pipe was laying straight? A. I would not say it was straight.

Q. Well it was not crooked. A. Well it was not crooked in the sense of the word crooked.

Q. When you said to Mr. Woods that the tunnel was not straight that is to your eye of course? A. Yes.

Q. The grade not uniform and you later told me that the pipe itself was straight? A. No, I did not.

10 Q. I thought you did.

THE COURT: He said at your suggestion it was not crooked.

MR. SMITH: Well it was not crooked. A. Well not in the sense of the word crooked.

Q. Well by crooked I do not mean dishonest. I mean off the straight. A. I would not care to answer that question as regards to being straight.

Q. As it was lying there wasn't it reasonably straight? A. Reasonably straight.

20 Q. And there is no such thing as an exactly straight pipe line anywhere in the world, is there? A. No, sir.

Q. Did our pipe line appear to you to be insofar as being straight is concerned, to be in good condition? A. Yes.

Q. So that the fact that the trench may have been a little bit—as long as the pipe is all right it is not going to hurt anybody.

THE COURT: He said the tunnel had not been driven straight, neither was the grade uniform.

MR. SMITH: Now I suppose it is—we will say that you are doing a lot of trenching with a view to laying pipe. It is not unusual for a short distance for your men to get a little below the grade occasionally? A. 30 No, sir.

Q. And then you backfill? A. Yes. When we backfill we tamp it until we can get it near its original formation.

Q. Now you mentioned a hole being dug by the City on 107th Street on a line from manhole "A" on a line of the storm sewer. That is the new sewer which was put in when? A. In 1931.

Q. That was put in by the City? A. Yes.

Q. And that runs from manhole "A" to manhole "B"? A. Yes.

Q. Were you on the construction? A. No, sir.

40 Q. It was a contracted job? A. It was part of the relief program.

Q. But wasn't it contracted? A. Yes.

Q. And you said the hole had been dug. Do you mean by that that the pavement was removed or do you mean it was any more than a core taken? A. No, the pavement was removed.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 31.

William
Ruff,
Cross-Ex-
amination
continued.

Q. In what year? A. I could not answer that, possibly our plans will show it.

Q. Perhaps my friend can help me?

MR. WOODS: I don't know where you are at.

MR. SMITH: He said there had been recently a line taken.

MR. WOODS: I am putting in the witness who made the excavation to ascertain whether there was subsidence underneath these gas mains. I am putting in Mr. Underwood and Mr. Haddow, his chief, to show just what happened to that, in full.

MR. SMITH: Very well, I won't go any further with it now. 10

MR. WOODS: To make clear what my friend mentioned to you. This plan will be verified when Mr. Haddow goes in the box. But there is a question I want to clarify.

MR. SMITH: Well mark it now.

**Plan showing location and elevations of utilities 107th Street
and lane, marked Exhibit 28.**

RE-EXAMINATION BY. MR. WOODS.

Q. Mr. Smith asked you about whether there was virgin soil in a number of these places. Now take that place. It goes to the west side?
A. Yes. 20

Q. And in the centre there are these various constructions shown on the plan which will be shown in the model? A. Yes.

Q. And apart from where those constructions are in the centre of the street is the rest of the soil three feet below the pavement from the east side of the street, the west side of the street, virgin soil on the corner of 107th Street? A. Where the north side of the pipe was resting on I would say it was virgin soil.

Q. But it is capable on that street except at those points—the pipe could have rested on virgin soil? A. Three feet below, yes.

Q. But of course where these particular constructions were, and the ground had been disturbed the soil would not be virgin? A. It would not be if it had been disturbed. 30

Q. That wooden conduit box that carried the street railway return cables. Would there be any occasion for it to be strictly on grade or according to grade? A. I don't think so.

Q. The cables, I gather, are very straight cables, in the box. They carry the return current of the street railway? A. Yes.

Q. Did you see them? A. I have seen them.

Q. How big are the cables? A. Well it is pretty hard to say.

Q. Well two or three times as big as this pencil? A. Oh yes. I could not say correctly, but something like my thumb, something like that.

Q. And the purpose of the box that carries them is to just protect them? A. Yes.

Q. From surrounding earth? A. Yes.

Q. I mean, a rotten box as long as it will hold together would do as well as a good box? A. Just the same.

10 Q. And my friend asked you about that box. Did you find at this place across the street when the pipe was being removed—what was the condition of the conduit box there? A. It was in poor condition.

Q. Porous? A. Yes.

Q. It was originally green lumber? A. Green lumber, yes.

Q. And I think my friend said to you or asked you whether you saw on the bottom of this trench when it was open the impression of the twelve-inch pipe. Did you? A. Yes, sir.

Q. Do you remember how deep that pipe had apparently sunk in there? A. No, I do not know.

20 Q. Would that show displacement of the material? A. I would not say that it would.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 31.

William
Ruff,
Re-Exam-
ination
continued.

No. 32.

Evidence of Samuel Graham Francis.

No. 32.
Samuel
Francis,
Examina-
tion.

SAMUEL GRAHAM FRANCIS, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. Now you are employed in the sewer department? A. Yes, sir.

Q. And at the instance of Mr. Ruff or at the instance of your employer you did I believe take a certain amount of backfilling material from behind the Corona Hotel in the lane south of Jasper on 7th Street?

30 A. I would not say backfilling. It was taken from the excavation of the basement on the lane.

Q. And it was behind the south wall of the Corona Hotel? A. It was on the south side of the south wall.

Q. And it was right next door to the south of the wall? A. It was close up to where there was excavating.

Q. And that material you have produced here in four sacks? A. Yes, sir.

No cross-examination.

Four sacks of backfilling material, marked Exhibit 29.

MR. WOODS: I would suggest that your Lordship examine these four sacks and save us spreading the contents all over and so making a dust. (The Court examines Exhibit 29).

No. 33

Evidence of Ernest John Atherton

ERNEST JOHN ATHERTON, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. You are a salesman for the Motor Car Supply Company attached to the Calgary office? A. Yes. 10

Q. But you happened to be here in town on the night of the 21st of February, 1932, when the Corona Hotel fire happened? A. Yes.

Q. In which building your office is situate in Edmonton? A. Yes.

Q. And Mr. Colin Mackenzie went in along with his brother Alec and you to the front part of the Motor Car Supply Company's office to salvage some records he desired to get. That is true? A. Yes.

Q. You went with him? A. Yes.

Q. When you got inside will you tell what you saw or observed as to whether there was fire or smoke there—any fire if you saw it? A. There was no sign of fire whatever. There was nothing but smoke, the smoke was quite heavy. 20

Q. And could you tell if there was any fire downstairs? A. It was hard to tell that. There was no sign of fire in the building.

Q. In the basement? A. No.

Q. Now your sense of smell is good? A. I believe so.

Q. And did you smell anything but smoke there? A. No.

Q. Did you smell any extraordinary smell at all? A. No, nothing but wood smoke.

CROSS-EXAMINATION BY MR. SMITH.

Q. You did not smell any smoke from natural gas—just wood smoke? A. I smelled nothing unusual, just heavy smoke. 30

Q. Well you said wood smoke? A. Yes.

MR. WOODS: You did not smell any smoke from burning rubber? A. No, I did not.

Evidence of George William Underwood.

*In the
Supreme
Court of
Alberta*

GEORGE WILLIAM UNDERWOOD, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Plaintiffs'
Evidence

No. 34.

Q. What department in the City are you engaged in? A. In the Engineer's Department.

George
William
Underwood
Examina-
tion.

continued.

Q. And were you in charge of the investigation that was made by the City to ascertain what the condition of the ground was between the weir chamber at manhole "A" at the corner of 7th Street and the lane south of Jasper and the main of the gas company laid above that weir chamber? A. Yes, between "A" and "B", manhole "A" and manhole "B".

Q. Now just tell us what you did. Perhaps I ought to get a picture of this weir chamber. There is an exhibit here, 28, a little picture I was looking over and that shows the general place where the manhole is. That is manhole "A" and that is manhole "B" and that is the fifteen-inch tile sewer from manhole "A" to manhole "B". Now just explain this manhole to the Court and what the weir chamber is and what it is for and where it is and how far below the gas company's main? A. Well as regards the depth below the gas company's main I do not know the gas company's mains so I could not give you anything near it. But as regards what we did—we were ordered to go to work and open up a hole in the overflow chamber which is the weir at the top in the north-east corner and we did so and we went to work and we got some reinforced steel from the Corona Hotel and we pushed that as far as possible and there we found nothing.

Q. What do you mean? A. We found no settlement, no loose material at all. That was absolutely solid.

Q. Solid ground. A. And then we went to work after Mr. Haddow's orders and we went in on the roof of the weir chamber. That was going in more level by the top of the tunnel they had dug at about somewhere approximately three feet from "B" to "A", so that we were then practically in line with the top of the roof of the tunnel and we took the bar when we got in there. We bent it so we could get it about eleven foot length down the manhole, bent it and straightened it again. We took a 2 x 4 and we tried to find any cavity there was and we found no cavity whatever.

Q. When you speak of finding no cavity do you mean no settlement?
A. I mean no settlement. There was no settlement.

MR. SMITH: You should not mention that to him.

MR. WOODS: I thought he meant settlement. I was using it in the same sense.

Q. And what else did you do if anything? A. I am sorry I made that blunder between settlement and cavity. A cavity is a part that is not filled, but we did not find any whatsoever. The chamber, the weir chamber, the six-inch so-called roof of the weir chamber, in that case would measure at least ten inches of concrete back to solid roof above the chamber which can be found to be correct. The sides, the bricks, one long, one header so all the backfilling stuff goes in solid.

Q. Now can you give us an approximate idea what the distance between the top of that weir chamber is and the intermediate pressure main? A. I have no idea whatsoever. 10

Q. Did you notice the low pressure pipe of the gas company when you were making this investigation? A. No, we did not see either of the gas mains. We know they were there only.

Q. Were you inspector when the work was done in 1930 and 1931 in the building of this—it was the fifteen-inch tile overflow sewer from manhole "A" to manhole "B". A. I was.

Q. And did you watch the progress of that work from time to time? A. Yes.

Q. And will you describe to the Court your information as to whether that work was done in such a way, the backfilling done in such a way, as to make for settlement or no settlement? A. I believe that— 20

MR. SMITH: I am just wondering. This is an opinion that is asked for now.

THE COURT: The witness started by saying "I believe." I suppose that is an opinion. What is your objection?

MR. SMITH: I imagine this gentleman has had enough experience to give that but it seems to me my friend might have shown that. He merely said he was "attached to."

MR. WOODS: But I did not mean him to give an opinion at all. He was the inspector on the job and inspected the actual backfilling done on the job and I am asking him as to the character of that backfilling that he saw on the job that was done in 1931 when the fifteen-inch tile overflow was built from manhole "A" to manhole "B". Go on, sir. What was the character of the backfilling on that job? A. The backfilling was a backfilling with unfrozen earth placed in by layers and tamped in by hand tampers—iron tampers. 30

Q. And how long a piece of pipe would be put in before the tamping would be done on it? A. Seven feet six inches of tile laid in, which is the rule, so that we can go to work and tamp back and then one pipe placed in after that until we come to the original point we are making for. 40

Q. And how long is the pipe? A. Two feet six inches.

Q. And as each piece of pipe was laid do I understand backfilling was done in respect to that piece of pipe? A. Supposing seven feet six inches which gives you room to tamp. You tamp up to the last joint you make so that there can be no shaking of cement and then you place in one more pipe and you tamp back from the second pipe from the face so that you do not remove more cement. If you do you see that joint and place it back.

Q. And what is this here, these three— A. Well those three pipes. The first pipe enters into a wall which only leaves there about six or
10 seven feet.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 34.

George
William
Underwood
Examina-
tion.

continued.

CROSS-EXAMINATION BY MR. SMITH.

Q. What was the first things that was built in connection with this storm sewer on 107th, Manhole "B" for example, was a part of that construction? A. Yes.

Q. What was the order of building that took place at that time? What did the contractor first do? A. Went to work and dug the tunnel from "B" to "A".

Q. Did he build manhole "B"? Did they finish manhole "B"? A. No, they left manhole "B" until last as everything was completed to the
20 invert of manhole "B".

Q. Everything was constructed and manhole "B" was the last thing to be built? A. Correct.

Q. And where did they do their tunnelling from? A. From manhole "B" to manhole "A".

Q. They went from "B" to "A". Is that right? A. Correct.

Q. That sewer has an outlet from "B" to "A"? A. Correct.

Q. What was done after the tunnelling was done? What was the next construction? A. Placing in the foundation of the weir chamber.

Q. Was manhole "A" broken out for that purpose? A. Yes.

30 Q. And who did that, do you know? A. The bricklayer that was with the contractor.

Q. Do you know who that was? A. A man by the name of Mr. Denmark.

Q. I was asking you the name of the bricklayer and you said it was Mr. Denmark. What sort of brick is this weir chamber composed of, red brick or white brick? A. Hard clinker brick.

Q. And you told Mr. Woods how it was laid? And I did not quite get what you mean. How was it laid? A. One brick, taking it eight
40 inch level with the wall and then a header so that the concrete could go in between the backfill to the solid ground.

Q. That was on the outside surface of the weir chamber you are speaking of? A. Yes.

Cross-Ex-
amination

Q. And the weir chamber was built, I take it, and the pipe connected before any backfilling was done. Is that right? A. Connected to what portion may I ask you?

Q. The pipe connected to the weir chamber. That pipe is built solidly into that weir chamber? A. Correct.

Q. And that was no doubt done at the time the weir chamber was constructed? A. Yes.

Q. That was part of that construction? A. Yes, sir.

Q. And then the pipe was laid from manhole "A" to manhole "B"? A. Yes. 10

Q. And was backfilled from "A" to "B", working from "B"? A. Yes.

Q. That is the way I have understood your story so far. Now how was the weir chamber itself backfilled? A. There was no backfilling whatever to do at the weir chamber, none whatever.

Q. We can accept it then that no backfilling whatever was done at the weir chamber? A. No.

Q. And the top of that weir chamber is a poured concrete slab? A. The roof, yes, reinforced.

Q. As I understand it the walls of the weir chamber are made of brick and the roof, a form was put in, I take it, and concrete poured to what thickness? A. It called for six inches but to fill to the solid roof I should say at least ten inches were placed. 20

Q. So what you mean is that having your cavity over your weir chamber they pushed concrete in from manhole "A"? A. Correct.

Q. Forcing that concrete to join with the earth which was up above? A. Correct.

Q. That is the position? A. Correct.

Q. And there is no doubt about this, that the trench, in your judgment, coming from manhole "B", at least the tunnel from manhole "B" to manhole "A" was at the weir chamber, just three feet in height? A. Three feet in height at the lower portion near to where the pipe is. 30

Q. What was the height of the tunnel at the weir chamber? A. The height of the tunnel was made approximately three feet three inches. The excavation for the weir chamber according to the different size of pipe, but that would run fifty-two inches or approximate, width; the height five feet six inches and the back of the weir chamber to three feet.

Q. Were you speaking of the excavation of the weir chamber itself? A. Yes. The roof goes down against "A". It is three feet. The weir is three feet high at manhole "A". 40

Q. You mean inside measurement? A. Yes, with about two feet four inches at the back. The roof is sloped and you can fill the concrete low and tamp it all you want.

Q. What was the size of the excavation for the weir chamber? A. Forty-two inches wide approximate: five feet six inches at the face to manhole "A"; and about three feet six inches approximate at the end away from manhole "A".

Q. That is on account of the sloping roof? A. Yes.

Q. And are you speaking from memory with respect to those dimensions? A. I am speaking from memory by taking off the blueprint which it calls for the weir chamber, to be finished to a certain measurement according to the size of the pipe.

10 Q. You have a plan and specifications somewhere of a weir chamber of a certain size. You have that on your blueprint? A. Yes, I had at that time.

Q. And you are estimating the size of the excavation necessary to permit the building of a weir chamber of that size and dimension—that size and shape. That is what you are doing now? A. Yes.

Q. And that is where you give me this five foot six inches, this three feet three inches. Yes, I follow you. Now is there any opening in the manhole about the weir chamber? I mean has it been opened above the weir chamber? A. Yes.

20 Q. When was that done? A. Well I would not like to say but I should say somewhere about the latter part of June or July.

Q. Of last year? A. Last year.

Q. And that was done at the time you did this testing with the steel rod? A. Yes.

Q. And in order to do that you had to break out the side of the manhole? A. A part above the weir chamber about one foot in height and about thirteen inches wide.

30 Q. And that was the manhole "A" when you broke out that hole—it was in its original condition. There was no other hole there, no hole had been broken there at any time previous to that day? A. No not above the chamber.

Q. And in other words there is no question at all that at the time the weir chamber was constructed, manhole "A" was not broken through for the purpose of backfilling? A. I already mentioned there was no backfilling to do at manhole "A".

Q. Then you will probably agree with me, you the inspector on that job, that all the backfilling that was done in connection with the weir chamber or the sewer pipe, the fifteen inch pipe going into it—was all done from manhole "B"? A. Yes.

40 Q. There was none done from manhole "A"? A. Yes, other than the finishing of the face in the manhole to make a finished job with the wooden form.

Q. That is on the inside? A. Yes.

Q. I think we understand each other. All I have in my mind is this, that whatever backfilling was done it was all done from manhole "B" and none done from manhole "A"? A. No.

Q. What date, I think you said June or July you made this investigation—of 1932. Can you fix it any more closely than that? A. No.

Q. Who was with you on this occasion? A. Well as regards the laborers that were there doing the work I do not know that I can mention their names.

Q. Perhaps there was someone with you who might not be a laborer? A. But there are some of the witnesses here who were there inspecting it at the same time.

Q. Who were with you? A. Mr. Menzies, Mr. Ruff. After we had done the work there was Mr. Haddow and four or five more others which I could not mention. 10

Q. Who was down the manhole. Who did the work down there. Were you in charge of that? A. Yes.

Q. Was Mr. Haddow down the manhole? A. Mr. Haddow went down the manhole to see the work.

Q. Was Professor Morrison down there? A. I believe so, from the University.

Q. You were only there on the one occasion and I am told that was the 7th of July. Were you only there on the one occasion? A. Yes we were only there on the one occasion. 20

Q. And you would accept that as being the 7th of July, 1932? A. Yes.

Q. Now where did you break through that hole? A. In the northeast corner, at the inside of the weir chamber right next to the roof.

Q. Now this is Exhibit 28. If you will look at the figure in the centre where you see manhole "A" and over there manhole "B" you will see a view of the top of the weir chamber? A. Yes.

Q. Just in what part of the weir chamber did you break through? A. Here (indicating).

Q. That is the northeast corner at the roof? A. Yes.

Q. And is that the only hole that you broke through, the northeast corner at the roof? A. Yes. 30

Q. And is that the only hole that you broke through that day? A. No. We went over the roof of the weir chamber.

Q. And broke through the manhole itself there? A. Just broke through the brick work.

Q. And how big was that hole you broke through? A. About one foot by about eight inches.

Q. And the one in the weir chamber was how big? A. That was about six inches by eight inches.

Q. And the method you adopted then was pushing steel rods into the earth? A. Yes. 40

Q. You told me how this fifteen inch sewer was constructed—a weir chamber was constructed. Were you there yourself down below and saw this? A. Yes.

Q. And this pipe was laid up-grade, was it? A. Laid down-grade.

Q. It is down from "A" to "B", is it? A. Yes.

Q. And, as I say, you have been speaking of personal observation. That is correct, is it? A. Yes.

Q. And what other inspection were you doing at that time?
A. Inspecting at times 102nd Avenue on city work when time permitted me.

Q. What I have in mind is this, that this fifteen inch tile cross-over was a very small part of a large storm sewer construction. Am I right about that? A. Correct.

Q. And you were inspecting the whole job? A. Yes.

10 Q. Your inspection covered a good deal more than these few feet of ground here? A. Yes.

Q. And how often were you on this job at 107th Street? A. Practically every time there was anything doing.

Q. What do you mean by that. Was it not carried out by continuous work? A. No.

Q. Well how was it done? A. Well a tile was laid and backfilling done and lay more tile and backfill. Therefore you do not have to be at a place all the time for backfilling, because you can take a bar with a point on and push it back and see if it was backfilling.

20 Q. I am not suggesting you should be there all the time. I am trying to find out how much you were there. A. That would be very hard to say.

Q. Well would it be once a week? A. Fifteen times and probably twenty-four times a day.

Q. You are not working twenty-four hours a day, I take it? A. No.

Q. What hours were you working? A. From eight to four.

Q. From eight o'clock in the morning to four. That is eight hours?
A. Yes.

30 Q. And time off for lunch? A. No.

Q. So that in the eight hours going twenty-four times, that means you visited that place three times an hour? A. Sometimes less, sometimes more.

Q. What other inspecting were you doing at the time? What other work was going on? A. At that time very little going because practically all the blocks were laid from 107th Street from the north and very little was doing down from 102nd Avenue.

Q. And how did they backfill it. How was that done? A. Under old sets of headers of timbers and concrete, plaster and dirt.

Q. How was the backfilling done? A. Hand tamped.

40 Q. And water flushed? A. No not on top of the tunnel blocks. The shafts were water flushed.

Q. And what is the description. What is the shaft? A. The shaft they excavate to go down to the invert where they want to work.

Q. And how deep was this sewer laid? A. Approximately sixteen to seventeen feet at 107th Street.

Q. It was not open trench? A. No.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 34.

George
William
Underwood
Cross-Ex-
amination
continued.

Q. They went down in a shaft and then did their tunnelling?
A. Correct.

Q. And you say the tunnel was hand tamped? A. Yes.

Q. The backfilling? A. Yes.

Q. And was not water flushed? A. No.

Q. And why was the shaft water flushed? A. It was to settle it so they could get a foundation and go ahead and take levels and go ahead and so permit traffic to go over.

Q. And when they did that I take it that they hand tamped it as best they could and then they would add at least twenty-five per cent more dirt by water flushing A. Correct. 10

Q. So there is no doubt at all that a place which has been excavated and then hand tamped will carry twenty-five per cent. more dirt with water flushing? A. In some places only.

Q. I am speaking of the soil of the City of Edmonton? A. Yes.

Q. There is no doubt about that is there? A. Oh yes.

Q. Well where? A. Because that frozen material that is on a job which is left from digging out whereby they could backfill tunnels, the old frozen dirt goes into those shafts and that is thawed out, where it cannot be packed with frozen dirt in any tunnels. 20

Q. A moment ago you were talking about ordinary hand tamping. And this sewer was not built in the winter time was it? A. Yes.

Q. All the work done in the winter? A. Yes, practically. I do not think it overlapped the month of May.

Q. I thought it ended April or May? A. Yes.

Q. And will you tell me whether or not we will take dry earth, I mean unfrozen earth, and fill it in the shaft and hand tamp and I suggest to you with water flushing you can still add twenty-five per cent. more dirt? A. No, sir, not always, sir, no.

Q. Well when can't you do it? A. When there is a lot of sand mixture in it. In some parts of the city you go to work and you have quite a job to scrape up to fill the ditches. You take the Highlands and many other places— 30

Q. I am taking the area in the neighborhood of 107th Street. And I suggest to you there if you hand tamp a shaft with unfrozen dirt that you can add twenty-five per cent. more dirt by water flushing. Am I right? A. twenty-five per cent. is an awful lot.

Q. Well how much would you say? A. I would say that you could add fifty per cent. providing it was froze but if the dirt was not froze and was in small particles you would not add twenty-five per cent. more by water flushing. 40

Q. How much would you add? A. If the dirt was small you would not average more than ten to eighteen.

Q. This storm sewer cross-over from manhole "A" to manhole "B" was not water flushed? A. As regards the room there, it is a long way short of the amount of circumference in the shaft.

Q. I do not understand what you said? A. A small tunnel only about a foot wide at the top and only about two feet at the bottom, there is not such an awful cavity to fill if you have to backfill, that would settle.

Q. I asked you whether that tunnel was water flushed and I want you to tell me. Was it? A. It was not water flushed from manhole "B".

Q. So we now know that this tunnel was first hand tamped and then water flushed from manhole "B". That is right, is it? A. Correct.

Q. And we are water flushing up-grade, are we not? A. No I would not like to say you are water flushing up-grade.

10 Q. You told me a moment ago it was down-grade from manhole "A" to manhole "B" and if that is so it must be up-grade from manhole "B" to manhole "A"? A. As regards the invert, yes.

Q. But the pipe runs up-grade from manhole "B" to manhole "A"? A. Correct.

Q. And the tunnel runs bigger? A. The invert.

Q. What is that? A. I mean the bottom tile is taken from an invert.

20 Q. It is the bottom I am interested in. And when you are doing your water flushing there is no doubt that you are water flushing against a dead-end at that weir chamber, aren't you? A. Yes, the dead-end is the weir chamber.

Q. And I suggest to you that if you water flush on an up-grade using that as meaning the bottom of your trench—if you water flush against a dead-end there is only one place for your water to get out and that is where you put it in. It has to come back? A. If you put too much in, yes.

Q. There is nowhere else for it to go except to return? A. Yes to the wall of manhole "B".

30 Q. And there is no doubt that water returning on grade will carry soil with it. If you are water flushing against a dead-end the return of the water is bound to take soil from that dead-end, isn't it? A. No, sir. I cannot say that.

Q. You won't agree with that? A. No.

Q. Do you want to deny it? A. Well to all my experience as long as you have got backfilling to the amount of two feet six inches over your ground is sticky enough. That has worked underneath and alongside your tile and it takes a lot of water to bring it out.

Q. What I suggest to you is this, that when you are water flushing up against a dead-end the tendency is for the receding water to take the dirt with it and give you cavities at your dead-end. Am I not right?

40 A. The roof of the tunnel?

Q. I was mentioning water flushing in this tunnel against a dead-end and we have been told that the bottom of the tunnel is down-grade from manhole "A" to manhole "B". And I suggest this to you, that the water returning along that trench or pipe will leave a cavity against the dead-end. That is the natural thing to happen. Am I right? A. A very small

*In the
Supreme
Court of
Alberta*
Plaintiffs'
Evidence
No. 34.
George
William
Underwood
Cross-Ex-
amination
continued.

portion of it would travel near the invert on any pipe providing it had settled down around the pipe. I have seen water come over half way up the tunnel at full stream. In my own experience that is practical. When the dirt is settled it must come over the top.

Q. In other words it had an outlet in the case you are speaking of?

A. Yes.

Q. And in this case it had none except at the place it was put in?

A. It had no outlet there.

RE-EXAMINATION BY MR. WOODS.

Re-Exam-
ination

Q. When you spoke of that hand tamping being water flushed, that 10
is the hand tamped ground between manhole "B" and manhole "A"
coming up to the weir chamber? A. Yes.

Q. Where was it water flushed from? A. Well after the fifteen inch
tunnel had been hand tamped the concrete there was run.

Q. Will you repeat your answer to me, starting— A. When the
tunnel where the fifteen inch line was laid was hand tamped and com-
pleted to that point.

Q. Being at manhole "B"? A. To the face of manhole "B", then
the manhole was built, ordinarily one foot, two feet, above the height of
the tunnel. 20

Q. Above the height? A. Above the height of the top of the tunnel.
Then the water is supposed to flush a certain amount of tunnel. Other
dirt is thrown in.

Q. Water is supposed to flush a certain amount of the tunnel?
A. Then the rest of the manhole is built up, filled around with loose
dirt, water flushed, filling the rest of the part of the tunnel which may
not have been completed.

Q. And that is what you mean when you said it was water flushed
at "B"? A. At "B"?

Q. You use the expression, at the shaft. That is what you mean? 30
A. Yes.

Q. And that is how it was water flushed? A. Yes.

Q. And I think my friend was under a misapprehension, water
flushed as you went along the fifteen inch tile—that is wrong? A. Yes.

No. 35.

Evidence of Albert Walter Haddow.

No 35.
Albert
Walter
Haddow,
Examina-
tion.

ALBERT WALTER HADDOW, being called as a witness on
behalf of the plaintiffs and having been duly sworn was examined by
Mr. Woods and testified:

Q. There has been a plan put in here marked as Exhibit 28 which 40
you handed to me. That was made by you? A. Yes.

Q. You are the City Engineer? A. Yes.

Q. And you have had a good deal of engineering experience?

A. Yes.

Q. And a good deal of experience in laying sewers and drains and all the things we are interested in here? A. Yes.

Q. Now will you take that plan and you have prepared a model of the construction at the corner of 107th Street and the lane there in the centre? A. Yes.

Q. And the model is in Court? A. Yes.

10 Q. I would like you to take the plan with the model and explain to the Court the model which I will have marked as an exhibit and which you have done in order to make the position clear and explain it with the model and with your plan both together? A. Yes.

THE COURT: I suppose the model is going in without objection?

MR. SMITH: Yes, my Lord. I intend to ask him a question about it.

Model marked Exhibit 30.

MR. WOODS: Take the plan and illustrate the plan by reference to the model. A. I am referring to Exhibit 28. That is our plan of August 13th, 1932. This is a plan which shows the intersection of 107th Street and the lane south of Jasper and it includes a plan of the various utilities that are laid on that intersection and below is a vertical longitudinal cross section of the gas mains with other auxiliary information which can be deferred until later and on the upper left hand corner is a cross-section, a longitudinal cross-section of what is referred to as the storm sewer between manhole "A" and manhole "B". Now referring to the model, the various drainage features are shown in red. The same colors are on the model as on the plan. In the centre is what has been called manhole "A" and at the northeast corner is what is called manhole "B", that is the manhole of the sewer overflow system. Going from manhole "A" is a sewer which goes up and down 107th Street and was constructed in 1907. And in going east and west is another sewer, twelve inch, which was constructed in 1907. That goes along the lane south of Jasper. Joining manhole "A" and manhole "B" is the storm overflow sewer. That manhole is shown and the protuberance at the bottom is what has been referred to as the weir chamber. It is the chamber at which the drainage overflows from the regular system into the storm overflow system and operates only when the main system is congested.

Q. It is done by a little weir inside? A. Yes. Further up from the manhole leading northeast, southeast and southwest are catch basin leads. That is, they simply drain the catch basins, one of which is apparently shown on the northeast portion. They take the surface drainage from the street and convey it by these small leads into the manhole. Going across from east to west on the model first of all is a ten inch water

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 35.
Albert
Walter
Haddow,
Examina-
tion.

continued.

main which goes along the lane. There is shown in green going east and west a telephone conduit which was constructed in 1910. That is just on the south side of the manhole and as a matter of fact it cuts through the outer wall of manhole "A". Just immediately north of manhole "A" and running east and west are the two gas lines, the one nearer the manhole is the ten inch low pressure gauge and the one immediately to the north is what is called the intermediate pressure line of twelve inch steel pipe. They are lying close together. Immediately north of the latter close up, is the street railway conduit. Now along the sides of the model are a series of black lines which are parallel black lines. This will enable us to get 10 depths. On the bottom of the model are checkerboard squares and these squares, each square represents five feet to each side. The top of the model is simply a board, black, which represents the pavement surface and I forgot to put in another water main which runs north and south on the east side of 7th Street and it would be twenty-four feet east of manhole "A" and it actually joins up with the other ten inch main.

Q. Does this model show the sewer? A. Yes it shows about twenty-five feet of it east of manhole "A" and this sewer, I have plans which will show—it continues up the lane south of Jasper. That is the red stick, east and west at the bottom of the model, of the twelve inch sewer, built in 20 1907.

Q. And the date of the various constructions, the earliest one that I see here is that twelve inch sewer? A. There was a twelve inch sewer, a twelve inch tile sewer east and west along the lane constructed in 1907.

Q. That serves the Corona Hotel? A. Yes.

THE COURT: The two red lines indicating that are the outsides of the pipe? A. Yes. And the edges of the pipe are outside the words "twelve inch tile sewer."

Q. MR. WOODS: And the ten inch cast iron water main in 1908 is the next? A. There is another sewer running north and south on 107th 30 Street marked eight inch tile sewer constructed 1907. The two sewer mains were constructed in 1907.

Q. And the ten inch cast iron water main of 1908, that is the blue one? A. It runs east and west along the lane and south of the manhole "A".

Q. And the next construction I have here is the street pavement in 1913? A. That is the street itself, 107th Street was paved in 1913 and that extended to the east and west property lines of 107th Street at the lane, what we call wings.

Q. And the next construction that I have is the twelve inch interme- 40 diate pressure gas main and the ten inch low pressure gas main of the Gas Company? A. The twelve inch main was open for installation August 7th, 1923, and the ten inch low pressure gas main open on September 10th, 1923.

Q. And the next is the street railway return cables in their boxed culvert in 1926? A. Yes, that is immediately north of the gas mains.

Q. You will observe that it is in point of fact—it is not exactly on the same level but it is above it? A. It is above it.

Q. It is about three inches from the intermediate pressure line? A. Yes.

Q. The intermediate pressure line lying right beside it, as shown? A. Yes.

Q. And the next construction I have is the pavement on the lane in 1927? A. Yes the lane south of Jasper was paved up to there in 1927.

Q. And the last construction is this fifteen inch tile overflow? A. In 10 the winter of 1930-1931, completed in May, 1931, was the storm sewer connection.

Q. The storm sewer connection that Mr. Underwood has been speaking of between manhole "A" and manhole "B"? A. Yes.

Q. What is the object of that? A. The object of the storm relief sewer is when the ordinary sewer system became congested due to rapid growth of the city and the paving of a great deal of the street and lane area, that was causing congestion on the mains and resulting in the flooding of adjacent property and this storm water system was constructed as a relief to that system and it operates whenever the red system, that 20 is the old original system, is overtaxed. Whenever the sewage rises a foot or a foot and a half, instead of flooding and finding relief in the connections, it simply overflows a little weir which is constructed in a chamber and finds entrance to a very large tunnel which discharges just below the bridge down below the Macdonald Hotel.

Q. And that is why that tunnel is on a grade there? A. Well all tunnels are on a grade because you depend on gravity for the movement of the sewage.

Q. What is the grade there, roughly? A. The elevation of the invert of the pipe, fifteen inch pipe, at manhole "B" is 216.3 and the corresponding elevation which is near the weir in manhole "A" is 216.9, giving a difference of six-tenths of a foot. 30

Q. Of a grade? A. Yes.

Q. Now I want the grade of the twelve inch sewer that serves the Corona Hotel? A. I will have to refer to another plan. I am referring now to our sewer record plans and the elevation of the twelve inch tile which runs along the lane south of Jasper between the Corona Hotel at 107th Street manhole "A," is 217.5 and at 106th Street, in the centre of 106th Street is 222.98; giving a difference of 5.48 in the distance of four hundred feet, and the Corona Hotel is just half that distance, so that the 40 sewer invert behind the Corona Hotel would be about two and three-quarter feet above the invert at manhole "A".

Q. When you speak of invert you mean the bottom of it? A. The bottom of the inside of the pipe.

Q. Now what is that? A. It is two and three-quarter feet; that would be thirty-three inches.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 35.

Albert
Walter
Haddow,
Examina-
tion.

continued.

Q. And that is as far as the sewer is concerned? A. Yes, sir.

Q. And before I forget it, is the point on the lane behind the Corona Hotel the apex of the grade of the ground between 6th and 7th Street?

A. Yes, the ground rises about the same grade as the sewer up to a point a little bit to the east of lane 106½, which would be the bottom of the "T" lane behind the Corona Hotel and from that it goes with a very much less gradient east. Referring to Exhibit 4 it is the north and south lane marked 106½ lane.

Q. Where is the apex of that ground? A. The apex would be forty-three feet east of the east boundary of that lane. 10

Q. Would you just use this plan for the purpose of getting the elevation of the sewer? Do you need it otherwise? Would it be useful to mark it as an exhibit? A. It will be all right to mark it.

Q. Do you need it again? A. Oh no.

At 12:30 Court adjourns till 2:00 p.m.

At 2:00 p.m. Court resumes.

Q. You made a report to the City Commissioners on the 3rd of March about this matter? A. Yes, sir.

Q. Copies of which my friend and myself have. And what I am going to do is to ask you to have that in front of you because it is on the basis of that report, of following that report, that I am going to ask you certain questions and allow you pretty much to explain the matter and if there are any of these figures or plans that we have here that you have seen that will enable you to illustrate your remarks please ask me for them as you go along. A. Yes. 20

Q. We have already in evidence the search for escaping gas that was made on the 22nd of February by the employees of the Gas Company—digging of the pit on the lane on the east side of 107th Street where escaping gas was found to be coming from the west; the digging of the pit on the west side of 107th where escaping gas was discovered coming from the east and the digging of a pit in the centre of the street adjoining manhole "A" where the intermediate pressure line was found to be affected and gas escaping. We have already that in evidence. We also have in evidence the fact of the running of the smoke test to which you referred in your report. So we do not need to go over that again. But incidentally to that will you be good enough to tell us what the size of these three cables are that are in the boxed conduit? Give us an idea so we will know what it is? A. There are three cables in that conduit box. They are called the negative return cables of the street railway. One of them is spoken of as 869,408 circular mils and two, 1,106,300 circular mils. A circular mil is a unit by which the area of an electrical conductor is measured and the circular mil is defined as a circle with a diameter of one mil and that is one one thousandth of an 30 40

inch. Now these conductors and their installation would be of maximum size, one and one-quarter inch or one and one-half inches in diameter.

Q. And they would be placed in what position? If you would be good enough to put a little sketch to show in what position they would be in in that boxed culvert; what is the dimensions of it, 7 x 10 or what?

A. On this plan Exhibit 28 I show 8 x 12 would be the outside dimensions of it. I have indicated to his Lordship that the three cables are lying inside that box referred to on the bottom.

10 Q. I want to get that for the purpose of getting your idea or getting an idea, mostly from you, as to what the chances would be of completely stopping that box by putting cotton waste into it? A. Well any circular cross-section has little interstices in them and you could shut it off by having a sort of plastic cement or heavy plastic clay and putting it around.

Q. But I am speaking now of part of the evidence that referred to cotton waste. Mr. Templeman said when he put in his smoke machine at that point he pulled out the vent that the gas company employees had put at the point on the plan he was referring to and he found the box culvert stuffed up by cotton waste and he took some handfuls out of it?

20 A. Well ordinary cotton waste I think apart from—I cannot say whether it was jammed right in around, but cotton waste itself, as I know it, is quite an open porous material. It is just the shredded up cotton that is used for cleaning machinery and one thing and another.

Sketch showing position of three cables, marked Exhibit 31.

Q. Now there has been evidence given here also of the smoke that was noticed in the smoke test travelling outside the box into the basement. And in that connection there has been evidence introduced here as to the nature of the backfilling material on the south wall of the basement. You understand? A. Yes.

30 Q. Will you be good enough to to tell us what you are aware from observation or otherwise of the nature of that backfilling material on the south wall, adjoining the south wall on the outside of the Corona Hotel building proper and if you want me to show you any photographs I have no doubt my friend will let me show them to you without any trouble.? A. Well along the south wall of the Corona Hotel the condition outside the basement wall with regard to backfilling, it exists in practically every large building around the City—that is when the building is being constructed the excavation is made out on the lane or out on the street in order to accommodate the outer edge of the wall
40 footings which you will understand are wider than the wall outside. That leaves a space varying from two or three feet and in some cases where the rain breaks it off it goes back some feet further and that cavity becomes filled with construction waste which includes lath, plaster, lime,

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 35.
Albert
Walter
Haddow,
Examina-
tion.
continued.

mortar, pieces of brick, pieces of wood and such things as that mixed with soil. And I had a sample of that backfilling taken from this wall which I heard given in evidence this morning and put in as an exhibit.

THE COURT: Am I correct in this, that the reason for giving this evidence is to show the possibility or probability of gas entering the hotel at this particular place that it is said to have entered?

MR. WOODS: At this place and at other places in the rear of the hotel.

THE COURT: But does it go to any other than the possibility or probability? 10

MR. WOODS: No, it does not go to the matter of construction of the pipe or welding or those things at all. It is on the main issue, to show that there was a natural gas fire, that it was in its inception a natural gas fire? A. I think we took a photograph of that back wall during the process of demolition or dismantling of the old wall, and I do not know whether—

Q. I will give you all the photographs. There are four of them there. A. Here are two photographs which will probably illustrate what I wish to say.

Q. I will put them in as an exhibit now.

**Photographs of the demolished wall of the building in question,
marked Exhibits 32 and 33.** 20

A. (Answer continued): Now in connection with my explanation of these photographs I wish to refer to a memorandum which I made on a visit on May 25th. On May 25th I made an examination of the Corona Hotel basement and at that time the rear wall had been—it was in process of demolition. Now on the lane, that is south of the rear wall this porous backfilling that I have described had sloughed off leaving the outside limit of the original excavation. Now that outside limit extended right as far as the street railway return box and the box could be seen right along the solid ground. 30

Q. You say the outside limit of the original excavation, that is the solid material? A. Yes.

Q. That extended up to the box culvert? A. Yes.

THE COURT: Which way were you looking at those two photographs Exhibits 32 and 33? A. You are standing in the basement and looking south. You see here is the lane 106½ going south and this is the fore-work of the new building that is going up and this dark line about half way between 4 and the pavement is the street railway return box and that is indicated in the same position on Exhibit 33.

Q. MR. WOODS: Now anything else in your memorandum in connection with the subject right there? A. I make this observation: "The brick masonry itself—"

MR. SMITH: Will he tell us what is there rather than reading it. A. I would like to say also that my observations at that time showed also that the back wall of the Corona Hotel basement was, I would call it, a very open brick work. That is it was not fully flushed with mortar, leaving openings between the bricks of as much as three-quarters of an inch. I would consider it a very porous wall.

10 Q. And while we are on that, you were speaking of this box culvert. Did you notice how close it came to the easterly opening on the lane that was referred to here as having formerly been used as a ventilating shaft? A. Yes, I am referring to City Engineer's Plan of February 24, 1932. I do not know whether that has been in as an exhibit yet or not.

Q. Yes, that is Exhibit 10. A. About five feet west of the southeast corner of the place marked "Auto Accessories" the conduit was tied in at two and one-half feet from the property line as you face the wall. The north face of the return box conduit was two and one-half feet from the south face of the wall.

20 Q. But I had more particular reference in my question to how close that conduit pipe at that point came to this old disused ventilating shaft which has been referred to in the evidence.

MR. SMITH: Is that plan to scale? A. Ten feet to the inch. And that scales just two and one-half feet. The box passed that thing just right up against it, right up against that little protuberance.

MR. WOODS: I was in error when I said it was not to scale. It was to scale but it did not purport to show the various things in the building. A. And I am speaking also from personal observation in that regard. It went right up against it—within an inch or so anyway.

30 Q. Now I am going on in the order of your report and for the moment, at all events, leaving out certain of the conclusions you drew from the facts you observed—we may come back to them later. I ask you to transfer your attention to the mention of two sewer explosions. I am in some doubt as to whether there has been evidence of two sewer explosions—two explosions at the manhole, up to date. I know there is evidence of the blowing out of the manhole top, once. I am not sure whether there has been evidence of it having blown out twice or not. But for the purposes of my question we will assume that there was some time during the night an explosion in the manhole or a blowing off of the manhole top, that is the manhole "A" on 107th street during the course of the fire, and that the manhole top being put back there followed another similar occurrence some little time after that. Now I want you to indicate to me what you know of the conditions as you found them on the ground. I believe you visited them the next day? A. Yes, I visited the intersection, that would be Monday the day after the fire.

40

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 35.
Albert
Walter
Haddow,
Examina-
tion.

continued.

Q. And I want you to give me your statement as to how those explosions could occur? A. I visited the 107th Street and lane south of Jasper intersection the next day, that is the Monday following the fire and at that time there was an excavation just north of this manhole "A" which exposed this group of piping including the fractured weld. Mr. Ruff the sewer foreman was with me and I sent him down into the sewer to see if there was any—to see if there had been any damage done to the manhole or to the pipes, and when he was down he called my attention just as he was passing, he called my attention to the strong sense of natural gas—it is hardly a smell, I don't know what you would call it. 10

Q. I am trying to arrange with Mr. Smith that you will be able to give this evidence without my recalling Mr. Ruff in this regard because I forgot to ask him this question. A. Mr. Ruff called my attention to what we will call it the odor, but that is not correct because it is odorless. But one can sense natural gas whether it is by the taste or not I do not know. But I know I can sense it. He called attention to that and I put my head into the manhole and I got a very distinct sense of natural gas in this manhole, which on examination I found there were two construction joints in the manhole just about three or four feet below the top, and my explanation is that during the night of the fire this manhole cover, from statements which I read, was covered with snow and ice. That is the common condition, and consequently any gas finding its way into this manhole could not escape by way of the manhole cover. 20

Q. There are vent holes? A. There are vent holes in the cover. The specific gravity of gas is less than that of air. I think it is about .6. It is lighter than air. My contention is the gas would continue to seep into this manhole and gradually fill up. This twelve inch sewer which runs along the lane to the Corona Hotel is connected with the service of the Corona Hotel. In the City of Edmonton in all sewer connections there is a vent pipe which runs to the roof of the building and it is this side of what we call the running trap. That is, it has absolutely free access to the sewer. Now during the fire there would be—the fire was I understand a very hot fire and quite a large one—there would be a very considerable up-draft of air in the whole vicinity. These soil stacks and one thing and another in the hotel would become heated by the flames and being high above the highest building around there it would create quite a strong draft up those stacks which would seek to be fed from whatever source it could which would include this sewer which rises two and one-half feet in the distance between the street and the lane. There would therefore in my opinion be a mixture of gas and air flowing through this sewer in the service and up through into the vent stacks and as the fire progressed the drainage fittings would become broken, the lead joints would become melted and the pipes would break from the traps in the wash bowls and all the rest of it would become broken, allowing the mixture of gas and air to have direct access to the flames in the fire and it would therefore ignite 30 40

and backfire along the sewer, and in my opinion it was this backfire which resulted in the two explosions referred to which blew the cover of the sewer off.

Q. This odor or taste or whatever it would be of natural gas that you noticed in that manhole in the evening of Monday when you and Mr. Ruff were there, that was when the company had found the leak and the vent was open? A. Yes. The whole excavation was open there and what I have said with regard to that would be more true in my opinion before that opening had taken place, because you will remember that the gas in this intermediate main was under a pressure of around thirty-five to forty-five and it would either build up its pressure or escape very rapidly.

Q. Thirty-five to forty-five pounds pressure to the square inch, would you describe that as a heavy pressure? I mean it would blow. I think Mr. Booth mentioned seeing it blowing the earth away? A. Yes, I saw that myself.

Q. Well it is going pretty strong? A. Oh forty pounds is a pretty substantial pressure. For example forty pounds to the square inch, to give you an idea of what it is to the square foot, multiply that by one hundred and forty-four. That would be almost three tons.

Q. Now apart from these construction joint holes was there a place that the gas from the leaking vent could get into the manhole between the manhole cover and the manhole itself? A. I do not just get that.

Q. Was the manhole cover down on the manhole itself or was there a space in which gas could go into the manhole in that way? A. I do not recall any direct observation on that point.

Q. But at all events there were construction joints? A. Yes.

Q. And from your observation of that manhole you have no doubt that natural gas had been in there? A. That was my opinion.

Q. Is there any sewer gas in quantities that accumulates in that manhole? A. We have never in all our sewers had any trouble with what is called sewer gas. We never had a single fire or explosion. The only incident I recall in that connection is a blockage in connection with one of the packing plants where two blockages occurred in a twelve or fifteen inch main and those were highly septic and generated gas, which, when our men removed the upper one released the gas between them and it burned away. That is the only case I can recall at all and it is quite almost impossible for that to happen because, as I say, every connection to our sewer system has a vent pipe to which it gives a ventilation to the sewer and those vents are acting and the sewers getting a continuous ventilation all the time.

Q. Is there a down draft in the winter time in the manhole? A. When it is covered with snow and ice I think there would be no draft at all actually through the cover, but there would be a draft up into the stacks of the Corona Hotel.

Q. Well I have in my mind something else, incidentally. But suppose there were no snow and ice there and you had those holes in the manhole

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 35.
Albert
Walter
Haddow,
Examina-
tion.
continued.

exposed, would there be a down draft? A. Yes, I believe there would be.

Q. You would not be able to smell anything at those holes in the winter time? A. If there was a strong down draft you would not—no.

Q. In connection with these explosions, the theory with respect to which you have been developing, I gather that they would be some time after the fire started? A. My theory would pre-suppose that, that is according to my theory it would be necessary for some of the drainage fittings to be broken before the gas would have direct access to the flames.

Q. And the draft that would be formed by the progress of the fire and the heat, the draft being such as you described—upwards—would not happen until after the fire had progressed for some distance? Is that right? A. I do not say that. I would say there might be a draft on these stacks even without a fire. 10

Q. Without a fire? A. Yes, because it is about the highest point right in that neighborhood.

THE COURT: Is it intended to give some evidence, whether scientific or expert or otherwise, in which it is desired to indicate a time when the break might have taken place?

MR. WOODS: Well we can only give our experts' opinion of that from the appearance of the break, so far as we are concerned, and I do not think the gas company have any—I asked Mr. Garrett about that and he says he thinks it is within twenty-four hours. There is no way of absolutely settling that. 20

THE COURT: Is it intended to give evidence, expert or otherwise, as to how long after the break took place it might have been expected, having regard to conditions, that the gas entered the Corona Hotel, if it did enter? Is it intended to try to show that?

MR. WOODS: I cannot say categorically that it is intended to show just how long it would be physically possible after a break. But I will see how far my experts go. Mr. Boomer is the man I have on gas and probably we can get something of that kind from him although I have not it in my mind. 30

THE COURT: It strikes me that, like in all cases no matter of what length, it will fall into various lines, that are capable of extending their application to a legal position.

MR. WOODS: Yes but you would have to get that and find out how long it takes to go through a culvert and everything in that nature.

Q. Now what would be the explanation of a second following explosion in the manhole "A", assuming that happened? A. My explanation would be that if the gas mixture backfired to the manhole it would then become necessary for the manhole and sewer main to fill up again before the same thing could recur. 40

Q. And how long would that take? A. Oh I really cannot say. I would not say that the backfire in every case would even go to the manhole. It is possible that there was a series of advances and retarding possibly of that backfire flame. It is not essential that it should go to the manhole. It might be cut off by surging.

Q. Would it be consistent with the theory you have expressed that another blow-up of that manhole top would follow the first one within ten minutes after the first one had blown off? A. I think so. I think it would.

10 THE COURT: Backfire from what, in the theory you are advancing?

A. I might explain that gas was escaping through the drainage system into the hotel and after the fire had been in progress for some time that the fittings would begin to be broken, that is the falling of floors and the melting of joint material would break open the drainage system and it would allow a direct in-flow of gas or gas and air mixed and then it would become an inflammable mixture and would backfire right up through the sewer.

20 Q. MR. WOODS: Has the leak from the break—it seems to be common ground—any relation to that? A. Oh yes. In my opinion it fed it by seeping into the manhole and thence along the sewer main service and thence into the hotel.

Q. You have natural gas from this break right near that manhole going into the manhole and, as you say, gradually filling up the manhole from the top? A. Yes.

Q. And that manhole is directly connected with the sewer into the hotel, which you pointed out? A. Yes.

Q. That gas goes into that sewer? A. Yes.

30 Q. It is mixed with air in the course of going into the sewer? A. Yes.

Q. As that gas follows up the sewer and goes into the sewer in the hotel some of the fittings in the bathrooms that are connected with the sewer system have melted? A. Yes.

Q. So that the gas-air mixture in the sewer comes into contact with the flames that are then present around the building and in the hotel and in that bathroom wherever it is? A. Yes.

Q. Those flames then light that gas and air mixture? A. Yes.

40 Q. And the igniting of that gas-air mixture follows back, ignites back in the sewer. You would find a fire in the sewer back-travelling right back to or near to the manhole? A. Might travel right to the manhole.

Q. THE COURT: And you say also the explosions that took place in the manhole might have happened without a fire?

A. Oh no. I said the draft.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 35.

Albert
Walter
Haddow,
Examina-
tion.

continued.

Q. MR. WOODS: He said draft in the vents?

A. Oh yes.

Q. THE COURT: Then I misunderstood you. It is the draft?

A. Oh yes.

Q. MR. WOODS: I had in mind, I thought you had to have a fire in order to have the air getting hot in going up, but you say you could have that going up in the vents without any fire? A. You might get a condition even under normal conditions, there might be a high building next to a low one and in order for that to vent sometimes it will get its ventilation down through that stack and up through the sewer into the other. 10

Q. But the main thing we are at is the explanation of this phenomenon of the manhole cover blowing off and that happening once there would have to be then another accumulation of gas in the manhole in order to have it go off again? A. Yes.

Q. And the gas in the manhole thus accumulated would be set on fire by the backfiring you have described through the sewer? A. Yes.

Q. And that might happen quite possibly ten minutes apart? A. Yes.

Q. Was there any evidence you saw on the ground there when you went there on the Monday that the pavement had been cracked by those explosions? A. There are some photographs here I have been looking at. 20

Q. Well that is just a subsidiary point? A. Well, yes. I think there are some here. The day after the fire, the Monday I was there making the inspection east of manhole "A", that is on the pavement in around just about here (indicating). There was quite a bit of cracking of the pavement which I had never seen before and which I could not explain. It is the way it appealed to me at any rate—it seemed to have some relation, but it looked that way to me, although it may not.

Q. I am going now to another part of the issue with you now and following along in your report that has to do with the laying of the twelve inch intermediate gas main itself by the gas company. You have had a good deal of experience in the laying of these sewers and mains of various kinds? A. A great deal of our work has to do with that. 30

Q. Now assuming for the purposes of my question that it has been established. The way in which this main was laid was by a tunnel under the street and not by what is known as an open cut method. You understand? A. Yes.

Q. Now have you any information from the gas company or otherwise as to how the pipes, as to whether the pipes were welded together before they were put in the trench or not? A. Well soon after the fire when I was making my report I was investigating that and trying to get information on that point and I was informed by Mr. Templeman who was right there— 40

Q. Never mind that. It is from the gas company? A. No I did not have any information from the gas company until June when they were re-laying, when they had opened out the whole intersection and were re-laying the twelve inch main and I was discussing this matter with Mr. Edgar Hill.

MR. SMITH: I do not think any of these conversations are permissible. I am objecting to this conversation. I do not know anything about it.

MR. WOODS: What—with Mr. Hill?

10 MR. SMITH: Yes.

MR. WOODS: I was certainly under the impression Mr. Haddow could give a conversation he had with Mr. Hill who is connected with the gas company to establish a fact. But I want to make the matter clear and I do not want any misapprehension in the Court's mind about the thing. Mr. Hill is here. What is the objection?

MR. SMITH: I intend to make it as clear as possible. I do not know what private conversations Mr. Hill may have had at one time or whether he may have consulted his records and Mr. Hill was in no sense our employee. I do not see how it could possibly be admissible.

20 MR. WOODS: We are quite willing to accept what Mr. Hill says as to whether that pipe was welded together before it was put through the tunnel or whether it was put through in two pieces and welded in the centre. That is the conversation he had with Mr. Haddow and he gave Mr. Haddow that information.

MR. SMITH: I will undertake to call Mr. Hill.

MR. WOODS: I would like for the purpose of getting Mr. Haddow's testimony on this important point to get the matter clear now.

THE COURT: You have not connected Mr. Hill, in the first place, and secondly there may be some circumstances that make it inadmissible.

30 MR. WOODS: Perhaps my friend will tell me before I go on. I will have to put it both ways to you because I cannot find out definitely whether the twelve inch intermediate gas main was first of all welded together, we will say in the lane, and then the whole eighty feet of pipe pulled through, or whether it was put through in two sections and joined together while it was laid on the bottom at the centre—welded together by workmen, at the centre? A. Yes.

Q. So we will have to cover both those contingencies. But it was in one way or the other, you will understand? A. I believe it was, yes.

40 Q. It was not done by an open trench being cut? A. I am quite satisfied it was put through by what you call pit and stall.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 35.
Albert
Walter
Haddow,
Examina-
tion.

continued.

Q. It has been established by your own workman, Mr. McGaffin. Now have you any method of ascertaining from your department how much paving was got out by the gas company in making these three holes of Mr. McGaffin's? A. I have searched for that, but unfortunately, sometimes when we clean out the vault—and a few years ago we cleaned out the vault and I think those records were destroyed and it happens to be that is the year that it was destroyed. Ordinarily we keep a record of the cuts and when they are billed to the various utilities or some debtor account we actually dimension the cut and give the length and breadth.

Q. And you have not anything in your possession? A. I cannot find anything on that at all. 10

MR. SMITH: You are not suggesting you dimensioned these cuts to us in this case? A. No. There may have been. I had better not say anything until I have seen your invoices. But we always measure the cuts. We have to.

Q. But you only billed us with yardage. That is our difficulty.

MR. WOODS: At all events, you were present with Mr. Ruff, were you, when the gas main, the old gas main, was taken up between the 14th and 18th of June? A. Yes, sir.

Q. And you yourself made an examination along with him of the manner in which that pipe was in that tunnel? A. Yes. 20

Q. Now will you go on from there and tell the Court what you saw and any criticism you have to make of it without my indicating anything about it? A. I am referring now to our plan of August 13th which is a blueprint of Exhibit 28.

MR. SMITH: Mr. Woods asked me if I had that plan and I said I had, and I have not.

MR. WOODS: Please explain all you know about that pipe.

A. Well first of all the intermediate pressure gas line is laid as shown on this plan and on the model, just north of the low pressure main which is the adjoining manhole and just south of the return box. That is shown on the plan portion of the plan which we are considering and is marked on the right hand side as twelve inch intermediate pressure gas main open for installation August 17, 1923. It was Saturday afternoon on June 18th, I think, that the gas company exposed the whole pipe by cutting the pavement and opening the trench across 107th Street, and this was several months after the fire. But the reason for that was, I was informed, the gas company had to wait until their heat load had passed before this could be done which was quite right, I think. On the lower portion of the plan above the title "sections obtained when the ten and twelve inch gas mains were relaid in June 19, 1932" is shown a longitudinal cross-section across 107th Street. This is a section which you would see if you stood looking north along 107th Street. Now beginning at the right hand section which would be the west side of the street referring to the cross-sec- 30 40

tion you will notice it starts in with a dresser coupling at the extreme left of the plan. Just opposite that it says "profile of the bottom of the twelve inch intermediate pressure gas main" and a little dart indicates the yellow fill line. In the blueprint of course it would not be a color. Continuing to the right there is another note says "profile of the ten inch pressure gas main invert" and there is a dart from that note pointing to a broken yellow line, which in your blueprint would appear just broken white. Just above that note there is a note "profile of the inside bottom face of the eight by twelve wooden return conduit" and a dart there indicates a filled green line. Just to the right of that appears a note "dresser coupling." Now at that dresser coupling just referred to was where the gas company disconnected their twelve inch main. That is, the portion of the main to the west of that was not disturbed on this day in June. It was relaid.

Q. Will you describe to the Court what a dresser coupling is? A. A dresser coupling is simply a sleeve which goes over two plain end pipes and this sleeve contains two rubber gaskets which when pulled together create a pressure on the pipe by the rubber gaskets which make them gas tight and the pipe by virtue of this sleeve and the opening has a certain amount of flexibility. Now just below that at the left hand edge of the hatching you will notice a note "beyond the above coupling westward it was not possible to determine the depth of the backfill." You will notice now we are underneath a filled black line on the tracing which represents the top surface of the pavement; that is the street pavement. Now at this point let me explain the scale. The scale as shown near the bottom of the plan is one inch equals two and one-half feet. Now one of those large squares or one inch square represents two and one-half feet in the plan and each of the little squares would represent one-quarter of a foot. That is one-tenth of two and one-half or three inches. Now at what is called the west property line of 107th Street you will notice that the black line which is the surface of the pavement is fifteen of those small squares, which would be forty-five inches above the bottom of the twelve inch pipe. That would be the depth of the bottom below the pavement at the west property line of 107th Street.

Q. Is this the twelve inch pipe as you found it or is it the grade of the twelve inch pipe as originally laid down? A. No, the yellow line that is shown on this plan is the grade of the twelve inch pipe as we found it on June 18th, 1932.

Q. We will come to the place later on where the departure is shown from the original grade? A. Yes, sir. Now just to the right of the words "dresser coupling" you will notice a hatched area labelled "backfill." Now the bottom of that hatched area is the bottom of the original gas trench and it shows that the bottom of the trench was, with the position of the pipe as we found it at that date at the west end six inches below the pipe and about the middle of that area almost about nine inches or eight inches.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 35.

Albert
Walter
Haddow,
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*
Plaintiffs'
Evidence

No 35.
Albert
Walter
Haddow,
Examina-
tion.
continued.

Q. Underneath the pipe? A. Yes. Now I will tell you how that was obtained. I went down myself after the old pipe had been taken out and I went along with Alan Cameron and we dug at short intervals along the bottom of the trench and agreed upon what was the bottom of the old original trench.

Q. Mr. Alan Cameron being the person who is very ably advising my friends? A. I agree with you. Now we come further to the right.

Q. Is that backfill there of the character you have been describing when you spoke of the backfill being of the character shown in these exhibits? A. Around the Corona Hotel—oh no. 10

Q. What was it? A. Oh it was soil. Well it would be, as Mr. Ruff described it to you this morning, just as you would get it off the soil bank, a mixture of black soil and clay.

Q. Plastic? A. Oh yes. It is our soil. You know our soil conditions are regular clay in our black soil. And further east you will notice a rectangular shaped marking with a note underneath it, "At this point the twelve inch intermediate pressure gas main was supported on a brick." Now at that point we discovered that there had been a brick placed under the original pipe when it was laid and we found this brick as part of the integral conditions. 20

Q. Would that be a proper sort of thing to have under a pipe of that character? A. No, I would not think so. Just a little further east is mentioned a welded joint. Now that welded joint is about sixteen and one-quarter feet—very close to that, from the dresser coupling. That would be the first welded joint east of the west disconnection. Just east of that again you will notice a note, "ten inch low pressure gas main was supported on three inch diameter blocks on the points shown," and those are indicated by two little round dots. You will notice that the ten inch main at that point was about oh, almost five or six inches above the twelve inch main. There is nothing much of interest until you get to the centre of the street opposite manhole "A." I will give you the depth there. 30

Q. That is the hatched part? A. Yes that is the hatched part. I will give you the depth there. The bottom of the old original trench just at that point would be about four and one-half feet below the pavement surface. And the backfill you will notice, there is a continuation of the hatched area underneath the twelve inch pipe, indicating the backfill above the old original excavation. Then we come to that long rectangular vertical hatched area which represents the excavated ground for the 1907 sewer construction. Just immediately to the east of that is shown the next welded joint. "This is the welded joint at which the break in the twelve inch gas main occurred." You will notice that is just to the east of that manhole excavation, that 1907 sewer construction. 40

Q. THE COURT: As I understand, this part of the plan is related to the other, this being a cross-section and the other a surface plan but you have them co-related here. A. Yes. You can get the corresponding plan

appearance by going just directly above it. We can use this and we see a long excavated hatched area which is "ditch opened during the laying of the eighteen inch tile lead for the northeast catch basin," which would be put in in 1913 when the street paving was done. And the reason it appears wider than the other is because the section, it goes across the section on an oblique angle and consequently it appears much wider although it is no wider than the one to the left. Underneath that second hatched area is this note—the elevation of the top of the above weld, that is the weld at which the fracture took place on February, 1932 was 229.41. That is when that pipe was exposed right after the fire had happened. Our instrument man recorded an elevation of 229.41. On June 18th when the pipes were re-laid we again took a shot on that and found an elevation of 229.36 indicating that in the interval between February and June there had been a further settlement of .05 of a foot which is very close to three-quarters of an inch. There is another note underneath that on June 18, 1932, the gas company raised the broken joint sufficiently to close the gap in the lower side of the twelve inch main. This necessitated the lifting of the welded joint approximately six and one-half inches. It was done in this way. I think on Mr. Hill's suggestion—and I think a good one—a man was put underneath the pipe and they had chains around it to a trestle above and the pipe was raised until the bottom end closed on the paper and the amount that he had raised in order to do that was six and one-half inches as noted on the plan.

Q. And that would be the amount that the pipe had sunk from the place from its original line? A. I would not say it would be the full six and one-half inches, but it appeared to me it would be, at least a good portion of it, that it had sunk. The pipe would sink a little bit before it would actually let go.

Q. You speak of letting go? A. I mean the fracture.

Q. Now you begin cross hatching from there on? A. From there on for the next ten squares, that would be twenty-two and one-half feet, there is a cross hatching which looks to be on an average of three inches for the June 18th position.

Q. That is backfill? A. Yes, sir. Then just east of the notes we have been referred to is this note, "At this point the twelve inch gas main was found to be resting directly on a three inch diameter circular block of wood lying in a general north and south direction." That is at right angles.

Q. That is Exhibit 26? A. Yes, sir.

Q. And while I am at that, there has been some matter suggested by Mr. Ruff as to the state of preservation of this block of wood as compared with the state of preservation of the wooden box culvert. Have you anything to say about that? A. Well I would say this, this piece of wood, Exhibit 26, had been buried, completely buried, from the time that the trench was closed until it was opened again. The wood referred to in the

*In the
Supreme
Court of
Alberta*
Plaintiffs'
Evidence
No 35.
Albert
Walter
Haddow,
Examina-
tion.
continued.

conduit box was hollow. There was air circulating in there. Moisture conditions were changing. That is it was wet and dry, which of course deteriorates wood quite rapidly especially the spruce or poplar soft woods. And then just east of the last note is another note "welded joint," which is about seventeen and three-quarter feet. That would be on the east of the welded fracture. Just east of that is another note "a three inch diameter block of wood found here supporting the ten inch gas main." Then we go to the east property line of 107th Street and we see another note "dresser coupling." And then continuing to the end of the plan there is one more length to the next dresser coupling. 10

Q. Does that profile show where the original grade—any line of the original grade? A. The original grade?

Q. Yes. A. No. This profile does not show the original grade of the twelve inch main. We know that it would be above this line that is shown here but I have no information to show exactly how much.

Q. That, then, is what this profile shows of the position in which you found that twelve inch gas main on the 18th of June when this was opened? A. Yes. I neglected to say that the street pavement comprises an inch and a half of bitulithic surface and seven and one-half inches of concrete base, a total of nine inches. 20

Q. And what would you say as to the safety of that method of laying that main?

THE COURT: I think now you had better send for Mr. Smith, who has just gone out thinking these explanations would take some time. I would like the witness to repeat what he said about this statement on the plan here "June 18, 1932, the gas company raised the broken joints sufficiently to close the cut on the lower side of the twelve inch main. This necessitated the lifting of the welded joint approximately six and one-half inches." And I understood him to say to you that he would not agree that that six and one-half inches indicated that that was the distance to which, as you suggested, the pipe had sunk from the time it was put in. But he added something which was more or less, I thought, other than an explanation of the map, which would indicate an opinion of his that that had something to do with the breaking of the joint. I think the question and answer was intended to go to that. I would like to know what it was you said. 30

MR. WOODS: Tell His Lordship. You said you would not say that that six and one-half inches was the distance to which the pipe had sunk from its original level and you went on to say to me there something else about that? A. You probably refer to this, that I think the pipe had subsided and it would subside to some distance, a certain distance, putting the lower side under stress before a fracture would actually take place. As a matter of fact the fracture, the length of the fracture, as I observed it on the day after the fire, had lengthened very considerably when I observed it on June 18th when the pipe was being re-laid. That of course 40

is consistent with our information that there was a further settlement.

Q. And I was going on to ask you as to whether that method of laying that gas pipe intermediate pressure gas main, as shown on that profile, that backfill as shown, is a safe method of laying the pipe? A. No. In my opinion there are dangerous possibilities.

Q. Just why? A. Because, as actually happened, there was subsidence, which put the pipe under stress and eventually resulted in the fracture and opening of a joint. I would like to say this, as indicated for the interval from February to June that that pipe had a Dresser coupling on it, a split Dresser, which was put on by the Gas Company until the permanent repairs could be made.

Q. When the break was discovered on the 22nd of February the Gas Company put in at that break a Dresser coupling? A. Yes.

Q. On the main. And that is the way the pipe remained until it was taken up in June and a new pipe laid down? A. Yes. Now during the interval from February to June the pipe evidently settled an additional three-quarters of an inch and the fracture lengthened, but the Dresser coupling appeared to hold it all right. There was no gas escaping as far as I could see when the pipe was re-laid in June. That is, the Dresser coupling allowed a certain flexibility at that opening.

Q. And should there have been a Dresser coupling in the centre at that weld? A. No. I would not say that. I think I can say this, though, that there should have been provision for no subsidence, which in my opinion could be obtained best by the method which was adopted of providing an uniform bearing for that pipe.

Q. What do you mean by that? A. Well a uniform bearing. Mr. Ruff explained it to you this morning. A long rigid piece of pipe laid in that method in my opinion should have had a uniform bearing throughout. That is the tunnel should have been very carefully driven particularly to grade and if there was any uneven bearing at all it could have been supported as we often do in sewer construction, with concrete filling. That is one way. I am not advocating that in this case, but that is one way in which you can get a uniform bearing when the sub-grade turns out to be unequal.

Q. A uniform bearing. I understand, means that the thing is uniformly flat at the bottom? A. A uniform bearing really—you can explain it better by saying that the soil is equally loaded or the foundation resistance to the structure is uniform throughout. Whenever there is a lack of uniformity, that is a greater loading at one part of the structure than the other, it then induces stresses in the structure.

Q. Now Mr. Ruff described the bottom of that trench as not having a uniform bearing? A. Well it is shown by my explanation of that plan. Throughout that eighty-foot length or from Dresser to Dresser it looks as if there is not much more than six or seven feet of that pipe, on June 18th, that was actually resting on the bottom of the old trench, and

*In the
Supreme
Court of
Alberta*

—
Plaintiffs'
Evidence

—
No 35.
Albert
Walter
Haddow,
Examina-
tion.

continued.

if the pipe had subsided from the time it was put in until June 18th then I believe there was none of that pipe resting on the old original trench.

Q. It would be in suspension or would there be backfill underneath?
A. It would virtually be bearing on those bricks with a certain amount of help from the backfilling that was underneath. I heard the evidence this morning. I can refer to it, I suppose?

Q. Yes. A. Spoken of as a curved impression.

Q. The impression from the pipe? A. When this pipe was taken up on the Saturday afternoon, June 18th, there was as soon as it was taken out of the trench a curved impression possibly eight inches wide. But a very significant thing in my opinion on that impression was just at the edge what you might call a little displacement—well “ears” was the word I was going to use. A word you might use is “a long pressure ridge running along each side of that little curved indentation.” In my opinion that indicated a slight displacement of that backfilling material. I might say too that in testing the backfilling material I did so with my own hands and I was able in several places to remove the backfilling material with my own hands. 10

Q. It could not have been packed very hard? A. It was not hard, no. 20

Q. Would proper laying require that that pipe be on the bottom of that? A. It would seem to me that was almost a pre-requisite of sound construction.

Q. And how would you describe then the construction you found there as to whether it was a dangerous construction? A. Well as the thing has turned out it is shown, I think, that the construction has allowed that rigid pipe to subside and put it under such strain at one of the joints that it fractured. It seems to me that is the best answer.

Q. And was that, having regard to what you found to be the way in which that pipe was laid—are you surprised that that happened? A. My opinion is that that pipe was laid in tunnel, that is pit and stall, that is there were some cuts across the pavement and a portion of the length was in the tunnel. Now whenever anything is constructed in tunnel I would think, and our experience makes me sure of it, that greater care must be taken than if you were doing it in an open trench. There is not the same liability in the driving of a tunnel that there is in the opening of an open cut with the workmen who do that kind of work. Therefore in my opinion the method—well I agree the method is quite a common one—that of tunnelling—I quite agree with that, that there could be no objection taken to that. Still I do think, once that method has been adopted there goes with it certain precautions which must be carefully observed. 30 40

Q. And were they observed in this case? A. Well it does not appear to me as though they were because the bottom of the tunnel you cannot say—the tunnel was not well done.

Q. Will you repeat your last answer? A. I mean to say the tunnel was not well done.

Q. Would the condition of that Exhibit 26 indicate to you that the ground there must have been wet? A. Yes, there is a fairly high moisture content almost continuously in our undisturbed soil and it would appear to me the condition of that would, it would indicate a constant, almost a constant ground condition within narrow limits.

Q. That would act as a preservative? A. Yes.

Q. There is no doubt there is a good deal of drainage along there?
10 A. Yes, the tunnel drains that way.

Q. I mean it drains that way towards the centre of the street?
A. At the centre of the street, the bottom of the old original tunnel, I am referring to now is about six inches below the bottom of the—about three inches below the bottom of the tunnel at the west Dresser coupling where the disconnection was made.

Q. I am now coming to another matter. I gather that the trench is—it is quite to be expected there would be moisture and wetness in that tunnel? A. Oh it has the ordinary ground content. I would not think the fact of that smoke would make any difference because capillary
20 action would easily overcome that.

THE COURT: Am I right in this impression, that I have got from your evidence so far as to your opinion as to faulty construction, the dangerous possibilities from the method adopted, that is the tunnelling method that you speak of—that your opinion is based upon what has happened, that is that this welded joint broke? You remember you used the words “as the thing has turned out the construction has allowed the rigid pipe to subside,” and so on. A. The original pipe?

Q. Is that opinion based upon this, that it was that subsidence that caused the break? A. Yes, I think.

30 Q. Is your opinion based upon that? A. Oh no.

Q. In other words, if the subsidence was caused by something else I suppose it would follow that the opinion might be different? A. Oh I would say, sir, in fairness to the Gas Company that if a subsidence, if there was a subsidence of their tunnel, if it could be shown as far as the pipe is concerned, that subsidence would have the same effect. Put the pipe under stress and if it were great enough it would cause the fracture at the weld.

Q. MR. WOODS: I am afraid I have not got that. A. His Lordship has asked whether my opinion that the break was caused by the
40 subsidence of the pipe—

Q. THE COURT: No. What I asked was this, whether I was right in the impression which I got that you were arguing from results, that is that your opinion was based on the fracture in question having been caused by the subsidence that you have spoken of which you have, as I

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 35.

Albert
Walter
Haddow,
Examina-
tion.

continued.

understood, said you might have expected from the dangerous possibility of the method used in the tunnelling? A. Yes.

Q. Am I right in getting that impression from your evidence that you are arguing from the result? A. I am arguing that the result has, as I said, supported my opinion as to the possibilities of the method.

Q. MR. WOODS: Let us see if I understand what is in His Lordship's mind. Suppose there had been no break in that weld in the middle of the street, no break at all— A. Yes.

Q. The weld had not broken as we know it did. But that the pipe had been laid in the way that we know it or you say it was laid, and it sunk in the way it had sunk, would you still say that the construction was a dangerous and bad construction? A. Undoubtedly, I would say that any pipe laid in tunnel and supported as this pipe was on a make-shift bearing and certainly poplar wood and brick cannot be considered a proper bearing for a structure of that nature. It does not follow, mind you, that all pipes constructed in that method will fracture. That does not follow because the company has many locations throughout the city where they have constructed their pipes in tunnel under pavement and as far as I am aware there have not been many failures. I do not know how many and I am not aware. But I do say it can happen and has happened and the others, well—I would say you are just inviting possible trouble. 10 20

MR. WOODS: Did I get Your Lordship's point all right?

THE COURT: I think not. However I have got his answers. I do not mind saying the impression he left with me was he was arguing from a result which might not on the evidence as we find it be found to have arisen from the thing he complains of. That is the point.

MR. WOODS: I gather from his answers to me that his evidence is not upon the result of the pipe breaking at all. It is given as an engineer.

THE COURT: I was giving him the opportunity as well as giving you the opportunity of course, to indicate what was in my mind as to what he was basing his opinion on. 30

MR. WOODS: If I am wrong in my apprehension I would like to clean it up.

THE WITNESS: I would say it is an empirical quid est demonstrandum.

Q. There is another matter and that is about the matter of this storm sewer relief which you mentioned and which has a bearing on this matter we are discussing, and you heard the evidence given by Mr. Underwood this morning who I called for the purpose of showing what the nature of that construction was and as to whether or not that construction had in any way been a contributing element in that sagging of 40

that pipe line as we know it sagged, and I wish you would take that up because it especially concerns you and give His Lordship all the information you have about it. It is a technical matter. A. I think it was the day after the fire when Mr. Garrett came in to see us and discussed the question of the 1930-31 sewer construction. I immediately saw that it was necessary then to examine that phase of the thing very carefully and I had statements prepared by the men who were directly connected with that construction and I made arrangements of an actual inspection of the conditions above that 1930-31 construction which would be as affecting it around this weir chamber. We had an opening made just on the upper corner of the weir chamber itself. First of all we had an opening made to the manhole and also to the weir chamber to get the conditions of the backfilling at these points. We actually had men go in and open those things up.

Q. MR. SMITH: This is your own observation? A. Yes. I went down afterwards and made a personal inspection of the conditions because I realized it was a point to be settled, and I will say that as a result of my personal inspection I am fully satisfied that there has been no subsidence whatever over the 1930-31 sewer construction which could possibly affect the subsidence of the gas main across 107th Street.

MR. WOODS: I would like to get a notion of how far it is from the place where that construction is? A. The distance from the top of the weir chamber, which is that protuberance, to the bottom of the intermediate pressure pipe as it was found on June 18th, is seven and one-half feet.

Q. And what did that seven and one-half feet consist of on the 21st day of February, 1932? A. Well it was brown clay and frost extended six feet eight inches from the surface and I will give you how much frozen clay there would be and how much unfrozen. The distance from the top of manhole "A" to the top side of the weir chamber is twelve feet. The frost was down from the surface six feet eight inches which is six and two-thirds feet, which would leave five and one-third feet of unfrozen material. And I said that the distance from the bottom of the twelve-inch pipe pipe to the top of the weir chamber was seven and one-half feet. Therefore there would be about one and one-sixth feet of frozen clay below the intermediate pressure pipe.

Q. And below that? A. Five and one-third feet of unfrozen clay.

Q. And had there been in that neighborhood according to your observation any sign whatever that that clay had subsided at that point or by reason of that city construction? A. No, sir, when I examined that manhole that clay was absolutely undisturbed.

Q. Now Mr. Underwood gave an explanation of the building of that extension to the manhole or weir chamber and the backfilling of it and was subjected to some examination on it. I am not sure whether you

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 35.

Albert
Walter
Haddow,
Examina-
tion.

continued.

want to make his statement in that regard any clearer than he made it?
A. Have you any suggestion as to how he made it?

Q. That is the tunnel from manhole "A" to manhole "B" was back-filled?
A. Oh I think Mr. Underwood's description of the backfilling, that is that the backfilling was followed out—

Q. MR. SMITH: Are you still speaking from personal observation now?
A. No.

Q. Then I think perhaps we should not have the evidence, My Lord.

Q. MR. WOODS: I am not pressing it. I thought it would be useful to get any explanation that would elucidate the thing. Now when you made an examination of the backfilling near the manhole "A" for the purpose you have stated did you find any other condition with relation to the gas mains that calls for comment as to the low pressure main? I notice you have here in this little picture two by six vertical sheeting?
A. There is shown on Exhibit 28 up in the upper left hand portion a cross section, a longitudinal cross section between manholes "A" and "B." And just adjoining the manhole "A" there is shown a two by six vertical sheeting erected in 1907 during the manhole construction and upon which the ten-inch low pressure main was found to be resting. That is the ten-inch low pressure main was supported directly on that sheeting. 10

Q. Well tell me what the sheeting is like. What is it? How big is it?
A. A sheeting is usually put in around an excavation in order to retain the sides of the excavation. 20

Q. What is it made of?
A. In this case two by six planks, and it stands on end.

Q. It is forced down into the earth?
A. No. What is usually done, the excavation is made and when it is down a certain distance this sheeting is put around the inside and braced so as to retain the sides.

Q. How is it braced?
A. Well two sides against each other. In a small excavation such as this manhole it goes all the way round. 30

Q. Well it is in the earth around the manhole?
A. That is shown around this plan here. There is what is called a waling. You will notice an end area and at the bottom or intermediate, as necessary, other walings are placed to keep it in position. Just as if you are taking a board fence, the waling is the two by four's that go along to nail the boards to.

Q. And it was upon that construction that the ten-inch gas main rested?
A. We found that.

MR. SMITH: By rested, do you mean came to rest?

MR. WOODS: No, on the top of it.

A. Oh, it was on the top when we found it. 40

Q. Is there any point in this other little diagram you have made here of that eight-inch reinforced concrete slab?
A. Just to the left of the manhole referred to in the upper left hand corner is a section "AA" which is just a section looking into the weir chamber from the manhole and it

shows that the side walls of the weir chamber are constructed of brick, as Mr. Underwood told you this morning, at the bottom, and the top is constructed with a reinforced concrete slab.

Q. MR. SMITH: Is it not flat on your model and flat on the plan?
A. It is flat and it runs on a slope over to the backfilling, if you will refer to the plan there.

Q. MR. WOODS: And the water flushing of the backfill in that fifteen-inch tile sewer. Can you make that any clearer? A. I heard the evidence this morning when Mr. Smith was cross-examining Mr. Underwood and I think he made a good cross-examination and probably found out some things that were not actually the case. You cannot possibly water flush a tunnel before the shaft is completed. It is a physical impossibility.

Q. The shaft. That is this thing here (indicating on model). A. Yes. What would be done and what could only be done is that this backfilling along here would be hand tamped and when you bring the backfilling up above the bar of the manhole it would be flushed and you might get a seepage of six or eight feet in through that new backfill and the water would dissipate in around the surrounding soil.

Q. And the object of the water flushing is to what? A. Water flushing is usually used in open trenches to settle it. It is an easy way of—

Q. Of tamping in? A. Yes, and quite a good way, too, a very good way, too.

Q. Did you take levels at that manhole that day to ascertain whether there was any evidence of subsidence? A. Yes, the day following the fire we took levels on manhole "A" and found no subsidence at the time the levels were taken prior to the sewer construction and also we took levels the day of the change—June 18th.

Q. And did you find any? A. No, no settlement.

Q. Now, going back to your examination of the basement and the other walls of the hotel. After the debris had been cleared away you told us you made an examination of the walls that were standing—of the basement. You will remember? A. Yes.

Q. And which wall had been most severely burned? A. The south wall.

Q. And what about the other walls? A. Well as one went around the west and north walls there was less evidence of fire which was indicated by the fact that there was places where the inside of the walls had been painted and where the paint was still intact.

Q. And that condition prevailed on all the walls towards the north?
A. The intensity of the fire results seemed to get less as you went to the north.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 35.

Albert
Walter
Haddow,
Examina-
tion.

continued.

Q. And that applied to both east and west sides of the building?
A. I cannot recall the east wall offhand. I have forgotten whether the east wall—what condition it was in. I do not recall it so well.

Q. Did you notice the brick work at the most easterly opening on the south wall—the most easterly opening is the one where the old ventilating shaft was. Did you notice anything about the brick work?

A. I remember making one inspection and making a note that that brick work was separated from the—

MR. SMITH: I think I did make an objection to evidence given of this character after the fire. Your Lordship ruled of course that the evidence should be given and I was permitted to examine about the effects of heat and I think I should make the objection now. 10

MR. WOODS: Go on and let us get the facts first. A. There had been a separation between the brick work of this so-called shaft and the main wall. I made a note at the time what that was. I do not recall it from memory. It is in one of my memoranda—I cannot find it just now and I do not just recall the amount.

Q. At all events, you did observe what, about it? A. Well in my mind it is something in the order of a quarter of an inch.

Q. A separation from the brick wall? A. Yes. 20

Q. And my friend has mentioned the fact that the heat of the fire would have some effect upon bricks and cracking them to some extent. Would you say that that opening that you there saw had been there before the fire or that it was increased during the fire, or have you any opinion? A. Oh no, I could not give you any good evidence of that. I noted that was the condition but I do not know whether that crack was there previously or not.

Q. And you did also I believe make an examination or test after the fire with steam? A. Yes.

Q. Through that box culvert? Did you? A. Yes. 30

Q. When was that and what did you do it for and what was the result? A. That is what we called our hissing test.

Q. It was to see whether you could get any hissing sound? A. I had heard a lot about this hissing business and I wanted to see what there was, so we took our thawing boiler. These are the ones you see going around the streets in the spring thawing out the catch basins, and I took it down to the corner of 107th Street and the lane south of Jasper on the night of April 13, 1932. I was not there personally. This is a memorandum.

MR. SMITH: Well you need not tell us about it. 40

MR. WOODS: Was it Mr. Ruff? A. Yes, Mr. Ruff was there and gave me the report which I recorded, but I was not there personally.

No. 36.

Evidence of William Ruff (recalled).

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

WILLIAM RUFF (recalled), examined by Mr. Woods, testified:

Q. Mr. Haddow had got to a part of his narrative in which he was telling us of a test that was made to ascertain as much as could be ascertained about this hissing sound. Did you do that? A. Yes, sir.

Q. What happened and when was it done and under what circumstances? A. It was on the night of April 13th. We took one of our steam boilers up there. There was the engineer, myself, Mr. Ward and
10 Mr. Booth I think were there. We opened four holes in the street railway return box to see. They were four of the six holes.

Q. We had better identify them as— A. One, three, four and six.

Q. And one was right at the break? A. At manhole "A."

Q. And identifying this by reference to this Exhibit 18? A. This is what I call number one on manhole "A." Number two is at the east line of 107th Street. Number three would be at the west property line of the Corona Hotel, and number four was at the east line of the Corona Hotel.

Q. They are not the same numbers as here? A. No.

Q. One is numbered one on Exhibit 18? A. Yes—one, three, four
20 and six.

Q. The four holes are one, three, four and six as indicated in Exhibit 18? A. Yes.

Q. And having done that what did you do? A. We applied steam in hole number one with seventy-five pounds pressure. The steam travelled all the way through to number four hole. It did not travel through to number six but I would say that was due to condensation. The steam had cooled off by the time it got to number four. A hissing sound was heard at each hole through to number six. But there was no hissing sound heard in the basement, which I could say was due to different conditions
30 than at the time the fire took place.

Q. It was open then? A. Everything was open at this time.

Q. Quiet? A. Yes, everything was quiet.

Q. What would the difference make of a closed cellar? A. Well the cellar was boxed in tight and the ground was frozen and if there was any sound at all they would certainly hear it in the basement.

Q. Would you say that the conditions for conducting 'sound were better on the night of the fire than on this night? A. Yes, I think they were.

No. 36.
William
Ruff
(Recalled)
Examina-
tion.

No. 37.

Evidence of Albert Walter Haddow (recalled).

ALBERT WALTER HADDOW (recalled), was examined by Mr. Woods and testified:

Q. Was the ground at the back of the hotel along the south wall, the part you have been describing as the backfill, would it be frozen ground on February 21st? A. No, there would be—our indications the next four days or three days when we were tying in was it was not. There was at least a foot of unfrozen ground. This backfilling material from the wall was unfrozen and the reason for that, that is quite a common thing you find too. These large buildings with deep basements as a rule especially when you get near the furnace room there is quite a transfer of heat and this kind of material, which is very low in moisture content, does not freeze very readily and the result is we often get unfrozen material. 10

Q. When you speak of a foot do you mean a foot south? A. Yes, even right under the pavement.

Q. And going down as far as the wall went? A. Yes, the line of frost would start say a foot. There is no absolute line because in that material it stops within a foot and it would work off away from the wall at say five feet or whatever it was—it would go off flat and there would not be any frost. 20

Q. But it is south of the wall on the horizontal? A. Yes, and would increase as you went down.

At 4:30 Court adjourns till 10:00 a.m.,
Monday, January 22, 1934.

Monday, January 22, 1934,
Court resumes at 10:00 a.m.

No. 38

**Further Extracts from the Examination for Discovery of Julian Garrett,
Manager of the Defendant. 30**

MR. WOODS: The questions and answers of Mr. Garrett's examination for discovery that I desire to put in, in order to release a witness—I spoke to my friend about it—I read as follows: 819 to 826 and following on with 927 and 928:

"819 Q. Now, in paragraph 28 of your Company's Defence, it is alternatively alleged that the escape of gas resulted from a break in the defendant's pipe or main which was caused by an explosion in the sewers

of the City of Edmonton in the vicinity of the said pipe or main. Now was there an explosion in the sewers of the City of Edmonton in the vicinity of the pipe or main, Mr. Garrett?

"A. I am informed that there was.

"820. Q. And was there more than one? A. Yes.

"821. Q. How many? A. Two, I believe.

"822. Q. Do you remember about what time? A. Well, I think the first explosion occurred anywhere from 11:15 to 11:25, on the night of February 21st.

10 "823. Q. And the second one? A. The second one was perhaps five minutes later, and the third one shortly after that.

"824. Q. They followed in rapid succession, did they? A. Five minutes or so after each other.

"825. Q. And which was the most violent of them? A. I don't know.

"826. Q. What is your information on that? Was one louder, or a bigger explosion than the other? A. I haven't any information as to the violence of them."

20 "927. Q. What city sewers do you refer to there? The twelve-inch sewer? A. I believe there were two explosions in this manhole marked 'A,' and one in the manhole near the letter 'B.'

"928. Q. And were the first two in 'A,' and the third one in 'B,' or what was the order? A. I think you are correct, that the first two were in 'A,' and the third one in 'B'."

MR. WOODS: I have a witness here who was on the manhole cover and he puts it at about 11:00 o'clock.

No. 39.

Evidence of Albert Walter Haddow (recalled).

ALBERT WALTER HADDOW (recalled), was examined by Mr. Woods and testified:

30 Q. I had intended to have you explain to the Court the operation of the smoke machine more fully than Mr. Ruff did and inasmuch as it is here I was going to have it marked as an Exhibit.

Smoke machine marked Exhibit 34.

Q. Will you explain to the Court the operation of that machine and while doing so explain what purpose there was in this machine and why the smoke test as he has described it with the ends plugged up at the time he was looking to see whether the smoke came out of the box and came up the holes would throw light upon the question as to whether the gas in the box—going through the box—would escape from the box

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 38.

Further
Extracts
from the
Examina-
tion for
Discovery
of Julian
Garrett,
Manager
of the
Defendant,
January
22nd
1934.

No. 39.

Albert
Walter
Haddow
(Recalled)
Examina-
tion.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.

Albert
Walter
Haddow
(Recalled)
Examina-
tion.

continued.

when the box was not plugged up and the gas was going through. A. This is what is known as a smoke testing machine. The smoke test is a test to determine whether or not plumbing installations are tight and it is usually passed by plumbers and building inspectors for accepting the plumbing of a house. This machine is essentially a small bevel worked by that handle (indicating). The air is pumped into the chamber on the right and you put something like oakum into this chamber and set fire to it and it burns with a slow smouldering action and there is a jacket around the small one. The water is put in the angular space between the cylindrical container and there would be about eight inches of water there which would be five and one-half inches above the pipe. Then there is a cover which acts like a gasometer cover which rises slightly. It cannot rise through the water sill. The smoke that is created comes out through the pipe on the end beside the bellows. The maximum pressure which can be created in this machine is about three ounces above atmospheric. It is limited by the depth of the water sill. 10

Q. What is atmospheric— A. That is the pressure we are standing in now. I spoke of that as opposed to absolute pressure. That is a perfect vacuum. Now this machine it is quite obvious for its size and construction, it simply has a very small capacity. If you held your hand at the outlet pipe you can just feel more or less of a breath, that is you cannot work up a pressure. It simply breathes into the system that you are testing. Now in this case the test was carried on by Mr. Templeman, and Mr. Ruff has been describing it fully to the Court and I believe you want information as to why the smoke did not come out when it was not plugged? 20

Q. What I am interested in, Mr. Ruff has described the matter in this way—he said they first sent the smoke through from one section to another, that is where the holes had been made. And in order to find whether it was leaking out of the conduit box they plugged the conduit box on the west side of each of the apertures on the pavement and they did the smoke test and the smoke came out as he has described. A. Well first of all it occurred to me to put on the smoke test because after the fracture had been exposed on the twelve inch main on 7th Street and the lane south of Jasper it seemed necessary to establish if there was any path which it would have to take to get into the hotel building. Well a similar substance seemed to be the obvious way of making this test and I just left it in the hands of Mr. Ruff to have such a test made and with the co-operation of Mr. Templeman they made it. They followed the path of the conduit box through to the hotel and the test indicated to our minds that the smoke from this machine was able to seep into the hotel basement by way of the backfilling adjoining the wall and also by way of what has been called the ventilating shaft where the conduit pipe— 30 40

MR. SMITH: Is this your own observation? A. No, Mr. Smith. It is the result of the test—of the evidence.

Q. MR. SMITH: Now you are misquoting the evidence. The evidence given by Mr. Ruff or by any of the witnesses was, as I recollect, that the only place of entry of the smoke was at the sides of the ventilating shaft. That is the only place it entered the hotel. That is my memory of the evidence so far.

MR. WOODS: But I do not understand Mr. Haddow—

MR. SMITH: He said that it not only entered it by the ventilating shaft but also at the sides. I think he is misquoting the evidence.

10 THE WITNESS: To be more precise, I should say it left the conduit box and went through the backfilling. We will leave it there from my point of view.

MR. WOODS: I gather from what you say that gas will go where smoke will go? A. That is a general statement, yes.

Q. And how would it show that the gas would escape from the conduit box when in the one case the conduit box was plugged at the time of the smoke test and in the other case there was no plug? A. In my opinion it would be the question of the quantities travelling as a result of this machine that we have just described. As I say we might call it breathed.

20 Q. No pressure? A. No pressure at all. The capacity is very very limited. I understand that the quantities of gas escaping from the fracture were very considerable. They escaped as forty pound gas and would extend about four times to four ounce gas so that there is a very considerable difference in the quantities of gas and in my opinion on account of it running uphill from the fracture a matter of two and one-half feet and running to practically a summit it flattened off very rapidly. If there was any escape possibly at that point I think the gas would follow that up through the box.

30 THE COURT: As I understand, Mr. Woods wants to know the difference in action by reason of the plugging and no plugging. Is that it?

MR. WOODS: Yes, what I am laboring to get at is this, you plug up an aperture like that conduit box and you put smoke into it in this way? A. Yes.

Q. Well if the smoke goes on for a long long while it gets choked up and if the only way out is through the cracks, naturally that is the only way it would go. A. Well it is limited in the scope of its operation, you might say.

40 Q. You say this merely breathes out. It does not come out under any pressure at all? A. No.

Q. And it seeps in that way into the conduit box and goes on until it finally comes up against a plug? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.
Albert
Walter
Haddow
(Recalled)
Examina-
tion.

continued.

Q. And the smoke still goes on being breathed into the conduit box? What will be the usefulness in that test in showing gas would go down there? A. I think the usefulness is that even under the conditions under which the test was made if the very small amount of smoke which, you might call it wisps, went through—if there were considerable quantities of gas travelling there should not be any difficulty in the gas coming out with no plug at all. That would be my idea at any rate.

Q. Will you explain to the Court also what the action of frost in the ground would be? We have it that this pipe across 107th Street, the gas company's twelve inch main, was in the frost line; was in the part of the earth that was frozen. And I want to get from you what the action of that frost would be in connection with the contraction of the pipe and the stresses on it? A. Frost action is under our conditions here an exceedingly powerful agent and I would say in a structure such as the gas line that we are discussing, would have possibly two actions. Now the first one is what might be called a jacking action. I am speaking of jacking like the ordinary well known instrument for raising heavy loads. The frost action would act in this way judging from our experience and results. Frost goes in from the surface of the ground, and penetrates according to severity of the weather, and the active action of the frost takes place at what we call like the 32 degrees—that is just at the frozen bond and that is the severest action and the expansion—it has an expansive force. When frost starts down from the surface it exerts that force and it moves whatever is most easily moved. When it first starts on the surface say at manhole "A" here, if there is any moisture at all, we will say first of all under the surface of the pavement we often have results of it forcing up the services. The surface of the pavement will be forced sometimes off the base. Going down further we often have a case of the moisture underneath the base itself forcing the pavement up above the manhole. That is a very common thing with us and sometimes will result in a movement of the pavement of four inches or more. Then as the frost continues to go down that expansive action takes place on what you might call the bottom surface of the frost casing. As soon as it gets some depth you begin to get a frozen crust of surface. In this case it is almost four feet thick when this advancing frost comes into contact with the service pipe. At that time this frost crust has become structurally very rigid. That is the whole surface of the ground is like a re-inforced concrete slab and is able to resist very very heavy pressure and the expansive force still continues and in my opinion would have a pressing effect upon anything it is coming into contact with because its reaction would be taken by the pavement which of course could not move and that would have the effect of pressing down on any of these things that happened to be in its path. Now that is a very very powerful agent as I have explained.

Take for example our street railway system. In 1919 and subsequent years we must have had ten miles of contract, the gauge slabs lifted off by action such as I have described, actually lifting the gauge slab off to the point where it interfered with the operation of the cars. And we also have the example there in deep constructions and there are many other actions. Now the second type of action that we have come in contact with is it goes in an axial way. It acts along the pipe. As the temperature of any substance drops there is contraction takes place and if that body is free to move there are practically no stresses induced in the structure at all apart from a little bit of weight and friction.

10 But if those ends are restrained, that is if the body is restrained and cannot move it induces exceedingly heavy stresses in the structure. Those stresses are equal to the force which it would take to deform that structure by an equivalent amount. Now in this particular case what you might call the rigid portion of the gas pipe is about eighty feet in length and that would have a movement within the range of temperatures to which it is subjected to about a third of an inch or about a .37 I think. I calculated, that is a little over a third of an inch.

Q. What is that? A. The difference in length between the pipe at

20 the highest temperature and the lowest temperature just in that length would be a third of an inch. Now you can easily understand that in order to make that difference in the length of pipe by actual pressure would require a tremendous force to be exerted. Now I have calculated that for a difference in temperature of sixty degrees that stress is developed—the extra stresses would come to—it would be about 11,700 pounds per square inch that is for a sixty degree drop. Now that is not an unusual drop when you consider that the neutral temperature of the pipe is about forty degrees above zero and it is possible for the temperature to drop to twenty below. That is a sixty degree drop. Now the drop for any

30 other temperatures would be proportional to that. For example a thirty degree drop. Now I am citing that as an example of frost action and I am basing that on our experience in the city here particularly dealing with the street railway construction. In our street railway construction we use what we call the continuous rail, that is the joints are welded by what is called the thermid process so that any change in length due to expansion or contraction has to be taken up in the stresses of the rail.

Q. The rail has to be strong enough to stand it? A. Yes, the rail in summer time is in compression and in winter time it is tension. I might cite an experience of five or six years back. We had a spell of

40 severe weather dropping as low as fifty degrees and on 102nd Avenue and 97th Street we had all four rails let go and they jumped apart two and one-half inches. At that point on examination we found what we thought to be the reason was that we had cut off the lips of the rail with a torch, that is in order to allow water to get into the trap box and we had weakened the rail to begin with by taking off that much metal and had in addition

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.
Albert
Walter
Haddow
(Recalled)
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.

Albert
Walter
Haddow
(Recalled)
Examina-
tion.

continued.

induced internal stresses in the rail. At any rate, that was the result of that contraction, the rails were not strong enough to withstand the axial stress developed by contraction.

Q. And we have had some evidence here as to the ground in the neighborhood of 107th Street, at the place where these pipes crossed, being moist. Would that correspond with your experience? A. Yes. Our ground practically altogether, I am speaking of clay, has quite a high moisture content.

Q. Did you observe any heaving in the pavement at that point during the time we are mentioning, in fact in the winter, which would indicate the frost action? A. Yes, yes. I noticed with regard to right at the manhole "A" I noticed the pavement itself had been heaved above the top of the manhole probably an inch and I noticed also that just east of manhole "A" between manhole "A" and the east property line that the sheeting, some 2 x 6 sheeting, was actually being heaved right through the pavement. 10

Q. How would the draft be at these holes in the winter? A. It would be an indraft to the sewer.

Q. That is down? A. Yes.

Q. And in the summer I suppose it would be the opposite? A. In the summer time there is a tendency to be the opposite because the temperature of the inside and outside air is reversed. 20

Q. Now for the purposes of my questions I am going to ask you, I am producing a photograph which will be identified with the subsequent witness's testimony. That is a picture of the gas supply pipe coming into the south wall of the Corona Hotel, the gas supply pipe, being the pipe that supplies such gas as the hotel uses in the kitchen and in some other fittings. Do you remember seeing that in the south wall? A. I remember seeing it the day after the fire when I was down in the basement looking around and—

Q. That is a pretty good photograph of it? A. Yes, I recognize it. 30

MR. SMITH: My friend is putting in a photograph, running through the south wall of the Corona Hotel building and taken after the fire. I want to make the objection I have made previously with respect to evidence of this kind.

THE COURT: You are not objecting to the photograph as a photograph of what it purports to be?

MR. SMITH: I will take my friend's word for it.

THE COURT: Well then we will take it as an Exhibit.

MR. SMITH: I think I should do that to expedite things if I can.

**Photograph of gas supply pipe entering wall of Corona Hotel,
marked Exhibit 35. 40**

Q. MR. WOODS: And in connection what that I am putting in another photograph showing the relative position of that gas supply pipe? A. Yes.

Photograph showing relative position of gas supply pipe, marked Exhibit 36.

Q. MR. SMITH: Can you tell me the size of the service pipe? A. No I cannot.

Q. MR. WOODS: Referring to Exhibit 36. This wall here—

THE COURT: It is a picture of part of the basement?

MR. WOODS: Yes. This is the west wall of the building.

10 THE COURT: Yes, that is a simple answer to my question, what I thought it was.

MR. WOODS: And I have a photograph here Exhibit 25 and at the time you will see this is a picture showing the debris there and the condition of the basement after the fire. What is that thing there that is at the bottom, I mean that pipe? A. It is called a Y junction of a drainage pipe. It is part of the drainage system of the hotel. It might be one of the main branches to the floors, but it is a drainage fitting.

Q. And that is where the sewer comes? A. Yes, that is directly connected with the sewer.

20 Q. Having regard to the evidence you have given to the Court, what would you say as to the likelihood of gas escaping from the break in the twelve-inch main that we have evidence of, that is the welded joint, and travelling along the box culvert to the rear of the hotel building? A. I think that is the obvious course that the gas took or at least a good part of it.

Q. And what would you say as to that gas escaping from that box culvert into the ground, between the box and the south wall of the building? A. I would say it would be a very simple matter because the conduit box was quite open and backfilling quite porous.

30 Q. And what would you say as to the gas in the box escaping from that box into the dis-used ventilating shaft or into any cracks between the wall of that dis-used ventilating shaft and the ground surrounding it? A. My examination showed that was easily possible.

Q. And what would you say as to the gas that was so escaping percolating through the material you found between the box culvert and the building? A. Well I would say that is possible.

Q. And what would you say as to the likelihood of it? A. Well I did it myself. I took the material over here in the bags as an exhibit and actually had our men pass gas through it, at the master mechanic's.

40 Q. And what would you say as to the gas going in this way, would it enter the basement of the Corona Hotel through that south wall you have given evidence about? A. I think it is quite possible to do so and I think it did.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.

Albert
Walter
Hadow
(Recalled)
Examina-
tion.

continued.

Q. Now can you give us some estimate, remembering that at the time the gas pipe was taken up, the cracked part, the break at the weld, had increased from the time it was discovered on the 22nd of February, it was found on the 22nd of February—I think the estimate given was something like six inches and when the pipe was taken up, I cannot remember the exact amount but it was more than that. There has been evidence given that the break was more than that. But keeping that in mind, and I have the statement somewhere and I will get it as soon as the expert is here, as to the amount of gas that was escaping from that pipe in June when the pipe was taken up. There was a test made there, or do you remember? A. I remember the test. The gas company I think ran a test shortly after the fire, if I am not mistaken. 10

Q. As to how much gas was going through? A. Yes, I think so. I am speaking from memory, but it is my information that after the split dresser coupling was put on after the fracture a discharge test was made soon after. I have not the reading, of course.

Q. But can you give us on an assumption, such assumption as you think will illustrate the matter, how long it would take for that gas to travel from that split weld up that box culvert through the sides of it, percolate through the ground and into the basement of the building? Figure it out on an assumption such as you think it is fair to make in the meantime. A. I will assume there were fifty cubic feet of forty-five pound gas escaping. The volume of that in four ounce gas would be approximately two hundred cubic feet. The inside of the little conduit is six by eight, that is the inside dimensions. That is forty-eight square inches or one-third of a square foot. Now another assumption is to be made here. Now assume that only a quarter of the escaping gas found its way in an easterly direction in the conduit; that would be fifty cubic feet. Well, that fifty cubic feet then would fill one hundred and fifty cubic feet of the conduit box in a minute. So that taking the, allowing for leakage and other factors, I believe that if the fracture began to discharge at that rate I believe that gas leaving the fracture could find its way into the hotel in less than five minutes. 20 30

Q. And you are giving that general estimate and it covers both, whether it went in by way of percolating through the ground and through the wall or going right into the dis-used ventilating shaft? A. Yes.

THE COURT: You were starting to ask something—I don't know whether it was relating to this or not—but you were going to ask about the increase in the break, of the weld. 40

MR. WOODS: I was under a misapprehension. I thought this test was made in June but from what Mr. Haddow now tells me it was made right after the fracture, so that we do not need to take into account the increase in the break for the purpose of getting the volume of gas going in. We will get that later from the figures agreed on.

Q. This assumption you have made in the meantime is on the basis of— A. Fifty feet of four-ounce gas going up the conduit, in a minute.

Q. And a quarter of that going east? A. No, that is the amount going east. That is purely an assumption.

Q. You say on those assumptions five minutes after the break occurred the gas might enter the building? A. Yes.

Q. MR. WOODS: It might be within five minutes? A. Yes.

Q. You do not want to cut it down to two minutes? A. Oh no, because that is assuming this discharge at that rate.

10 Q. And if that gas did go in the way you have described it and if it became mixed with air so as to make an inflammable mixture of gas and air and if it became lit after entering the basement in what part of the basement would you expect to find evidence of the resulting fire? A. I would expect to find it on the ceiling of whatever room it was in because gas is only about six-tenths the specific gravity of air and rises to the ceiling.

Q. Now if the resulting fire from the gas being lit continued to be fed by escaping gas would you expect to find the circumstances occurring that have been mentioned in the evidence of the fire being put out
20 and recurring at the same place?

MR. SMITH: I am going to enter an objection here. My friend has called Mr. Haddow as a civil engineer. No doubt he has a very fine standing and great capacity, but I am objecting that any qualifications given so far to have him become an expert on gases, and I object to the form of the question and he simply says in blank form "having heard what you have" and when the evidence is so contradictory it would be difficult for him to base an opinion, and I would ask which evidence he picks out and which he discards and so on.

30 THE COURT: I suppose you have not really qualified this witness. I think you had better qualify his training as to show whether he is competent to give an opinion and then I suppose you will indicate the hypothesis upon which he gives the opinion.

MR. WOODS: My question is directed on the assumption that there is evidence before the Court that fires in various places were seen and put out and that they recurred in various places. We will assume there is evidence of that before the Court. Would your experience be such as to say that you could give an expression of your opinion as to whether you would expect that circumstance to occur if there was a fire there that would be continually fed with this gas as you have described?
40 A. Well I think—

THE COURT: Is this a matter upon which you feel yourself capable of giving an opinion? You always have in mind that element of fairness which has sometimes been attributed to you? A. Thank you, sir.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.
Albert
Walter
Haddow
(Recalled)
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.

Albert
Walter
Haddow
(Recalled)
Examina-
tion.
continued.

Q. And what Mr. Woods wants to know now is whether you are qualified to give the opinion he desires to get. Your qualification first—
A. Well let me state what I assume to be the problem if you wish to put it that way, that is that gas is being fed into a certain location and is ignited, then is put out and is continued to be fed and whether or not there is a possibility of it igniting again.

THE COURT: Well it is hardly that.

MR. SMITH: I will admit that.

MR. WOODS: Would you expect to find the phenomenon we have in evidence from the continued presence of gas as we have it described? 10
Is that the thing one would expect to find under such circumstances? I do not think these experts can tell that as well as Mr. Haddow.

THE COURT: I take it that Mr. Smith's admission goes to this, that the Court might think that might happen without expert evidence being given, and I understand his admission is that it does happen.

Q. MR. WOODS: Now assume for the purpose of the answer to these questions there is evidence before the Court of three places especially where that recurrence of gas flame occurred; one of them is at the south wall of the building on the outside of the south wall and between the south wall and the pavement in the lane—a crack or 20
aperture. Another of them is at this place on Exhibit 36 which is below the platform of the basement stairs—the under side of the platform of the basement stairs. And the other is on the south wall of the kitchen of the Corona Hotel. Do you see? A. Yes.

Q. And assume that the evidence is, as it is, that there is a brick wall—the south wall of the Corona Hotel was a brick wall? A. Yes.

Q. And that in the kitchen the construction is a lath and plaster wall inside the brick wall? A. Yes.

Q. And from this photograph that you see here, we will assume it is proved to be correct, that that kitchen is just above that west wall. Do 30
you observe? A. Yes.

Q. And that the concrete floor of the kitchen is as shown there. Do you see that concrete floor at that place? A. Yes.

Q. And you see the condition in which I am assuming the construction of that building is. Do you see what I mean? A. Yes.

Q. And keeping in mind this Exhibit 35, shown also on Exhibit 36 where the gas pipe enters the building. Now keep this evidence in mind and keep in mind also that you have, as I say, evidence of recurrence of that flame on the south wall between there and the pavement under-
neath that stair platform—is that other place, and the other is on the 40
south wall of the kitchen? A. Yes.

Q. Now what would you say as to where that gas likely came from and as to the likelihood of that happening and of the phenomenon recurring that I have told you of at those three places. Where would the

gas come from and what would you say as to the departure? A. My opinion is that the gas could come through the street railway return conduit box through the backfilling adjoining the south basement of the wall outside and, referring to Exhibit 36, certainly could find its way around the angular space between the gas service line and the brick wall and once in the basement it would rise on account of its buoyancy. It would have to have access through cracks or openings or something through the ceiling and the wall and if there is a space between the brick wall and the lath and plaster it would undoubtedly get into that
 10 through buoyancy.

Q. And if that gas were lit the flame would immediately follow along the gas? A. Yes.

Q. Suppose the gas escaping at the basement became ignited? A. Yes. The combustion would proceed as long as there was fuel to feed it.

Q. Yes. It would not take any time? A. No.

THE COURT: The same as if you light the gas in the burner of your stove. You do not put your match at each little hole, do you?
 A. No.

Q. MR. WOODS: And what about the gas on the south wall of the
 20 building between the cracks and the lane? A. The same explanation would apply there. I am assuming that gas has followed the street railway return box and left the box through cracks in the box itself and has gone through the backfilling which is shown in one of the exhibits, and some of that gas has evidently risen in that backfilling to the underside of the pavement and found its way in between the crack and the pavement and the south wall of the building and it would become ignited by coming into contact with some flame.

Q. And I suppose as to the flame that was put out from time to time under the basement platform that would be kept— A. I did not
 30 hear the evidence but that would be a probable explanation of it.

Q. And what is the general color of these gas flames ordinarily?
 A. Well gas flames—a gas flame may vary in color from yellow to blue, depending on the air of combustion. With no air of combustion it is a yellow dullness, but with air of combustion it is a yellow bluish.

Q. And would the color as described by the witnesses lead to any conclusion? A. There would be plenty of air of combustion in the open air. I think it would yield a blue flame.

Q. And would the fact of the continuance of these flames after the gas services into the hotel had been turned off lead to any conclusion?
 40 A. I think the conclusion there is that if the services had been turned off then the services could not be the source of supply of gas getting into the flames. It must be from some other source.

MR. WOODS: As far as I know that is all I desire to ask the witness just now. I may have overlooked some little thing.

*In the
 Supreme
 Court of
 Alberta*

Plaintiffs'
 Evidence

No 39.

Albert
 Walter
 Haddow
 (Recalled)
 Examination.

continued.

CROSS-EXAMINATION BY MR. SMITH.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.
Albert
Walter
Haddow
Cross-Ex-
amination

Q. We may as well start where my friend finished. What point in the mixture of gas and air will gas burn? A. I did not get that.

Q. What are the proportion of mixtures of gas and air which will cause it to burn with a blue flame? A. The complete combustion of gas is accomplished with between nine and ten volumes of air in relation to the gas.

Q. To one? A. Yes, to one. Of course the ten of that you will recall the nitrogen content is inert. It is just the oxygen.

Q. And I am saying to you that there is no doubt if you had a tube similar to this plan which I am holding in my hand Exhibit 5, and there were a tube from which natural gas were coming and I light it at the top and burning in the open air it would burn with yellow flame and no blue about it? A. Not altogether. 10

Q. Let us take a Bunsen burner and you cut off the air. You get a yellow flame? A. Yes but that is not my assumption that the air is cut out from the bottom.

Q. I am saying that I have this tube in my hand feeding pure gas—I get a yellow flame? A. Yes if you cut off the air you do.

Q. And I have to get a burning mixture of ten to one in order to get my best blue flame? A. Complete combustion, yes. 20

Q. Take a cookstove. I have tried it several times. A. Yes. If you have not sufficient air you have gas.

Q. And now we have gas coming through this ground that you have described, coming through this fill and it reaches the air? A. Yes.

Q. Do you believe it possible under these circumstances to pick up a ten to one combination of gas and air? A. I think it already had it.

Q. From where? A. Well are we together on assuming that the mixture is coming along the conduit pipe?

Q. Yes. A. Well this conduit pipe is open to an air supply and I think the gas would get its requisite air before it came into the ignition. 30

Q. Then you can assume that it gathered in its journey just the right amount of air to make a blue flame? A. I think it would vary. No doubt there would be surging of the mixture. I would not say the mixture would be a correct one at all times.

Q. And the color of a flame is also affected by many other things such as dust? A. Yes. Dust gives you the effect of sparkles.

Q. It depends on what kind of dust? A. Yes. If you are referring now to your blow pipe—it depends on the mineral.

Q. And the colouration is affected by smoke, looking through smoke toward a burning object. You may remember an explosion down the Crows Nest Pass a few years ago and we had some eminent gentlemen explaining these things to us as to what they thought they saw and did not see. Do you remember? A. I am not familiar with the Crows Nest. 40

Q. Are you familiar with the effect of dust and smoke to one's vision? A. I am speaking, you know, as everybody has been in dust and smoke. I would say that smoke undoubtedly cuts down your vision.

Q. Now I want to ask you about some general problems. And I suggest to you that in 1923 and now it was and is good practice to lay gas lines within the frost line? A. Yes, I agree with you. But please let me say you are making that general statement but I think you can hardly make it without qualification. I think you are quite right in saying you can lay gas mains in a frost jacket. But it seems to me you
10 cannot lay a rigid pipe in a frost jacket, that is for any distance.

Q. What I am saying is this, that you will agree that if properly laid it is a proper practice? A. I agree with that.

Q. And a universal practice to lay gas lines within the frost? A. I agree with that fully.

Q. You are referring to natural gas? A. Yes.

Q. And you cannot do it with the artificial gas because we have moisture? A. Yes.

Q. And I suppose you will agree with me that it was good practice in 1923 and it still is good practice now to construct gas lines of welded
20 pipe if provision is made in some other way for expansion and contraction? A. That is what I am saying, that provision must be made within limited distances for expansion and contraction.

Q. And I suppose you will also agree with me that the City did the paving for the company after it opened the Edmonton streets to cross the paved streets? A. Yes that is correct.

Q. And I suppose you will also agree with me that an arrangement was made with you to backfill these places across streets and that the company paid you considerable money for so doing? A. No. The arrangement we made with the company was for the restoration of the
30 pavement only. Our duty as I see it ended with the restoration.

Q. Perhaps I had better recall the circumstances I had in mind. In making this suggestion to you there is no doubt of course that a gas line should not be completely backfilled before it is tested? A. No. It should not. If it is possible to leave a gas main opened until such time as it is tested it certainly facilitates the discovery and repair of leaks.

Q. And there is no doubt at all that these lines in the city were not completely backfilled until after tests were made? A. No. The practice varied. It depended.

Q. Take this particular place. You heard Mr. McGaffin say he
40 found this line partially filled and someone gives evidence of a leak on the other side of the street? A. Yes.

Q. So there was nothing wrong with the work of the contractor? A. I understood Mr. McGaffin to say that that main had been completed and turned over to us for pavement repair.

Q. Let us get this right? A. It seems to me one would hardly

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.
Albert
Walter
Haddow
Cross-Ex-
amination
continued.

attempt to restore the pavement before the backfilling is completed because that would make it—we have agreed that the test is better done before the backfilling, and it seems to me you can go even further and say it is better done before you restore the pavement.

Q. And what would be done in order to restore traffic, that is the full traffic to the street? The pits which were dug would be filled with earth? A. There was, as I recall that location, two traffic ways. There was a cut in the centre. I have a picture in my mind of going down that street at the time of construction. I am open to challenge on this because it is just a picture I recall. There was a cut in the centre of the street at the manhole "A" referred to. There was another cut at the west wing of the pavement and another at the east wing and between those cuts I recall sufficient traffic way oh perhaps ten or twelve feet wide as I remember it, which was carrying traffic in the meantime. Of course the traffic along the lane would be interfered with but traffic along 7th Street, while slightly inconvenienced, was not interfered with. 10

Q. And there is no doubt that the City's view was and what they asked to have done was to cross these streets with as little interference of traffic as possible? A. Yes, we realized there had to be some inconvenience with an installation of that magnitude being done in such a short time. We realized that. 20

Q. But that was the City's view, that the streets should be crossed by the gas company with as little interference with traffic as possible? A. Yes.

Q. And there is no doubt it is a good thing to leave a line lying for some time, certainly up to testing time without complete backfilling? A. I will agree with that.

Q. And in order that we may not differ I want to give you these circumstances and see if you won't agree with them. The contractors were Williams Bros.? A. Yes. 30

Q. And you at that time, and by you I mean the City, had gangs of street employees doing pavement work and general street work? A. Yes.

Q. You had a staff of men? A. Are you referring now to gas restoration?

Q. Yes and to men who did the patching in the pavement? A. We put in a special gang for the restoration of the pavement on the gas main. We put on a special gang of backfillers and base men.

Q. The company said to you while they had a right to make this, they thought you might rather clean up your streets in the way you would like to have it when the job was done and charge it up? A. Yes 40 they made arrangements for pavement repairs and boulevard repairs.

Q. And even sod laying. You wanted to have the said streets restored in your judgment to as good a point as possible? A. Yes.

Q. And to that end you undertook to do that and you charged it to the company who paid you for doing it? A. Yes.

Q. And I am suggesting to you that in connection with that you did bill this company with considerable amounts of money for backfilling? A. Backfilling under pavements, yes. Please do not go away with the wrong impression. Are you referring to the backfilling of the whole trench and pipe?

Q. No. Here you are going to put a pavement across a place where a pipe has been laid partly by going down from the top and partly by tunnelling? A. Yes.

10 Q. You are going to put down concrete and on top of that you are going to put bitulithic. And you people certainly were not going to put down that pavement without backfilling whatever that backfilling might have been, were you? A. Well now. We started out on this pavement repair work and the arrangement was as you have outlined, that is the company got us to do what we call the pavement repairs. And the company was to leave the work in shape for these pavement repairs. We went to several locations and started in just to pick down eight inches below the surface of the street and put in the base and we found evidences of loose backfill and we then had to sometimes go right off and pick into the places and we found these places almost empty at the same time. Now I cannot call that anything else, well I would call it neglect
20 of the contractor.

Q. You can call it what you like, but I say you neglected it. A. No.

THE COURT: What duty did you do? A. We did it only for the restoration of the pavement.

MR. SMITH: Are you going to say that as engineer for the City of Edmonton, I do not care how negligent these contractors were—surely you are not going to tell me as engineer of this city that you put pavement down over a gas trench that was not properly backfilled? A. No, sir. Wherever we had indication of an empty cavity underneath the pavement we certainly endeavored to fill it. Now in order to do that sometimes we actually had to break down the pavement. But I still affirm—
30 I do not wish to lose—

Q. I am talking about what took place. A. I would not even say that in our endeavor to hold up the pavement, I would not assume any responsibility whatever for trench filling.

Q. I am merely asking you that where you found this condition you backfilled it as best you could? A. Yes, for the purposes of paving.

Q. And I suppose you also say to me that Mr. McGaffin is a good man and a man of some experience in that sort of work? A. Yes.

40 Q. Now I will leave that. A. I do not wish to elaborate this point and it may not be as important as I think it is. You are referring now to this particular location and you are probably referring to Mr. McGaffin's statement that he did the best he could and left it all right?

Q. I remember him saying something like that. A. I would like that to be considered in the light of the problem that was left. That is all.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.
Albert
Walter
Haddow
Cross-Ex-
amination
continued.

Q. Certainly. That is admitted. Now I will leave out this particular eighty feet of pipe and I want you to tell me if in your judgment the Edmonton distribution plant was well constructed, was of good material and in accordance with sound engineering practice. A. In my opinion it was. In my opinion Mr. Hill did very good work here.

Q. And I want you to tell me if the plans of this system were approved by you as City Engineer? A. Yes, they were.

Q. And I want you to tell me if you lent the Assistant City Engineer to the Gas Company for six months? A. Yes, an arrangement was made between Mr. Hill and me that Mr. Gibb would go over to the gas com- 10
pany's office, I think for six months, on account of Mr. Gibb's familiarity with the layout of the city and the various utilities, and it was thought that he would be of great assistance in the laying out of the distribution system.

Q. You will also agree with me that among Mr. Gibb's other duties he was the chief inspector of the company for the work done by the contractors in this distribution system? A. Well I don't know that.

Q. You did not hear him give evidence in the Archer case, did you? A. No.

Q. You have already said that you thought Mr. Hill did very good 20
work and I think you congratulated him on the completion of the job? A. Yes. I had very cordial relations with him.

Q. You also know that up to and including the time of this fire this gas was delivered in Edmonton in its natural state, up to and including the time of the fire, it was in its natural state? A. Yes that is correct.

Q. They did not do anything to it? A. Oh yes. It was not interfered with.

Q. It was gas as it came from the Viking field. Now a word or two about your model. I am suggesting to you that what you have done in building this model is to use inside dimensions? A. Outside dimensions. 30
We are referring, for example, take this manhole. We have just shown a round stick and it is not hollowed out.

Q. What I have in mind is the overflow of the sewerage from manhole "A" to manhole "B" and I suggest to you that that is a fifteen-inch tile inside? A. Yes, that is correct.

Q. And that you have shown only a fifteen-inch pipe. I am not criticising it. I only want it understood A. This model was intended to be an ocular demonstration of the layout and I do not say it is meticulously correct but I think it conveys in every case the general information that can be got in detail from the plan it represents. 40

Q. That fifteen-inch tile pipe is of what diameter? A. Fifteen inches inside.

Q. And what is the thickness? A. About eighteen inches.

Q. Outside? A. Yes.

Q. And in addition to that, that pipe has a bell end? A. Yes.

Q. So that the outside diameter at the bell end would be twenty inches at least? A. It would be more than that. It would be twenty-one or twenty-two. There would be an offset from the bell itself to accommodate the spigot end of the next pipe, we will say something like twenty-one inches.

Q. Will you explain to his Lordship what a bell end is, assuming his Lordship does not know?

THE COURT: You had better assume that I do not. A. If a sewer pipe were cut in two longitudinally. I will show a section (indicating in sketch) the bell end is a passage which allows the spigot end of the other pipe to be put in there and the angular space between the outside of the entering pipe and the inside of the bell we are discussing is filled with some kind of jointing material.

Q. And there is no doubt this pipe in manhole "A" and manhole "B" was in two and a half foot lengths and the joints were the bell spigot type which you explained to his Lordship? A. Yes, sir.

Q. Now this conduit box we have been talking about, I think you said was laid in 1926? A. Yes.

Q. The electric conduit box, the wooden box? A. Yes I think it was laid in July 1926. If I could see Exhibit 28 it gives it. Yes, sir, that is correct, 1926.

Q. And as I understand you in order to lay that main you opened right across 107th Street? A. No, sir. I looked up the pavement cut records for that and I find that there were, I cannot find that just now, but there were four cuts made across there. They were two feet wide and I remember they aggregated in length thirty-four and one-half feet.

Q. So that in laying the wooden conduit box you got thirty-four and one-half feet and you tunnelled fifty-five and one-half? A. Yes.

Q. Is my arithmetic correct? A. Forty-five and one-half.

Q. You mean across the intersection? A. Across 107th Street as shown on the model.

Q. And that work was done by the City employees? A. By the electric light department.

Q. We had nothing to do with that? A. No, sir.

Q. The gas company's men nor their contractors had nothing to do with the laying of that line? A. No.

Q. Or with the level of it or the tamping of it? A. No, sir. You are absolutely free of any connection with it.

Q. And was it laid to grade? A. It was laid—with regard to grade the electric light department came to us and got the utilities that were along the lane and then it was not laid to an instrumental grade.

Q. There would be no necessity for laying it to an instrumental grade? A. No. The idea of the electric light department was just to put it in as shallow as they could because it is simply as I have described it, three electrical conductors and there was a wooden box put around it as

a—I suppose you would call it a warning rather than anything else. It had no structural advantages.

Q. It is not much more than a warning, is it? A. Yes. We find in our practice around the City that a workman is working with a pick and shovel, it is quite common to stick a pick into a cable underneath, for example in the white way and it was put around to avoid that.

Q. And what happens to the workman if he does that? A. It depends if you find him.

Q. But there is no doubt that this wooden box can best be described by you as a warning? A. That is all it was for. It really has no structural purpose or significance at all. 10

Q. It may have no structural purpose but I think it has a great structural significance and we are coming to that now. It has this structural significance, that it provided an almost uninterrupted way to carry gas from the break in the pipe to the Corona Hotel? A. Yes, I think it is the way in which the gas went.

Q. It has lost that structural significance now? A. Well by structural significance I meant using the engineering term.

Q. I think you used the right term and my friend the wrong term. A. Yes it offered a free open way for any gas entering it.

Q. And when the electric light department in this City— A. The 20 electric light department constructed it. It is a street railway return. It is an interdepartment arrangement whereby the electric light department takes over the returns.

Q. When the electric light department of this City built this wooden conduit box which is here painted green, they were well aware that they were building beside and almost touching a twelve-inch intermediate pressure gas main carrying thirty-five to forty pounds pressure? A. They knew, at least there was a gas main there. They knew that this gas main was there because I believe in construction it was there to see.

Q. Well you knew it anyway? A. Yes. 30

Q. And do you think that it is good engineering practice—well I am not going to ask you. You do know that gas lines break? A. Yes.

Q. That is the history of the world with natural gas? A. Yes that is correct.

Q. For various causes they break down? A. Yes.

Q. They “fail” I think is the technical word engineering people use. And are you going to tell me you think it good engineering practice to parallel a forty pound pressure intermediate gas main with a comparatively unobstructed passageway which will convey gas from any break there may be in that line? A. Yes, I do. You are referring to the possibilities of gas leaving your line? 40

Q. Yes. A. Yes, we did this probably in relation to the manholes. Escaping gas from mains has the same opportunity to go into other works as in there.

Q. Well two bad boys don't make a right? A. Now I do not know anything about the legal phase of this but I take it that each person looks after their own commodity. Let me explain that. Here is a water main. We all know that water mains carry water with a pressure of from forty to one hundred pounds and we also know that water mains are liable to rupture. Now there is always the possibility—supposing this water main had burst and excavated a large cavity in here it would either so let down your mains or let down a wall of an adjoining building—that is a possibility, but I do not know, it seems to me we would hardly be justified wherever we parallel a water main with another utility to make construction for the purpose of offsetting that probability. That, it seems to me, is one of the hazards we have to take in laying out utilities on a public street.

Q. You will probably admit with me that if these cables had been enclosed in a cement box rather than this wooden structure they never would have carried gas down to the Corona Hotel? A. No I would not go all the way with you on that.

Q. I mean if it were air proof—if it were impervious? A. There would be no occasion for making that construction impervious because it already has its imperviousness, if you wish to use that word, by the insulation around the conductor. The negative returns were complete in themselves. The ground could simply have been scratched or ploughed and those cables laid in there and the construction would have been complete.

THE COURT: I am afraid you do not understand Mr. Smith's question as I understand it. He suggests if instead, the conduit box had been constructed not of the material it was? A. Well I will say yes, if you had constructed the casing around the cables of first class concrete and there had not been any fractures in it, then there would have been less possibility of the gas going into it. You will understand you would not have encased those cables so they could not have been withdrawn, they must be just as in the telephone conduit here. The construction here is first of all what we call fibre conduits. It is material made up three and one-half or four inches in diameter and as many as twelve of these are laid in rows of three and they are encased with this conduit and at certain intervals there are telephone vaults and then the lead sheath cable is then drawn through. It must be of sufficient size.

Q. Going back to what you said a moment ago—that you could have ploughed a furrow and put these cables in there without covering it— A. As long as they have mechanical protection. That is all that is necessary.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 39.

Albert
Walter
Haddow
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*
—
Plaintiffs'
Evidence
—
No 39.
Albert
Walter
Haddow
Cross-Ex-
amination
continued.

Q. And you would mean by that, on the outside of them? A. To protect them from mechanical injury.

Q. As someone hitting them with a pick? A. Or driving over them.

Q. And if they were put three feet in the ground you would not require any more protection? A. Oh no.

Q. And are you suggesting these cables could have been laid without any boxing around them? A. Oh certainly.

Q. And if they had been laid in that way and without boxing, our gas would not have got through to the Corona Hotel down that cable?

A. Oh no it would not.

10

Q. And once again, do you regard it as good engineering practice to lay a cableway not impervious to gas alongside a twelve-inch gas line carrying thirty-five to forty pounds pressure? A. Yes. Taking our previous explanation into account I cannot say anything else. I think it is all right.

Q. Your reason is you think we should take care of ourselves and you should take care of yourselves, we being the gas company and you being the City? A. Yes. I think the construction is good when it is adequate for the purposes for which it is laid down and—

Q. And without relation to other utilities? A. Without relation, 20 certainly having relation to other utilities, but had we put this return cable in such a way as to actually interfere with your pipes and cause you trouble then I think we would be wrong. That is poor engineering. But I would say there though there was none of that happened at all and I still come back to my explanation that there are hazards inherent in the distribution in the city of public utilities. For example, supposing a stray current got away and ignited your gas, that is a hazard of the fact that electric currents are in the vicinity of inflammable material, but you would not for that reason—I could not ask you for that reason to say it would have to be good engineering practice to insulate your pipes. You 30 could not be expected to do that any more than we should have to put an insulated joint in laying a water pipe and prevent currents crossing and causing electrolysis.

Q. You say there are hazards inherent? A. There are hazards in any utility.

Q. I suppose your view is that this thing that happened here is just one of the hazards of the business that has taken place in this case?

A. Of course there are hazards and hazards. It is a hazard, certainly, but the cause of the hazard is a different thing.

Q. I am going to talk to you about the cause of the hazard, and I 40 suppose you are going to agree with me that we have one of two explanations. Granted we found the gas leak as it has been described, granted it went down to this place, down the lane, down this conduit. Assuming that, I think you will agree with me that this break in this pipe was caused in one of two ways; either by subsidence of the pipe as

I understand your theory to be, lack of alignment plus poor backfilling at the time of construction. That is your theory. A. My theory is that the weld was fractured by being over-stressed, of course.

Q. There is no doubt about that. A. Yes. My theory of the over-stressing is a combination of subsidence and contraction, that is axial contraction.

Q. I am going to leave out axial contraction for the moment because I think you will also agree with me that if you have the provision for axial contraction and expansion we can almost forget that. A. If you have provisions? You have not provision in a rigid pipe. You are referring now of course to the dressers.

Q. We have got six hundred feet of solid pipe between here and Viking that has been there for years.

MR. WOODS: Are you giving evidence?

MR. SMITH: No I am not.

MR. WOODS: Then I object to the question.

Q. MR. SMITH: Will you assume six hundred feet of solid pipe east of this City, subject of course to the same temperatures you are? A. Yes.

Q. Lying there for eight and a half years without any break or trouble of any kind? A. Yes. I will go further than that. I will say we have a mile or more of street railway rail stressed and welded in exactly the same way but the structure is able to take that stress. Now that I think is the difference between this and the case you cite. When one puts up a continuous structure like a rail and pipe he knows he is going to get axial contraction. Now then the construction—the design and construction of that structure must be sufficient to take up those stresses which are induced. Now in this particular case that was a factor in the fracture. In the case of the street railway rails it looks like we ourselves, by cutting the lips of the rails, induced the condition that allowed it to fail. I have no quarrel with the fact that you have eighty feet of solid pipe or six hundred feet of solid pipe as you state. My point is, though, that having put that in, that there is some factor that has failed there; that is the weld has fractured and has not been sufficient to take up the stresses that were induced.

Q. I will admit there is some stress in all solid pipe. A. Very considerable, very considerable.

Q. And what you try to do by dresser couplings is to take up the expansion and contraction? A. Yes.

Q. And if at the time when this pipe was taken up those dresser couplings were in perfect condition on either end then you would assume

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 39.
Albert
Walter
Haddow
Cross-Ex-
amination
continued.

they had done their duty and taken up that expansion and contraction?
A. No, Mr. Smith—

Q. Well why instal them, otherwise? A. Your dresser couplings would serve that purpose and they would also serve the purpose of deflection movement. Now I would say they would serve the purpose of allowing deflection at that joint possibly at all times, summer and winter, but during the winter particularly I think on account of the frost creep—there is eighty feet of frost creep around that pipe, that is exceedingly powerful. You could not even begin to jack that pipe through eighty feet of frost jacket. You would destroy the pipe before it would ever move. Therefore that cannot be transmitted to your Dresser couplings—that axial movement. 10

Q. You think you do not break the frost bond? A. No, sir, you do not.

Q. Now let us take the temperatures, a sixty degree differential?
A. Yes.

Q. And the maximum? A. Forty.

Q. And the minimum? A. Twenty below.

Q. I suggest to you that you could find more reasonable, and by that I mean much more accurate, temperatures than the two you gave me, couldn't you? In other words, ground temperature in the summer time is lower than atmospheric temperature? A. Yes. 20

Q. And ground temperature in the winter time is usually more steady and is higher than the atmospheric temperature? A. Yes.

Q. So it is not very often you have your ground temperature twenty below zero? A. No. I would say our ground temperatures—

Q. Wouldn't ten and fifty be better figures? A. Fifty above and ten below do you mean?

Q. Yes. A. No. I think it would vary from winter to winter. But if ten and fifty I would have no objection to those figures being used when they have the same range. And that is what counts. 30

Q. Don't you think that they would be closer to our mean temperatures and perhaps a little more accurate than the one you use? A. Well we have no continuous reading of our ground temperatures so that we just have to take them as we find them occasionally.

Q. And your view, as you told me a moment ago, was that the frost came down from above? A. Yes, sir.

Q. And isn't it a fact that about the time of the frost up here we have usually had some cold weather and our ground temperature has gone down considerably from its summer height? A. Oh yes the ground temperature falls. 40

Q. So that about the time the frost line strikes our pipe, our pipe is at a temperature almost of freezing? A. Yes, if you have had a severe spell, your gas has come seventy miles from Viking and of course it is practically at ground temperature. As I remember your pipeline, there

are a few spots in it where it is exposed to the air, for instance there is a slough at Shontz I believe. But to make a general statement as will serve the purpose here, your pipeline, your transmission line, would be buried about the same depth as your distribution pipeline and therefore I think the temperatures would be about the same coming from the field as they are in the city.

10 Q. What I want to get at is this. I agree with this. I do not know anything about it but it seems reasonable to me, but what I am getting at is this that by the time this frost strikes our pipe and it does not form the bond until after it is freezing around the pipe, does it? A. No, that is the frost bond, no. That is quite correct.

Q. So that by that time a very considerable amount of the contraction or expansion would have already taken place? A. No. I think you are assuming that during the summer time, that is before frost, that there is no bond between your pipe and the surrounding soil. I think the best way to illustrate that to you—

Q. I was wondering if you thought the freezing of the ground increased the bond between the soil and the pipe? A. I think it does.

20 Q. Then what I am trying to say is this, and I want you to agree or disagree, that up until the time, certainly that the frost surrounds our pipe, the only thing we have to contend with is the ground bond? A. That is for axial movement, yes, sir.

Q. And there also is now that before the ground freezes it has reached a temperature of almost freezing, that is almost axiomatic? A. Yes.

30 Q. And our pipe therefore has taken some movement by virtue of that change in temperature before we have any frost bond or the bond increased by frost at all. That is axiomatic? A. No, not at all. To indicate the resistance there would be two movements of your pipe. Consider it as a horizontal pile. Under our conditions we would get a stiff bearing load on a pile of that size of probably a ton to the foot.

Q. Now these things can be figured fairly accurately? A. Yes they can.

Q. And unless you have the figures I do not think I want any generalizations with respect to them. A. I will probably say this, that there is a resistance—there is a resistance from the manhole “A” to our dresser coupling of at least forty tons.

Q. You mean the axial? A. Yes.

40 Q. Well that is not much after all? A. Well forty tons is quite a load.

Q. What method of calculation did you use in arriving at your figure of eleven thousand seven hundred? A. A sixty degree temperature change gives stresses of eleven thousand seven hundred pounds to the square inch. “S” equals TEN. “S” is the stress in pounds per square inch on the pipe; “T” is the temperature of the pipe; “E” is the modulus of elasticity—thirty mil, and “N” is the co-efficient of expansion—.5065.

Q. And I do not know whether I asked an intelligent question or not. Did you figure fixed ends? A. Yes. This expansion—that formula is independent of length. That stress would be induced if there is only a four foot length of pipe, as well as in an eighty—fixed ends.

Q. This weir chamber is inside dimension too? A. No, outside dimension. It scales three and one-half feet on the little section shown on the plan Exhibit 28 and it also scales practically that on the model. Now the dimension along the pipe it shows three feet from the face of the manhole to the front face of the weir chamber but it is shy of that on the model; it shows only a little over two feet. 10

Q. And you might show that to his Lordship. The weir chamber on the model is roughly one foot short of what it should be, that is coming between the manhole— A. The model is a scale of an inch to the foot.

THE COURT: What is the note you want made of all this?

MR. SMITH: I want to show that the weir chamber is one foot— projects one foot further than shown on the model. A. I would put it the model is one foot less than the weir chamber.

Q. THE COURT: Which way? A. The model to be strictly in accordance with the actual dimensions should extend another inch from the manhole—towards the manhole "B". 20

MR. SMITH: And I also suggest that you look at your model and I suggest to you that the roof of that weir chamber is not a sloping roof in any sense of the word. This was shown on your plan and was shown on your model. It is an absolutely flat roof? A. Practically.

Q. There is no doubt about it? A. Yes, flat.

Q. It is also flat on your model? A. Yes.

Q. So the evidence we had from Mr. Underwood—wait till I get the dimensions he gave. I understood him to say there was a pipe of five foot six inside the weir, a sloping roof of three feet three on the other, if I understood him correctly. A. I wonder if you misunderstood him when he was referring to the top of the tunnel? 30

Q. Probably. A. Because that is our practice to run the top of our tunnel in a sloping direction against the manhole because it facilitates our backfilling.

Q. Well that may be cleared up. What he said was there was a slope in the roof of the manhole. That is wrong? A. Yes I would say the roof of the tunnel.

Q. And what the situation is—you are carrying along a tunnel for placing your pipe, whatever it is, and then you carried it up in your excavation, you carried up a slope from the top of this tunnel to the top of your weir chamber? A. Yes, sir. 40

Q. Something in the way I have my pencil here on the model? A. Yes.

Q. There was no slope in the roof of the weir chamber? A. No.

Q. And that is the only slope that was there? A. Yes.

Q. You told Mr. Woods in your view, gas got into that hotel in five minutes or less? A. That was my opinion on the assumptions I made.

Q. If you say the gas got into the hotel from our main I will agree with you in that. And this much is obvious; we will assume that Christie told the truth on the second story, that he lit a match and something exploded, and we are going to assume for a moment that that was gas. Christie, as we know, was wild with pain, quite seriously injured. A. I am not familiar with Mr. Christie's story.

10 Q. We also know that in that basement there was a furnace going, there was a water heater going, burning coal. We also know that in the kitchen, there was a fire burning in the range in the kitchen of the hotel, and you know the location of these various places. A. I do not know. I know how it is described as being directly above the back of the basement—the south wall.

Q. And if gas would get in there in five minutes, and Christie should light a match and doing no more damage than we have heard, namely some soot coming down from the fireplace chimney and Christie being no more burned than his hair and his face burned, you have no doubt what-
20 ever that at that time not much gas got into that basement? A. I do not know whether it has been brought out in evidence how the fracture developed. When it was found next day I think it was either six or nine inches long but I have no doubt that when the fracture developed it would develop possibly a bit at a time, at the beginning of the escape I think a comparatively small volume would come. The figures I gave were on the assumption it was escaping at a rate—

Q. Well don't you think that at the last subsidence you would get a considerable break? That is the view we have. A. It might be true, but you will remember it took from February till the middle of June for
30 it to develop that fracture from six or nine inches up to one foot nine inches, indicating a progressive enlargement of that. I think that the first fracture would go—it always does—it lets go like that and providing it had not reached its elastic limit. If it was over it, it would go quickly, but there is a possibility that the fracture at first was a comparatively smaller one than was found the day following and the amount of gas escaping would be correspondingly smaller at first.

Q. What I am coming at is this that if that thing made any considerable fracture there when it first went it would not take long for that gas to get into that basement? A. No, that is my idea.

40 Q. And I put it to you in this way, that if during the fire gas continued to come in any considerable quantities you have to assume a good sized fracture to permit that? A. Yes.

Q. And if Christie had not lit his match when he did, if he had lit it a few minutes later you have no doubt serious consequences would have taken place from the explosion itself? A. I think the more gas there was in there I suppose the results would have been more disastrous.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.
Albert
Walter
Haddow
Cross-Ex-
amination
continued.

Q. You have no doubt on that? A. No.

Q. The gas would not reach the furnace then? A. Well I think anything there would have ignited.

Q. And the gas was not enough to have been ignited by the kitchen range? A. Well I don't know.

Q. Well from the evidence we have, that is the situation. So I think you will agree with me very frankly? A. I am just offering this comment on passing. It was taken into consideration, was it, the draft passed the stove? It is not important at all.

Q. There is no doubt about this, that gas introduced into this room, 10 I am speaking of natural gas from the Viking field, it being six tenths the weight of air, it would enter the room and go to the top and there being air there we would have some diffusion? A. Yes.

Q. There is no doubt there is diffusion? A. Yes.

Q. And as the gas increases the whole room will increase its density in gas? A. Yes.

Q. Still having the greater quantity at the top? A. Yes.

Q. And there is no doubt that at the time the match was lighted if there was any considerable quantity of gas it would have blown that hotel to pieces, wouldn't it? A. The greater the quantity of gas it would 20 have been a greater fire.

Q. And this explosion was a very slight one, a slow puff?

MR. WOODS: A thud.

Q. MR. SMITH: Yes, and a man thought it was a motor car. Now assuming we set this hotel on fire by having Christie light this gas. I am saying this to you, that in your judgment as an engineer that the weakness of the explosion or the smallness of it, there would have been no physical damage to property and Christie only slightly burned—does it not prove to your mind conclusively that this was a brand new leak that put gas into that hotel in the five minutes you speak of? A. It is not so 30 much the intensity as the extensiveness of it.

Q. Well it was not intense? A. I think the area of the burn would be limited pretty much to the gas present. The intensity of an explosion is due to the fact that it is contained. You could have a more intense explosion with a smaller quantity of gas.

Q. THE COURT: What is the answer to the last question? I would like to have it.

MR. WOODS: I object to this form of questioning. I do not think my friend is justified in saying there is anything before the Court to date to show the extent to which that gas had at that time percolated through 40 the basement or through that wall. There is nothing in the evidence up to date to show that the presence of gas there in that basement—in the wall of the hotel—was a small quantity.

THE COURT: It strikes me that the questions were asked in cross-examination which, by the way, are about a matter which to my mind is exceedingly important, even so framed that the witness can answer them. And as far as I am concerned I would like to have an answer.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 39.

Albert
Walter
Haddow
Cross-Ex-
amination
continued.

THE WITNESS: I would say on the basis of the hypothesis Mr. Smith went through that the area of the explosion, if you want to call it that, or the burning would be practically limited to the area of the gas cloud.

10 Q. And his question was whether on the hypothesis you have heard this leak was a brand new one. Do you agree with that or not? A. The gas in the place was comparatively small and I think, sir, that, following our own theory of the case, that the break was a comparatively new one. I think so.

MR. SMITH: And some time later the firemen in this case have sworn it was confined to a small area in the basement of the hotel. That assists you, I think? A. Yes.

Q. And you as a scientific man would be of the opinion it was of very recent origin? A. Yes.

20 Q. And as a scientific man you would agree with me that no system of inspection that you know of would have caught that recent break? It was a Sunday? A. A man might have inspected it an hour ago and the pipe been perfectly taut. The break I think would happen almost I think with a snap (snapping fingers).

Q. You do not know of any system of inspection which in your judgment could have permitted us to find that break in time to stop this calamity? A. No. I think it would have been almost an accident if your inspector had just happened along at that time, so far as the escape of gas is concerned.

At 12:25 Court adjourns till 2:00 p.m.

30

At 2:00 p.m. Court resumes.

Q. I want you to give His Lordship an idea of what goes on when a line of this type is laid. Do you remember which way they came, from the east or west? A. The gas line?

Q. Yes. A. I could not tell you whether they approached the intersection from the east or the west, but the usual procedure that happened here is, the intersection of 107th Street—

Q. You are pointing at the model? A. Yes. The area over the intersection is paved. The area over the lane east and west of 107th Street is unpaved.

40 Q. I am suggesting to you that the lane itself would be dug by the open trench method? A. I think so.

Q. And then, coming to the street, the bits or cuts as you indicated this morning would be dug leaving ten to twelve feet of roadway which of course would be tunnelled? A. Yes, sir.

Q. I wonder if you remember this, that the general scheme of going underneath pavements was to leave roughly, at the City's request and for safety's sake, an area of about seven feet at the side of the curb in order that fire appliances might be able to approach hydrants? A. I have no doubt there may have been an arrangement of that kind. Mr. Hill told me this morning they had that request.

Q. It seems to be a reasonable thing to have done? A. Yes. 10

Q. So that you would have two seven feet—I am not suggesting you were a member of this particular street gang but there is a hydrant there? A. At the southwest intersection of the lane and the street, yes.

Q. So it would be a reasonable thing in a person crossing that street to leave these seven foot areas uncut? A. I agree, yes.

Q. Trench, roadway, trench, roadway, trench? A. Yes.

Q. That would be the order of the thing as you went along? A. Yes.

Q. And the lanes at that time were not paved? A. No, sir.

Q. And were done by what is known as the open cut method? 20
A. Yes.

Q. That is removing all the surface and without any tunnel? A. Yes.

Q. And do you remember that the lanes were dug, the trenches in the lanes were levelled by an instrumental level? By that I mean an instrument? A. That is the gas trenches?

Q. The gas mains, yes. A. I don't know that. I don't remember.

Q. You had asked them to dig their trench to established grades. That would be a reasonable thing? A. I put a note on the approval plan "this lane—

Q. —"should be carried to levels and surplus excavation removed?" 30
A. Yes. It is a note on the Gas Company's plan No. 41, August 2nd, 1923, approved by myself, "on this lane run to established grade and take away surplus excavation."

Q. And the note which you have there "N.B. on this lane run to established grade and take away surplus excavation." and that is your signature underneath "A. W. Haddow?" A. Yes.

Q. And I do not think you have any reason to suppose your instructions were not carried out? A. I do not know whether they ran with an instrument or not. My main idea in making that note on there was there were so many utilities along the lane, south of Jasper particularly, that 40 they had to keep within fairly narrow limits in order to avoid them.

Plan of construction on lane south of Jasper Avenue, August 2, 1923, approved 14th August, 1923, marked Exhibit 37.

(Answer continued): That is the layout between 105th and 111th

Streets on the lane south of Jasper continuing and from 111th Street to 102nd Avenue and that includes the intersection.

Q. I suppose you know that Mr. Forbes who is one of the company's inspectors is dead, and not available for us? A. I heard Mr. Hill say that.

Q. And Mr. Forbes was working under Mr. Gibb? A. Yes. You said this morning you understood Mr. Gibb was chief inspector. I did not know that.

MR. WOODS: Of course Mr. Gibb was a Gas Company employee.

10 MR. SMITH: During the time Mr. Gibb was loaned to the Gas Company from your department? A. Well I do not know the internal organization of the company.

Q. But having asked these people—having put this note on their plan to work to grade you say you did that because of the number of utilities there and your anxiety that there should be no interference? A. Yes.

Q. And I take it it would be reasonable to suppose that the contractor working on that plan with your notation and having a knowledge of those utilities would endeavor to work to grade as honestly as he could so as not to create trouble with the authorities. That would be a reasonable thing? A. Oh I should think he would try to do that. I did not take
20 record of elevations so I cannot say but I am willing to say here that the company were always quite willing to follow out our instructions.

Q. They tried hard and they did work in very close harmony with you? A. Yes, we had good relationship.

Q. And you tried hard and did work in very close harmony with them. It was not one-sided? A. That is fair.

Q. That is a fair statement? A. Yes.

Q. And especially from this extent you would not have any doubt they endeavored to follow your directions? A. Yes, so far as I know.

30 Q. And I want to speak again about the wooden conduit. You told me as I recollect this morning that it was laid to grade but not to an instrumental grade? A. Yes.

Q. That is crossing under 107th Street? A. Yes.

Q. By that I suppose you mean that in laying a job like that—do you mean this, that the company were given the heights of the telephone poles, I mean a mark on a telephone pole and told to construct a certain distance beneath that mark in crossing 107th Street, as a grade?

A. That may be true but I don't remember it. But that is a common way of giving grades.

40 Q. To give it to the contractor by a mark? A. We put a crow foot at a telephone post and say "grade three feet low" or whatever it is. That is a common way of doing it.

Q. Now coming to your conduit box you say it was not laid to an

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.
Albert
Walter
Haddow
Cross-Ex-
amination
continued.

instrumental grade. What you mean I suppose by that is this, here you had openings in the street? A. Yes.

Q. Whereby you could with a stick or a rod, your rod is the thing with the measurements on it? A. Yes.

Q. He could every so often cross that road, take his rod or his stick or his picket and put it down to the bottom of the trench and using the top of your bit as a level and get his grade pretty well with a stick, couldn't he? A. No. What I think was done there was he would come to our office, and we will say dealing with the lane south of Jasper—

Q. Would you mind confining yourself to the conduit box for the moment? A. Yes. They would get—the electric light department would—get the various utilities on this lane and on 107th Street. They would be told what there is to look out for, that is particularly the things that they cross so that they would not run into anything and have to jump over it or go underneath it. They would be given their grade there. Now with those drilling points on the balance of the lane where it was not so important the variation would not make much difference. That I think is the main restriction so far as that conduit grade is concerned and really that applies also to your gas mains, with this additional provision, that there were places on those lanes where we knew we were going to have quite a cut and we wanted your people in their original specifications to show the cover of approximately two and one-half feet. If there was to be a cut of one and one-half feet at that point that pipe would have to go down four feet. 10

Q. That is to the grade you gave? A. Yes, to the original grade.

Q. What I was coming at is this, that while you might lay this conduit box—or the street railway department—while they might lay this conduit box somewhat, well without the most minute grade to levels in the lane, the minute they come to go underneath the pavement greater care is necessary? A. That is with regard to grades. 30

Q. Levels and backfilling and construction generally? A. Well I would not say not a great deal of care. There would be with regard to backfilling—the same problem would arise with them that arose in the case of the Gas Company but as far as the cables are concerned, providing they do not interfere with anything, the fact that they are on a sinuous grade would not affect them a bit.

Q. You told me this morning that this conduit box was laid to grade but not an instrumental grade? A. Yes.

Q. Was it the city work or contract work? A. The city work.

Q. Well we all like to do neat jobs if we can if it does not cost any more money? A. Yes. 40

Q. And the man in charge would take grades across there and endeavor to get that on the lane grade if he could? A. I think across the street his concern would be—he would know that he could not go down below the depth which would interfere with the catch basin "B" coming from the northeast corner. He would know that as an inference and that

is about two feet. He would know in this case he would have to keep above that. There are other places, for example, on the lane east, on 106½, there was a power duct or telephone duct as well going across from the telephone vault into the hotel which controlled the grade and in this case his main concern would be to keep two and one-half feet or so below the top of the pavement.

Q. Now coming back to the construction of a trench. You have no doubt whatever that this trench would be constructed on either side of 107th Street in the lane? A. Yes, I think that is true—open cut.

10 Q. And I am going on the basis, because it is the best information I can get, that the four lengths were welded together and dragged through the cut? A. I will agree to that. I would like to say this—

Q. Mr. Hill had the other idea at one time and told you. A. No, I was wrong. In my report to the City Commissioners I stated I had been informed that two forty feet lengths had been strung together and pulled in and welded at the point where the weld fractured. But Mr. Hill and I talked that over and I think my information was wrong and I think that the pipe was strung up eighty feet in length and pulled in from one side, whether east or west, I do not know.

20 Q. My information is it went up grade and that would be towards the Corona Hotel and that would be from west to east? A. Yes.

Q. And your information is pretty much the same as mine? A. Yes, pretty substantially.

Q. And in the digging of that trench I suppose it is at least two shovels wide? A. Yes.

Q. I mean the man digging must go the width of two shovels? A. In fact more than that.

Q. He must do at least that? A. Yes.

30 Q. And would your information be that in digging the trench sufficiently wide to accommodate that twelve-inch pipe, would there be a bench as is so often done in the digging of trenches? A. No, I think the customary way especially in restricted tunnels is for the man to get right into the tunnel and very often they are supplied, if the ground is hard enough, they are supplied with a short handled pick and they work probably from their knees, they are even kneeling, sometimes sitting down and they will pick away at the face.

Q. You are speaking of tunnelling? A. Yes.

40 Q. I am not in the street yet. I am in the open trench where no doubt it would be dug by pick and shovel? A. In that case it is just a case of stringing the men along. First of all a trench is marked out. A foreman will get his line and send a man along and scratch up with a pick which indicates one side of the trench. His men are then stationed out so far apart and instructed on the width of the trench, sometimes they mark both sides. And the man begins to dig in the ordinary way and throws the soil to one side.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.
Albert
Walter
Haddow
Cross-Ex-
amination
continued.

Q. And that is the ordinary method of construction which was approved of in 1923 and is still approved of? A. That is standard construction.

Q. And one man digging here and another ahead of him would make slight inequalities in the trench bottom. That would not be an unusual thing? A. If you are digging out the bottom of the trench to a grade it is the foreman's duty to watch that phase of it.

Q. But you might get slight inequalities and where you have slight inequalities you take off where it is high and fill it where it is low. Is that pit and stall? A. No, that is where you open the pit and do a little tunnelling. But this is called open trench. 10

Q. And you can see no difficulty in this gang having constructed a good trench open cut up to the pavement at 107th Street? A. No, not the slightest.

Q. And having gone into 107th Street as you have already indicated it is not a difficult matter to have continued that grade there under those conditions? A. Yes. Sometimes a man who can dig in an open trench, put him into a tunnel I am afraid he is not so accurate.

Q. That is the human element may fail? A. Yes.

Q. But you have a foreman there and he gets levels if he wants to with a stick? A. A boning rod. 20

Q. He can get it at equal intervals across that road? A. He could get it just as frequently as he wanted to get it.

Q. And in this construction there would be no trouble in the foreman with his boning rod having that ditch constructed to grade? A. Not the slightest. He could run that—a man who is trained in the use of boning rods can run a grade very very closely.

Q. And you can think of no reason I am sure—we all like to do our work as well as we can? A. Yes, I will repeat that.

Q. And I have no doubt that the same thing applies to the foreman who is going under 107th Street? A. Yes, I think a foreman should do that. 30

Q. He cannot do it any cheaper by running it crooked or off grade. It is just as cheap to do it right as wrong? A. No, as a matter of fact it is cheaper to do it right.

Q. And we find a difficult job under the pavement at 107th Street and we find it more expensive to do it badly than to do it right? A. Yes.

Q. And therefore we must look elsewhere for some reason why this thing should go wrong? A. Yes. I agree. It is more difficult than an open trench. I agree it is cheaper to do it right in the first place. 40

Q. And we have crossed under three hundred pavements in this city by a similar manner? A. Quite a number. I don't know how many.

Q. We have crossed under a tremendous number of pavements in the City of Edmonton? A. Yes.

Q. By the same method? A. Yes.

Q. And this is the only broken weld that you have ever heard of in this city under the pavement? A. As far as I know it is, under the pavement itself.

Q. Therefore, I come squarely to your plan showing what you found. No, I will not do that yet. We will say we have drawn our eighty foot length through there. I am showing you a ditch in this city which I am not pretending is the same ditch but I want His Lordship to get some idea of the bottom of a ditch. You recognize the locality. I do not. This is a photograph of a ditch? A. It is a photograph. Oh it looks to me a gas
10 ditch on the east side of McDougall Avenue just north of Jasper Avenue.

Q. To make things plain, in order that there will be no doubt about it, it looks to be a wider ditch than we are using here. That struck me. It may or may not be true. A. It would strike me to be about probably two and one-half feet wide.

Q. Here is what I have in my mind and the kind of trench I was speaking about. You observe the man in the forefront of the photograph, he is on a higher plane to the ditch to his right? A. Yes.

MR. WOODS: We will mark that.

MR. SMITH: I tender this photograph.

20 MR. WOODS: I take the formal objection. Mr. Haddow, the City Engineer, is here subpoenaed by us and true enough he is under cross-examination but my friend is using him now to prove a substantial portion of their case and tendering a photograph of some other place in the city where he desires to direct his evidence towards, from Mr. Haddow. I object to that evidence in the same way that my friend objected to my evidence. It is sought to prove by my witness, other places—

THE COURT: Is your objection to the photograph?

30 MR. WOODS: It is to any questions asked in regard to the photograph in relation to that point. It does not seem to me to advance this case that the Gas Company did or did not do certain things at other points. And as this evidence is called by my friend I do not want to let it go without objection.

THE COURT: I do not take it that was the intention of the use of the photograph or of any question asked. And as to the photograph I rather gather you invited Mr. Smith to put it in.

MR. WOODS: I wanted to know if he was tendering it because I wanted to make my objection because he is obviously going to ask a lot of questions about it and it seems fair I should be allowed to make the objection.

40 THE COURT: What is the purpose of the photograph?

MR. SMITH: To show Your Lordship a trench in the City of Ed-

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.
Albert
Walter
Haddow
Cross-Ex-
amination
continued.

monton; to then ask the witness if the soil in this particular case was of a similar type of soil so that you might observe the bottom of this trench and have some idea what the bottom of that other trench looked like when it was made.

THE COURT: Or what it might have looked like if done properly?

MR. SMITH: Whether we get off grade or not it is not going to affect the texture of the bottom of the trench? A. No. The soil would be the same.

Q. THE COURT: So far as the objection of Mr. Woods goes I do not take it that it affects this line of examination at all. I will admit it. 10

MR. WOODS: Well I was not sure, My Lord.

**Photograph of trench 100th Street between Jasper Avenue and Post Office,
marked Exhibit 38.**

Q. MR. SMITH: Would you mind looking at what has now become Exhibit 38. You will observe in that photograph that the gentlemen in front of you, there are three of them in a row, is digging that trench, one-half at a time. In other words in benches? A. Taking it up in longitudinal steps. 20

Q. We will assume this table here is the trench and he is using a centre line and digging to the left and leaving a bench to the right and he is now taking off that bench to the right, in the photograph? A. The lower left goes along.

Q. Is deeper than the place where he stood? A. It looks as if half of the trench has been taken down a spade length deeper than the other.

Q. That is exactly what I had in my mind. A. Yes.

Q. And that is not an unusual method for digging a trench, is it? 30
A. To tell you the truth I think it is the first time I have noticed this being done.

Q. I suppose you did not watch this construction very much, at least the spade end? A. It is more usual to take it up in longitudinal steps. One man would take out a shovel and No. 2 and No. 3 and so on and then another man would be put in to start and take out No. 2 left and these men would be working one behind the other at a shovel length. There may be some reason for that which I do not know (looking at Exhibit 38). It strikes me it would be a more convenient thing for that man to have the full width ground to work upon. Unless there is some other reason which I do not know about that is what would strike me. 40

Q. The point I am coming to is this, Mr. Ruff told us that he found a line of cleavage longitudinally along and underneath our pipe which he thought showed a ground separation. You remember that? A. Yes.

Q. And I just wondered if this cutting had been done by the method which you see in the photograph, if it would not be a more reasonable

accounting for what Mr. Ruff saw than the theory which he advanced, the theory that he advanced being that we so laid our pipe that we had one-half on virgin soil and one-half on soil which had been worked over. I asked you to look at that photograph and let me know if in your judgment the digging of that soil is not a more reasonable way to account for what Mr. Ruff found than the theory which he advanced? A. I would say that even though the portion Mr. Ruff referred to were in open trench—now when you come to the construction in the tunnel I think it would be even less.

10 Q. Let us talk about open trench. A. The portion Mr. Ruff referred to was in the tunnel.

Q. I thought he said the whole way across the street or the major part of it? A. I do not remember that but I am having now regard to the tunnel. I will go with you to say if this was the method the foreman adopted and found it worked all right, I will let that go, but I will say I have not seen it done and I cannot see the advantage of it.

Q. You do not doubt the photograph? A. Oh, no.

Q. That looks like what is being done there? A. Yes, that is right. While we are passing this point along McDougall Avenue there were two
20 lines of pipe, a high pressure and low pressure.

Q. That is why I said it was a wider trench, because I supposed it would be for two lines of pipe. A. There was part of McDougall Avenue where one of the pipes was not here, that is the material for the pipeline was not here and the Gas Company got our permission to open up McDougall twice. Now it may be that the photograph as shown here was a portion of their construction where both their pipes were here and they put them in at the same time. If that were the case then the reason for the lower steps on one side might have been to have laid one pipe at
30 a lower level than the other, possibly to take off services and cross trenches.

Q. You know I have been in association with a number of people here and we have tried to find out what happened in 1923 when this pipe was put in. And I do not know much about digging trenches, as you know? A. I think you know quite a bit.

Q. However, we will leave that. Look at the bottom of that trench. I suppose that represents the normal bottom of a trench without back-filling? A. No, it does not, oh no—oh my, no.

Q. What does it represent? A. If a trench is left in that shape it is not a finished trench. The trimmers come along and leave it in good
40 shape.

Q. And you will have inequalities of spade for spade? A. They should be very minor.

Q. Did you ever lay any gas line in twenty foot lengths? A. No.

Q. You have laid a great deal of sewer line in two and one-half foot lengths? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 39.

Albert
Walter
Haddow
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.

Albert
Walter
Haddow
Cross-Ex-
amination
continued.

Q. And I suppose you have laid a lot of cast iron pipe for water lines? A. Yes, and steel pipe.

Q. Running to what length? A. We have had our big feeders running up to sixteen and eighteen feet.

Q. And your water lines are all laid below the frost line? A. Seven and one-half feet cover.

Q. What I have in my mind is this. I so understood you on Saturday, having regard to the plan which I will deal with in a moment, that in passing under a place like this the thing must be so carefully done that all portions of the pipe are going to rest on the trench bottom? A. Yes. 10

Q. I do not think you meant that? A. Oh I would ask that of a careful foreman.

Q. And would not you regard that as properly backfilled bottom? A. No, I mean excavated bottom.

Q. Now I am going to suggest this to you. In this case we have a brickbat and a block of wood. A. Yes.

Q. That is the brickbat here? A. No.

Q. Was it a whole brick or half brick? A. Well I don't think so. I will back up half a brick.

Q. And we find we have drawn eighty feet of welded pipe into that trench? A. Yes. 20

Q. And we are going to stab it into Dresser couplings on either side of the street? A. Yes.

Q. And in order to do that it is absolutely necessary to get an absolute level? A. Yes.

Q. There is no play there? A. Oh there is some.

Q. Well you have to get it as straight as possible as to elevation and direction? A. Very close, yes. But there is—you can allow deflection. A Dresser coupling will allow deflection particularly before the gaskets are put in. 30

Q. We are going to talk about that deflection later on. But in the first place in getting the pipe in you have to have it almost straight. And there is no doubt in order to get that straightness that the person laying the pipe if he could find a piece of this most excellent Edmonton hardwood, poplar, or fir he would use that in order to get his level and you would say that is good construction? A. I think that they really used that to skid it in with.

Q. Take the brickbat. He used that to get his level with. There is nothing wrong with that? A. No.

Q. And you do not know whether they took it in on rollers or not? A. Oh no, that is my supposition. 40

Q. And there are proper iron rollers to carry it in on? A. Well that would be almost as good as a roller.

Q. This piece of wood would be an excellent roller? A. Yes.

Q. And if you were running a job you would not object to a fore-

man skidding it in on that roller. It was sound business? A. Yes, it would help him in.

Q. And we have the pipe level at the other end with half a brick? A. Yes. That shows the position of both the roller and the brick.

Q. On the position in your plan, we find that brickbat which you could well imagine in good construction was used by the foreman? A. It would be, yes.

Q. There would not be anything wrong with that to get a level to stab it into his dresser. That would be good business? A. I think he
10 put that in there to help him skid it through the trench.

Q. The brick? A. The brick he might. He might, as you say, have used the brick to support his pipe there when it was there.

Q. If he had used it you would not have said that was not good business? A. Oh no, not for propping it up.

Q. And having got it level on the brick bat and the wooden piece, if he backfilled that pipe properly you would not have much objection? A. Well there is our quarrel.

Q. You are coming squarely back to this, that it is improper to lay
20 a solid gas line twelve inch, eighty foot long, unless you have it rest on the bottom of the trench? A. I think a long length of eighty foot of twelve inch pipe, subjected as it is under our conditions to strong stresses, I think it is only reasonable for good construction to have a solid foundation.

Q. I will take you a little further. We will say that this foreman in running that open trench in that tunnelling under that street went too low. Say he was the best man in the world and had made a mistake and gone six inches too low? A. Yes.

Q. Then, according to you, you could not in this world lay a pipe in that trench? A. Oh yes, we often do that.

Q. We should have cemented it? A. I am not saying that. For ex-
30 ample, supposing your foreman had found that his trench bottom was six inches too low. I think he could have gone in before he laid his pipe and possibly put back backfilling which would have been solid and satisfactory. My point is that you created an exceptionally difficult problem of backfilling when you took a very small confined tunnel, filled almost completely the bottom third of it, and then expected the workmen to get around underneath that. I think you made a very difficult problem for him or he did for himself.

Q. And we have dug our trench wider? A. No, I would not suggest
40 that.

Q. Our engineering was all right in our trench? A. I would not say it was the engineering. But I think the workmanship of the trench across the street was not good.

Q. For the reasons indicated on your plan, I think? A. Yes.

Q. I come back again and I put this question to you. Say that a man had gone six inches too deep in his trench? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.
Albert
Walter
Haddow
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

*Plaintiffs'
Evidence*

No 39.

*Albert
Walter
Haddow
Cross-Ex-
amination
continued.*

Q. I suggest to you, that pipe may be safely laid on that if properly backfilled to that depth. Is that a fact? A. Please repeat that.

Q. If properly filled, his pipe may be laid to length in that trench?

A. Yes, I will agree with you.

Q. I say if properly backfilled. A. My explanation here two or three questions back was quite explicit on that.

Q. This fifteen-inch main which you have now got to twenty over all—outside dimensions. How wide was your trench? A. My trench is twenty-six to thirty inches wide.

Q. You have got three inches on either side of your pipe. You have got ten inches above it. Can you properly backfill that? A. The problem of backfilling there between the two ends you suggest is absolutely different. Here is the problem you have put up to your foreman. You have a trench with a long pipe in it. That is, there is no end in it at all. As far as the foreman is concerned with or can do, he would endeavor to cut around the side and the bottom. The problem we give to our man is he comes out with short lengths of pipe two and one-half feet. He exposes the end of this pipe and he has the full width of the tunnel to work in and the full face exposed. His problem is absolutely different and simple. This man has as much chance here to fill this here as to fill the piece below the lower portion as he has to fill the piece above the pipe. 10

Q. In this tunnel of yours there is no room for a man to put a spadeful of dirt alongside your pipe. He must backfill from the top where he has a maximum of ten inches. Now follow me. You have a twenty-one inch pipe in there which gives you two and one-half inches on either side and you have a ten-inch clearance? A. Our trench is twenty-six and two-thirtieths inches. Now if we get one extreme I think we should take both. On the other extreme you get seventeen or eighteen inch pipe in a thirty inch trench. Now there is the other side. Now that bell is only a matter of four inches long. That is, it is just a portion of the pipe. 30

Q. It does not matter what it is if you have to put a spade back, whether it is an inch or one-eighth of an inch. A. Oh yes. Now two and one-half feet is a short distance. A man is right in touch with his work.

Q. Your inspector says he does it two lengths at a time, so you have to carry it five feet? A. Yes and you have tampers in there. You have the full width of your tunnel to work in.

Q. It is twenty-six inches? A. Thirty-six inches high and from twenty-six to thirty inches wide and he has the full cross section of the tunnel in which to work without the interference from the long length of pipe. 40

Q. Now let us go to the gas pipe. And you have the full width to work in and you can work from the top. Which is the easier way? A. I would say work from the top with an open cut, as against tunnelling.

Q. So you have no doubt whatever that where we have open cut in this street we are in a position to backfill our pipe better than you were

in your sewer tunnel? A. No. We are back to the same proposition. In your open cut, even there you have to work from the top. I think your man can make a fair job. You cannot use a long instrument because if you take the line there you cannot have these meet.

Q. What you have got is the power of your spade or shovel?
A. Yes. And I have no quarrel with that method of tamping in an open cut but as to whether it is better than tamping from an end I won't agree with that.

Q. We will perhaps agree to disagree? A. Yes.

10 Q. There are two men still in your employ, Barner and Denmark. They are still available? A. Yes, sir.

Q. They did this work? A. Denmark did the brick work. I have a statement here both from Mr. Denmark and Mr. Barner.

Q. I was merely asking you if these men are available to be brought here if necessary? A. Yes I think they are.

Q. And one is the man who did the brick work and the other was the foreman in charge of the construction of the tunnel? A. Yes. Denmark also was on construction. I think a fellow by the name of Evanson was foreman of that. The bricklayer was Denmark and the bricklayer's
20 helper was Barner.

Q. I was under the impression he was a sort of straw boss. A. He is set out here in my memorandum as bricklayer's helper and Denmark is put as helper. They are both in the city.

Q. You are not suggesting that we built the tunnel very much narrower than we did our open trench? A. Oh no.

Q. And to get down to what might be quite important. I suppose you will agree with me that, what you have said about frost will have equal application to other parts of our system—frost stresses? A. Yes I think that is correct.

30 Q. And I suppose you will agree with me that this weld lasted for eight and a half years under 107th Street? A. Yes.

Q. And I suppose you will further agree with me that this weld broke because of the theory which you have advanced, which I understand is a failure to lay the pipe to grade—inferior backfilling and—
A. And axial stresses.

Q. I am speaking of the extra things—the straws that break the camel's back? A. Yes.

40 Q. That this weld, as opposed to other welds which are subject to similar stresses, broke because of our failure to run to grade and inferior backfilling? That is your idea? A. Yes I think those are contributory factors. You were saying that the weld had been in eight and a half years. That is correct. I do not know whether it is opportune to say to you that I think the stresses developed progressively from year to year. That is, if a structure goes through one year, the peak condition of one year successfully, it does not necessarily follow it goes through succeeding years.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.

Albert
Walter
Haddow
Cross-Ex-
amination
continued.

You said the weld had been in for eight and a half years. I make that explanation because I believe that the action which I have tried to explain as it appeals to me is developed progressively from year to year.

Q. I am going to suggest this to you, that where pipeline companies have troubles with broken welds, ninety-nine per cent. of them develop within the first year? A. I can quite believe that. That is proof positive that if it had not developed in the first year it developed soon after.

Q. I am saying that when we come down to experience with broken welds in pipeline companies, that ninety-nine per cent. of them develop their breaks in the first year? A. Yes. 10

Q. You have got your round of temperature changes? A. Yes.

Q. And this pipe has had that same round of temperature changes for eight years? A. Yes, but I still maintain—

Q. Oh, don't think I am going to expect you to maintain anything else. But so far as frost effect and the bond of the ground and the excess bond during frost—that we have had that year after year for eight years and we did not break our weld? A. Yes it has gone the cycle with varying extremes.

Q. And there is no difference in the differential or appreciable difference in the year we broke and in others? A. Oh yes, there is a very great difference between frost action one year and another. 20

Q. What I am saying is this, now let us get clear about frost action. We were not suddenly hit with a drop of sixty degrees all in one second in our pipe? A. No.

Q. In other words, the drop in temperature was a gradual thing and when the frost bound us the degree change was very light. A. Yes. I am thinking of the frost surface going down. Now that does not go down quite so steadily as you say. It depends entirely on our atmospheric conditions.

Q. You are talking of the wet carrying conditions? A. No, the depth of frost going in the ground. That is almost entirely a factor of the seasonal temperature. I was going to say this by way of explanation. You might have an inch of frost go into the ground and by virtue of several days warm weather that frost will come out. Supposing, on the other hand, you had an inch of frost go into the ground, followed by a week or ten days extremely severe weather, the frost line goes down in the same direction. 30

Q. Is there any difference in the year's scale of temperatures when the pipe broke and any other year? A. Oh no.

Q. When you get moisture concentrated in certain spots you speak of them as frost boils? A. We do not have any frost boils. 40

Q. Well when you have excess moisture your frost comes to the surface and pushes up? A. The only thing we have had that you can call a frost boil at all—

Q. But is not what I have said to you generally true as to frost action? A. Yes I know. In eastern construction they have quite a bit of

trouble with frost boils due to excess moisture underground but we have none of that at all here. We never have any of that.

Q. Now look at Exhibit 28. Now as I understand your theory, you have a point where you say the three inch diameter block of wood found here supporting the ten inch gas main, that is to the left—"the twelve inch gas main was found to be resting"— A. Yes.

Q. And then on the other side we find our friend the brickbat and you say "at this point the twelve inch i.p. gas main was supported on a brick."? A. Yes.

10 Q. The distance between those two points is thirty-eight feet?
A. About thirty-eight feet.

Q. And the theory which you have given to the Court, as I understand it, is that that constitutes a beam? A. Yes. My analysis was made on the basis of a beam with uniform lying load.

Q. And there is no doubt at all that in your view the support of the pipe in those two places had to do with this breaking in the centre?

A. I am not putting a great deal of weight in my own mind on the support that was given the pipe by the little stick of wood and the brick. I mean the brick quite obviously—one being three inches and the other
20 four inches—they would not support that.

Q. Well I am glad you say that. A. You cannot in point of fact support it. I would say this, that you would not expect to find bricks and sticks underneath, in good construction.

Q. Now do not accuse us of not having this thing prettily done. May I discard the theory I understood you to give us yesterday, namely, that we have fixed ends and a brick and stick and a thirty-eight foot beam between? A. I am sorry if I—

30 THE COURT: If you two professional gentlemen will try from now on not to interrupt each other, in the middle of sentences at least, it would be better. I know the Court Reporter has great difficulty in finishing either your questions or your answers. Perhaps it would be just as well if the witness was not too apprehensive about what the question was leading to. I am sorry to have to say that.

MR. SMITH: I am grateful to Your Lordship. I am guilty of things like that. I think perhaps too much enthusiasm is the reason.

THE COURT: Yes, too much enthusiasm from both ends I believe, and I am in the middle of a beam, you see.

MR. SMITH: You will observe your brick and stick are both resting on what I may describe as undisturbed soil? A. Yes.

40 Q. In fact, to some extent they have penetrated that soil? A. Yes, sir.

Q. Am I right? A. Yes.

Q. And looking at your stick you will observe that you found backfill above that stick in between the stick and the pipe. Look at your plan. A. No, I think that the full yellow line is directly above the stick. You may be looking at that broken yellow line just above it. That is the ten inch.

Q. Perhaps I had better show you my blueprint. Perhaps I had better look at your plan. What I am pointing out to you if you will look at your stick here, I am suggesting to you that your backfill there is backfill between the stick and the twelve inch pipe and it was so found when you and Dr. Cameron discovered it. A. I do not remember that. No, I 10 don't remember that.

Q. And your position is this, that you do not remember when that pipe was lifted in June whether the twelve inch was resting on that stick or there was backfill between the pipe and the stick? A. That is the way I do remember it, that it was resting on it.

Q. Are you sure of that? A. Yes, I feel quite sure of that.

Q. And you will at least observe in the blueprint with which I have been supplied, it quite clearly shows backfill above that stick. You might look at my blueprint? A. The broken line is the ten inch. This line I am pointing to now, the full yellow line, that is right down on the stick. 20

Q. I can see hatching above that? A. Oh no, I think it was right on the—

Q. If Mr. Haddow says it is not there, that ends it. A. Just to be good and sure about that, I would like to refer to our original field note because if you are right I will be glad to say so. May I refer to my original?

Q. You may to refresh your memory but I do not want you to read them to me. A. Then I would say that my memory is correct, that the pipe was resting on the stick.

THE COURT: It looks as if Mr. Smith were right as far as the 30 blueprint is concerned, but the plan— A. A blueprint of a tracing must be absolutely the same.

MR. SMITH: Now I want you to look at this stick which has been produced here as the one resting under that pipe. I suggest to you that if that pipe were resting on a stick for eight years or any appreciable time you would find the mark on the stick there and it is not there? A. Well I am marking the place "X" which I think was the surface the pipe was resting on.

Q. This pipe was covered with black paint, wasn't it? A. Yes.

Q. There is no question that if that pipe were resting on that stick 40 you would find some black paint on it unless the paint was eaten up in the meantime? A. I would not say that was absolutely necessary.

Q. I am putting this to you, Exhibit 26 gives you nothing—gives you no assistance in supporting your theory of the pipe actually resting on the stick itself. A. Not by any paint mark.

Q. Nor by any mark of any description that you can discover?
 A. As I said I marked a place "X" on the stick where I think there is some indication of it.

Q. The point that you have marked "X" is the only indication that you can find of our twelve inch, quarter inch, diameter pipe having rested on your stick Exhibit 26 for eight years? A. That is my memory.

Q. It has slept there like a child on a downy pillow? A. Yes, "downy pillow" is just what I have been trying to say. "Downy pillow" is right.

10 Q. Now I want you to look at your plan and I want you to take first the line of the city's conduit box. On mine it is not clear, but I want you to take the height below. What do you call these cross lines? A. Datum lines.

Q. I want you to take your conduit box below the Datum line next immediately above it and at the edge of the street which is marked south property line of lane, that is on the lefthand side of your plan? A. Yes.

Q. I suggest there that you show that your conduit box is six inches below that Datum line? A. It is six inches below Datum line elevation two hundred and thirty.

20 Q. And follow your conduit box to a point immediately above the break and I suggest it is there twelve inches below the Datum line two hundred and thirty? A. Yes, sir, you are correct; which would give you elevation of two hundred and twenty-nine.

Q. In other words, there is a drop in the conduit box from the side to the centre of the street or to the break in our pipeline near the centre of the street of six inches? A. Yes.

Q. And if you will follow your conduit box through to the other property line you will observe it comes back there to really what it started with—some six inches? A. Yes.

30 Q. And if you will look at our ten inch line, I am not speaking of the broken line. A. This will be the dotted line—you will observe that just about the brick it comes, almost touches our ten inch line?

Q. You are referring now to the bottom of the conduit box? A. Yes.

Q. And you will find an almost exact following of that twelve inch line to the south property line? A. Yes. It will probably give a better reference if you read at the top.

40 Q. I am speaking of the property line on the street. Now then if you will observe the gas company's ten inch line from property line to property line, there is a subsidence in that line. You will observe that? A. Yes, it is what we would call a sag.

Q. And we have learned that it came to rest on the old sheeting showed around manhole "A"? A. Yes, sir.

Q. So there is not much doubt our ten inch line was on its way down with the twelve inch, had it not come to rest on the sheeting in manhole "A"? A. I do not know what the original elevation was. My examination

*In the
 Supreme
 Court of
 Alberta*

Plaintiffs'
 Evidence

No 39.

Albert
 Walter
 Haddow
 Cross-Ex-
 amination
continued.

of that sheeting indicated the top of the sheeting had been cut off with an axe or a saw and I remember at the time thinking that the ten inch had probably been actually laid at that point and that this cutting had been done in order to accommodate it.

Q. You said yesterday that you found it resting on the sheeting?
A. Yes.

Q. But you did observe a sag in that pipe and the lowest point in that sag or at least a point equally as low as any other is the point in that sheeting? A. I am sorry—

Q. I am saying an examination of your plan shows, having regard 10
to the sag in our ten inch line, the point where it is resting on this sheeting is an equally low point with any other point in our line? A. Yes.

Q. Then you will observe, as I stated, the very close falling parallel, in sag, of the conduit box with our ten inch line? A. Yes, sir.

Q. Are you going to suggest to me that that parallel could possibly be there so exactly if both of those lines, that is the ten-inch and the box had not to some extent subsided together? A. Oh yes, I see no difficulty in that.

Q. Are you going to say that it was the extent of the not constructing the conduit box to grade, that lack of meticulousness could give you 20
that parallel? A. No.

Q. What is the explanation? A. I think the explanation is it is there.

Q. And I think that is the best explanation too. A. As a matter of fact there is an actual difference just as you speak about the fracture is the fracture of one and one-half inches and it goes up as you can see and then goes down and then rises above the ten inch. It really does not follow quite so close as you described by meticulous.

Q. Oh yes, it was a miserable old box. It was crooked when it was put in? A. Yes. 30

Q. It was a little snaky all the time? A. Yes.

Q. And all you are doing is showing me the little wiggles that were always there? A. No, but your suggestion is that the pipe and conduit were laid at the same elevation and have both subsided.

Q. Granted the ten-inch line and the twelve-inch line were both laid to grade—do you follow me? A. Yes.

Q. And had there been subsidence at 107th Street you would anticipate just such a result as this? A. On your hypothesis. You know they were not laid at the same time, don't you?

Q. Oh I know. We did not backfill your boxes. A. You know that 40
the ten-inch and the twelve-inch were not laid at the same time.

Q. I know that. And I also know that the twelve-inch line lies between the box and the ten? A. Yes.

Q. I have helped you there, haven't I? A. Yes you have. I have thought of that myself.

Q. You mean you would have sooner or later. Now I am going to ask you this question. Since frost stresses are more or less of an equality on all sections of our plan, that is similar soil in this city, I think you are going to agree with me that this weld broke either for the reasons that you have given or because there was some subsidence under our pipeline under 107th Street. You will go that far with me? A. If you wish to include the subsidence all right, I do not admit it, but also possibly because of the weld itself.

10 Q. Separating the weld. That stood for eight years? A. Yes.
Q. Something let it down. Bad as it was, it stood for eight years?
A. Yes.

Q. I think you will agree with me—and we can eliminate a lot of nonsense if you do—you will agree with me that that weld broke for the reasons you have given me, that is laying our pipe off grade. In laying it on the bottom of the trench—I am leaving out frost because that breaks out everywhere, or because there was some subsidence in 107th Street underneath our pipe. We just have the two things to go on, haven't we? A. No we have not.

20 Q. Well what other? A. Well I don't know when the frost was eliminated. I have not eliminated the frost condition.

Q. Well let us keep the frost in? A. Yes, sir.

Q. Then you will agree with me in this, that frost action plus failure to maintain grade, plus poor backfilling, that either broke our pipe? And the other one is a failure of support beneath our pipe on 107th Street A. That would cause it, that would cause it alone or in combination with what I have said.

30 Q. And what I am coming at is this, there are two causes that may have done it. One is a failure of support under our pipe on 107th Street and the other is the reason you have given—lack of care, poor backfilling, and frost action? A. And the weld itself.

Q. Leave that out for the moment. I am speaking of — the weld would have held forever and ever if there was no pressure on it? A. I think so.

Q. Well we are both together now? A. Yes that is true.

Q. And there is no doubt at all the city went under our pipeline in 1931? A. That is true.

Q. And they went under that pipe with an excavation of the dimensions you have given us and an additional front on that weir box as exhibited in Exhibit 30? A. Yes.

40 Q. Do you think it is good engineering practice to go with a three foot tunnel, three by thirty, joining up with a weir box—by the way I think you quite agree with me in the construction of that weir box the excavation was big enough for a man to stand in? A. At the weir box the excavation was about forty-two inches wide five foot six inches high at the back of the manhole.

Q. And that was the sort of excavation you made under our pipe?
A. Yes, sir.

Q. And looking again at your model, our pipe broke almost directly over that major excavation? A. Yes.

Q. That is true? A. Yes that is true.

Q. And that was that same pipe and that same weld which stood there for eight years without breaking? A. Yes, sir.

Q. Now I am sure that when you found that we had a broken weld there that one of the thoughts that occurred to you was, as a scientific man, it might have been because of the disturbance beneath it? A. It came to me by suggestion and the suggestion came to me from Mr. Garrett. 10

Q. And you were not surprised, as an engineer, to hear it? A. I was not surprised at Mr. Garrett looking through all the possibilities.

Q. I am asking you to speak to me now as a scientific man.

THE COURT: And assume for the moment Mr. Garrett was not interested in making suggestions.

MR. SMITH: Here is my question. You are a scientific man, you see—you are not the city engineer—you find that a gas line, a twelve inch line, is broken at a weld which has been in the ground for eight years. You find that in the previous year at a depth of roughly seven feet this excavation had been made beneath it. And I suggest to you that as a scientific man the first thing that occurred to you was—was that excavation responsible for the break? A. I would consider it as a possibility, certainly. 20

Q. It is the first thing to think of. A. No it was not the first thing I thought of.

Q. I am asking you to divorce yourself from all intimate knowledge of this construction. Didn't it occur to you that there might be something wrong even with all that knowledge? A. No, I say to you quite frankly that under the actual circumstances as they arose I did not think of that storm sewer construction until it was suggested to me. 30

Q. And I am commending you rather than blaming you. You got busy to see what investigation you could make in that area to support the opinion you had then formed? A. I must say to you I had not formed an opinion as to the cause of that fracture. Even in my report to the city commissioners and council I said I did not know at that time how the fracture had happened.

Q. You would not report to the city commissioners or council anything about it until you were sure? A. We try to make our reports as accurate as possible. 40

Q. But with such a body as that you would be careful?

THE COURT: Perhaps you would take it that the degree of care he is exercising in his answers would indicate that.

MR. SMITH: Now I want you to go into this somewhat theoretical case. Say we have a pipe like this rolled up Exhibit 20, and the pipe is laid in the ground three feet below the surface A. Yes.

Q. And someone has taken my support from underneath it and where you see "28" is the place of my weld? A. Yes.

Q. And support has been taken away directly beneath that figure 28, the place of my weld? A. Yes.

Q. That means that your pipe, granted there has been a subsidence—subsidence is right? A. Yes.

10 Q. Granted there has been subsidence then the pipe is left to carry away vertically—the minimum weight is carrying this line vertically to the surface—that is the minimum weight that pipe carries? A. Yes.

Q. But we know that it carries more than that, don't we? A. Yes.

Q. And it may be anywhere—we know it is more than the vertical piece of pipe and we know it is less than the horizontal. In other words your pipe will go as your hand illustrates. It may be forty-five degrees? A. Yes.

20 Q. And does that combined to the weight which culminates in strain and ultimately fracture—I am speaking of the theory of what may happen to a pipe if its support is taken from it in any degree. You go with me in that, don't you? A. Oh yes I agree with you.

Q. What is the action of water where we have voids created in the ground. What does it tend to do? We will assume we have done some backfilling? A. We are still in theory?

Q. Yes. Take a weir box down in Calgary and we have not properly backfilled? A. Yes.

Q. What is likely to happen up above? A. Well you speak of, if you have not a solid arch over your excavation, if it is loose material then I think that material would come down.

30 Q. Earth does come down? A. Yes, it goes down.

Q. And you can take a mine which is hundreds of feet under the solid rock and the tunnel driven in, we timber that tunnel heavily to hold up the solid rock? A. Yes.

Q. Because the roof would come down if it is not supported? A. Yes.

Q. You have been through quite a few mines? A. Yes.

Q. Timbering is one of the biggest expenses they have got. A. True.

Q. And the timbering is done to hold up a solid rock roof? A. Yes.

Q. So even solid rock will move? A. Yes.

40 Q. And I am suggesting to you that the water, the soil becomes impregnated with water in seeking to escape, it will follow pipes imbedded in the ground, it will go along outside the pipe sweeping its way? A. Am I still agreeing with theory in Calgary?

Q. Theoretically? A. Yes that is true, if it has a free passage, yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.

Albert
Walter
Haddow
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.

Albert
Walter
Haddow
Cross-Ex-
amination
continued.

Water will follow the path of least resistance down hill.

Q. And supposing I were down in Calgary and I had a situation something like that model shows and I had a lot of water in the neighborhood of this manhole, my gathering of water would be in the neighborhood of this pipe and this weir seeking to follow that pipe down? A. I want to know when we leave this theory, because I do not intend to mix up theory too much with this.

Q. Oh I am still in the theory. A. What was the question?

Q. We have a manhole and a weir and a lot of water and I am suggesting to you that in ground impregnated with water that that water will seep and find the outside of pipelines and endeavor to escape along the outside of those lines? A. If it can permeate through, yes. Of course it is not up to me to find out what we are developing or anything like that. I would like to know the premises on which we are arguing. 10

Q. THE COURT: One of the premises is that this case is not one between the gas company and the city, that is at least one at the moment. Now take the theoretical questions in the same manner you have heretofore done in any case I have had before me. Take these theoretical questions and answer as best you can. Mr. Smith is getting away from the grade situation here and I understand what the cross-examination is about and I advance there is a difference between the theory you are advancing and the theory which will be advanced by experts for the defence. Now try and treat this as supposititious. A. My difficulty in making answers is the premises are not fully given. 20

THE COURT: But you are here as a scientific witness fully qualified, and, as far as I am concerned, with a great reputation for fairness which I hope you have not dispelled at all. But Mr. Smith is now on theoretical scientific subjects which he wants answers to. We will find with relation to the facts of this case later when we come to it. A. I do not wish to become obstinate but Mr. Smith is developing a line of argument involving conditions at Calgary with entirely different soil conditions. Now the problem Mr. Smith is asking me as a scientific man—well a scientific man, it seems to me, should know pretty nearly exactly the premises of the problem. 30

MR. SMITH: Well in any kind of soil in which there are pipes—any kind of soil which has become sufficiently impregnated with water, is it not a fact that that water will seep to the outside of pipelines presently laid in an effort to escape? A. Oh I am sorry to give not a definite answer, but sometimes it would and sometimes it would not. Now that does not mean anything because there are cases where it would follow a pipe and there are other cases where it would not follow the pipe and it would simply go off into the ground. 40

Q. Take the situation under a pavement. Would that effect what you are saying in any way—soil under a pavement? A. We are dealing with soil, no matter what is on top of it.

Q. I wondered if that is what you had in mind when you said sometimes it would and sometimes it would not? A. I am taking now the answer to the question which Mr. Smith asked me if water is introduced in the soil that is underneath the pavement. That has nothing to do with it at all.

10 Q. We will say that this soil is impregnated with water. I am saying this to you, granted we get a sufficient impregnation of water there is no doubt at all that that water will seep along this pipe and endeavor to go down with that pipe to manhole "B." Is there any doubt about that at all? A. Yes, there is a doubt about it; very considerable too.

Q. And what is it? A. Well, I would say that a well backfilled tunnel with clay, if there is a surplus of water it would not follow the pipe but would follow if it can follow at all the top of the backfill underneath the cut tunnel.

20 Q. You mean if it is so backfilled that the water cannot reach the pipe it will then follow the top of the tunnel? A. If there is an excess of water as you suggest I would say that is the probable course.

Q. But you did find, Mr. Haddow, that in the front of this weir chamber and that is in the direction facing towards manhole "B" there was a space, a cavity. On your plan you say that it was twelve by twelve by two? A. Which hole?

30 Q. The one, speaking of the left hand upper side of the plan, filed as Exhibit 28. A. I am reading now from Exhibit 28 and that is a note in the upper left hand corner in connection with the storm over-flow: "On July 8th, 1932, at the request of I. F. Morrison a section was opened out "of the wall of manhole "A" about twelve inches high and immediately "above the roof of the weir chamber, the dirt removed was in its original "state and there was no evidence of any settlement. A hole about twelve "inches wide, two inches high and about twelve inches long was found im-"mediately above the junction of the fifteen inch tile and weir chamber."

Q. What you are saying is, and looking again at our model Exhibit 30 and imagining another foot on this weir chamber, that at the junction of the pipe and the weir chamber you did find a hole twelve by twelve by two inches—a cavity? A. Twelve inches wide, twelve inches high and twelve inches long.

40 Q. In other words, it ran over the pipe in the direction of a foot crossways and two inches high? A. That is right, yes.

Q. Which indicated very clearly to you just what? A. It indicated that the backfilling in the tunnel had settled two inches at that point for a distance of twelve inches. And did not include the other portion of that that I read—that the original ground that was taken out—"the dirt removed was in its original state and there was no evidence of any settlement." That is important.

Q. Now on this occasion when you say at the request of I. F. Morrison—that is Professor Morrison who is advising my friends? A. Yes.

Q. You went in and made this cut and found this hole twelve by twelve by two? A. Yes.

THE COURT: When was that done?

A. On July 8th and 9th, 1932, we made two inspections.

MR. SMITH: I am making this suggestion to you, that prior to the time that you and Professor Morrison found that hole, namely, on the 7th day of July you were there with Professor Morrison and Dr. Cameron? A. Yes on the 7th or 8th. 10

Q. And that was the day before you indicated the hole in your manhole above your weir chamber. That was the day before? A. Yes that is right.

Q. And you were there with Dr. Cameron on that day? A. Yes.

Q. Dr. Cameron went down the manhole and he went into the weir chamber? A. Yes. I think we all were down in the weir chamber.

Q. Now I am showing you something. That is all I am going to call it at the moment. I show you what you will perhaps tell me is a fair representation of manhole "A" with weir chamber attached? A. Yes.

Q. And would you look at the inside of it and tell his Lordship 20 whether the weir is there properly shown so we can find out what a weir is? A. Yes. This is the hole that goes out. Towards the left hand side is the ordinary sewer which runs up and down the lane.

Q. Now show that on model 30.

Model of manhole "A" and weir chamber marked Exhibit 39.

(Witness refers to Exhibit 30): I am explaining model 39 which is a secondary model of manhole "A" and the weir chamber. The sewer which runs east and west along the lane south of Jasper is represented at the bottom of the manhole. The catch basin lead going to the southwest corner is represented near the top. The catch basin lead going to the 30 northeast corner is represented below the last we mentioned and in addition there would be a sewer which goes along 107th Street which is not shown on the model. The model shows also the construction of the weir chamber for storm overflow. This comprises a chamber of the dimensions shown on plan Exhibit 28 and between the weir chamber and the manhole is shown a raised weir which is the weir into which the storm sewer water overflows in periods of congestion of the regular system in order to get into the storm sewer system, and it leaves in the model referred to—it leaves by the sewer which is represented by the hole in the end of the weir chamber and thus finds its way to manhole "B". 40

Q. I also have a cover. A. And there is represented also the frame and cover of the top of manhole "A".

Q. Now you have told me that you found a settle above the twelve-inch line of twelve by twelve by two? A. At the manhole running to nothing.

Q. And that would just be above the hole in the weir chamber leading to manhole "B"? A. Yes.

Q. Into which the fifteen inch tile sewer goes? A. Yes.

Q. Now I was asking you if on the 7th of July you had not been there with Dr. Cameron and Dr. Morrison and you said you had? A. Yes, I think, as my memory serves me, an inspection was made yesterday
10 and today, that is July 8th and 9th. It is not material at all, but just to have it accurate.

Q. The only point that is not clear as far as I am concerned with is, I am coming to the end of your plan. "On July 8th in connection with the request of Mr. Morrison a section was opened out of the wall of manhole "A" about twelve inches high and immediately above the roof of the weir chamber, the dirt removed was in its original state and there was no evidence of any settlement. A hole about twelve inches wide, two inches high and about twelve inches long was found immediately above the junction of the fifteen inch tile and weir chamber." I am suggesting
20 Dr. Cameron was not there at all? A. No. I think Dr. Cameron was with us on the previous day, that is July 7th.

Q. What I am coming at it this, Mr. Cameron was not there when you opened the manhole above the weir chamber and found this solid dirt you speak of? A. No, I don't believe he was.

Q. But what you did do on the 7th of July when he was there was to open a hole in the weir chamber above the pipe which leads to manhole "B"? A. No. I think what we did on the first day was to make an opening on the upper southeasterly corner of the weir chamber.

Q. What I am speaking of is the opening that still appears there
30 that was made about the centre of the weir chamber and above the sewer line running from manhole "A" to manhole "B"? A. Yes that is true. There were two openings made. On July 7th an opening was made in the upper southeasterly corner of the chamber and then a further opening was made from the inner face of manhole "A" just above the concrete roof of the weir chamber.

Q. Those were on different occasions? A. Yes, sir.

Q. THE COURT: The latter one being the one that is indicated on the plan Exhibit 28? A. Yes.

Q. The earlier one not being mentioned on the map? A. Yes.

40 Q. These two gentlemen are professors of the same University?

MR. SMITH: Yes.

THE COURT: I hope there will be no difference in their statement as to what they saw?

MR. SMITH: I do not think there will be, sir.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.

Albert
Walter
Haddow
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.

Albert
Walter
Haddow
Cross-Ex-
amination
continued.

Q. I am asking you if on that occasion when Dr. Cameron entered into this weir chamber, if he did not call your attention to a hole in the front of the weir chamber, that is a cavity in the dirt in front of the weir chamber—didn't call to your and Professor Morrison's attention a hole in that area. On this 7th of July, remember? A. Now I will have to go back again. There is some confusion.

Q. I want to frankly give you my information and that will probably clear it for you. The information which I have is this, that on the 7th of July, that is before any hole was drilled above the weir chamber at all there was a hole drilled in the face of the weir chamber above the pipe 10 which leads to manhole "B"? A. That is right.

Q. And that he after investigating that hole called your attention to it. Did he do it? A. We both saw it.

Q. And I suggest that on that occasion, set there, he reached through with his forearm and with a fourteen inch hammer and could not reach the top of that cavity? A. That was another occasion. That was at an occasion in which we reached up here in this old manhole between the old 1917 sheeting and the old manhole.

THE COURT: Another occasion as distinct from what? A. On the first occasion as I recall it we gave—we opened the top of the weir 20 chamber and I found here there was a cavity on the upper right hand of the weir chamber which extended between the outer face of manhole "A" and the original sheeting which was put in in 1907. This appeared to extend up to about the catch basin lead which serves the catch basin at the northeast corner of 107th Street and the lane south of Jasper. Now I think that is the inspection Dr. Cameron is referring to where you say "hammer was put up."

Q. What date did you say that is? A. I will read my memorandum.

Q. I would just as soon you did not read your memorandum. Look it over and give us what information you can? A. With regard to dates. 30 On July 7th the opening was made and on July 8th the first inspection was made.

Q. And who were there? A. The first inspection, if my memory serves me correctly, there were besides myself, Mr. Cameron and Mr. Morrison.

Q. The opening you speak of was an opening where? A. The first opening was made in the upper southeasterly corner of the weir chamber. Now we will come—

Q. You might point to that on that model Exhibit 39. A. The upper 40 southeasterly corner would be indicated on the model Exhibit 39 by a mark "X." Now on that day an inspection was made by that method and Mr. Cameron and Mr. Morrison were there besides myself. That opening revealed a cavity between the old back sheet piling of manhole "A" and the face of manhole "A" which extended from the top of the weir chamber to just underneath the lead that runs to the northeast catch basin.

MR. WOODS: Are you speaking of the second inspection now?
 A. No, I am speaking of the first inspection. My memory of that is that there was a cavity about twenty-four inches long running from five inches to zero on the inside of the sheeting and that the tunnel roof was intact. Now on the—

*In the
 Supreme
 Court of
 Alberta*

Plaintiffs'
 Evidence

No. 39.
 Albert
 Walter
 Haddow
 Cross-Ex-
 amination
continued.

Q. MR. SMITH: Now let us just stop there. You might show his Lordship. I do not know whether your Lordship saw where the cavity was indicated? A. Running from this lead on Model 30 down to the roof of the weir chamber along the northeast, but between the old sheeting which has been shown in evidence upon which the pipe rests and the
 10 face of the manhole itself. That is it did not extend outside the sheeting.

Q. But the sheeting came down to the top of the weir chamber?
 A. I don't remember that. I don't remember that.

Q. Let us put it in this way. When you went in the next day and broke a hole through the manhole above the weir chamber you found earth? A. Yes.

THE COURT: Who were present the next day? A. On the next day after our men had phoned me I think just Professor Morrison and myself. I don't think Mr. Cameron was there.

Q. MR. SMITH: I want to make this plain, that having marked
 20 "X" on the northeast corner of the weir chamber where your hole was made and having a cavity running up to the lead which you indicated, the earth which fell from that cavity, if earth did fall, would come on the top of your weir chamber, wouldn't it? A. It looked to me as if that cavity was there before the weir chamber was constructed.

Q. I did not ask you that. A. But that is my observation.

Q. If earth had fallen from that cavity it would fall on the top of the weir chamber? A. Yes, providing it had not fallen before the weir chamber was made.

Q. I said if earth fell from that cavity after the weir chamber was
 30 made? A. Oh yes there is no doubt about that.

A. So that the fact that you found earth when you poked your rods through might be accounted for by the fact that the earth had slipped along the cavity? A. Oh no, not by any means.

Q. Why? A. You can tell exactly what the earth we found on inspection of the hole was and I am saying to you very definitely that I think the cavity we found between the manhole and the sheeting had existed there prior to any sewer construction.

Q. I did not ask you about that. You volunteered it? A. Yes, and
 40 that is what happened.

Q. And you found two cavities in the neighborhood of our pipeline. Did you find any more? A. That is only one cavity up to date. The next day we opened the manhole here (indicating) that is in the manhole itself, and made an inspection of the tunnel above the pipe.

*In the
Supreme
Court of
Alberta*

*Plaintiffs'
Evidence*

No 39.

*Albert
Walter
Haddow
Cross-Ex-
amination
continued.*

Q. It was just a visual inspection you could get there? A. No, we did not make it large enough to get in. The hole was not more than fifteen or eighteen inches square.

Q. What did you open in order to observe that hole above your fifteen inch pipe? A. We opened the wall in the manhole.

Q. And looking from there with a torch you could see a hole above your pipe? A. I found that the backfilling had settled one and one-half inches from the old tunnel excavation and I had difficulty in shoving a three-quarters by one and one-half wide stick into that hole.

Q. You found a hole there twelve by twelve by two inches, or did 10
you not? A. No, we did not.

Q. Well on the third inspection perhaps? A. Well they were the only two inspections.

Q. Well if there is anything more to be said about the hole will you let me have it now? A. No, I don't think so.

Q. Did you at any time find a hole twelve by twelve by two inches? By hole I mean a cavity? A. Yes. The note on Exhibit 28 refers to the second inspection.

Q. That is a correct note, is it? A. I think so. Although I notice a difference, that says twelve by twelve by two and I speak here in my 20
memorandum, oh yes, I put one and one-half inches. I took a three-quarters by one and one-half stick, the only difference, his plan says two inches.

Q. Well it is your plan. A. Yes, I will stand by that. Half inch out, I do not think will make—

Q. Well we won't quarrel about that. So we can straighten that out by saying your inspection showed you two cavities beneath and in the neighborhood of our plan? A. As explained.

Q. And I suppose it is reasonable to suppose that cavities do not always remain in exactly the same place under ground. The cavity does 30
not move but earth sometimes fills them and the cavity is then gone? A. Yes.

Q. And if that happens the place from whence the earth came, itself creates a cavity? A. Well the cavity which you are describing is usually filled by earth, if it is moving at all, dropping off the top and this loose fill falls into the cavity space and very often that expands it, well does partially backfill the cavity but that is the way they rise. They simply scale off the roof.

Q. Did it give you a bit of a shock to find this cavity? A. No, it did not. 40

Q. After Underwood's description would not you be shocked? A. No. My reaction was one of complete satisfaction because the top of the tunnel was absolutely solid, not a sign of a move on it.

Q. That is so far as you could see from where you were? A. That is correct, which would take us outside the pipe.

Q. How much earth did you take out? This inspection of the top of the tunnel you are telling me took place from what point? A. From the manhole up to the weir box.

Q. So you are looking out over a weir box which extends three feet in front of you? A. Yes.

Q. And we have no brilliant daylight down there, it is a dark spot until we light it up? A. Well it had to be artificially lighted.

Q. And you had your head and shoulders above the manhole and your vista was over this three feet of weir and down over the top of the pipe? A. Yes, a view over and then surrounding the material.

Q. But you could not see very much? This hole was not very big? A. The opening had to be made a fair size over the weir chamber.

Q. Did you dig out here over the weir chamber? A. Yes.

Q. And how much of an excavation did you make there? A. Oh I suppose we took out about two feet in width and at least two foot high round in an arch form running down to and—

Q. And you did from— A. From manhole "A".

Q. And you did that from a hole what size? A. About fifteen or eighteen inches square.

Q. And having taken this dirt out from in front of the manhole you were able to see down from the top of the pipe? A. No, a tunnel above the pipe.

Q. Then you must have been looking through space, weren't you? A. Why certainly.

Q. So we must have had space from the place you shovelled out on top of this weir box down to the top of the pipe? A. No, the only space describes what we made ourselves.

Q. You told me what you took out and you certainly did not describe anything three by three at the top of that weir box? A. Yes.

Q. So how in the world could you look in there three feet at least down to the top of the pipe? A. I did not go to the top of the pipe; we went along the top of the tunnel.

Q. And if we look at the plan Exhibit 28 it gives an idea of the excavation you had to do to get to the top of that tunnel? A. Yes.

Q. The black earth on Exhibit 28 in front of the manhole that is going to the right in the plan represents the tunnel which you put in? A. Yes.

Q. And you say that you went in above the weir box, that is right, in the manhole? A. Yes.

Q. And made a twelve to— A. Fifteen to eighteen inches. I got in with my head and part of my shoulders, I think, that hole.

Q. And from there you got a view of the top of the tunnel where there was above the pipe, where there was a space twelve by twelve by two? A. Yes.

Q. And you have shown his Lordship from whence you came in order to get that view? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.

Albert
Walter
Haddow
Cross-Ex-
amination
continued.

THE COURT: Where on this map would that space twelve by twelve by two be?

MR. WOODS: It is a small kind of map and I will put a big one in in re-examination which will show it.

THE WITNESS: I am marking it on the section in the upper left hand corner and I am showing it by the letter "C" on Exhibit 28.

At 4:25 Court adjourns till 10:00 a.m., Tuesday, January 23rd, 1934.

Tuesday, January 23rd, 1934, Court resumes at 10:00 a.m.

Q. MR. SMITH: Can you tell me from your records or can you find out for me just when and how long the trenching and tunnelling across 107th Street was open for the laying of the conduit? A. The electric conduit? 10

Q. Yes, the electric conduit. A. I am sorry I cannot tell you how long it was open but from information I have from the electric light department it was installed in July 1926 but I have not the length of time that the installation was open. By the way, I came across the notes, about the notes, you were asking me about yesterday and they are as follows: four cuts; seven by two by six; ten by two by six; eight and one-half by two by six; nine by two by six. And I am sorry I have no information as to just how long that trench was open. 20

Q. And have you any way of finding out? A. Well I will endeavor to find out from the electric light department.

MR. WOODS: Are these the cuts for the conduit? A. The cuts for the electric light conduit.

Q. MR. SMITH: I just want to mention a few things to clean up. You spoke of the smoke test and you said that smoke went in under a pressure of three ounces? A. Yes, that is the maximum at which it could leave the machine.

Q. There is no question that you do not know anything better for making plenty of smoke than oakum. It is an excellent smoke? A. Oh 30 yes, oakum makes a lot of pungent smoke.

Q. And you will agree with me that the gas in the conduit box in the vicinity of that hotel would be under very little pressure if any at that point? A. Yes, after it left the fracture. Yes, its pressure would be decreasing all the time until it would finally come to rest at atmospheric pressure.

Q. And you certainly fixed the pressure at well below half a pound? A. Oh there would be a positive pressure and it would be I suppose worked out in terms of the velocity of the gas that is, the very fact that the gas was in motion would indicate it would be very low. I think I 40 would put it at less than half a pound.

Q. There is no doubt it would be less than half a pound. That is what I said? A. Oh yes, I think so.

Q. Now in ventilation. Suppose you were driving air for ventilation purposes through a large pipe and you went to take an off-set from that in a smaller pipe to go to another room, or something of that sort. You of course just beyond the outlet you would reduce the size of the larger pipe according to the amount that you have taken off in the smaller pipe? A. Yes.

10 Q. The reason of that is of course that you can be driving air along the pipe and you can cut a hole in the side of it and very little air will come out of that pipe unless there has been a reduction beyond the hole. That is true, isn't it? Ventilating people have found that out, haven't they? A. Well take the question of house ventilation. There, of course, take a hot air furnace, it goes out on account of its own buoyancy.

Q. Its own buoyant power? A. Yes.

Q. But take air in a big building or a shop. We have a main pipe and we take a smaller pipe off that? A. Yes.

20 Q. And in order to get air to go down the smaller pipe we must decrease the area of our main pipe in accordance with the amount we have taken off there to get the air to travel through the other pipe? A. What is usually done in that regard is the capacity, the quantity of air that the pipe has to carry—that is, if you are discharging air from a twelve inch diameter pipe and you wish to have an off-take, you take off a six inch pipe, then you reduce the size of the pipe beyond that off-take, I would say not for the purpose you suggest but rather that you do not need that additional capacity any more. May I illustrate that again by a sprinkler system in large buildings? You see that illustrated very well. A large main goes into the first sprinkler and when the sprinkler is in operation a certain amount of water comes out of that

30 and in order to get to the next sprinkler there is a less capacity required and you will notice if you examine it that the sizes get progressively smaller till you get to the end. Another illustration is in a golf field. Q. But I was dealing with air. A. Dealing with air. Say a twelve inch pipe is carrying say at a certain velocity and a hole is punched in the side of it. My idea would be that air would come out of that, for the very reason that it takes resistance and consequently pressure to overcome the additional pipe friction beyond and if the resistance here is less than in the pipe beyond this I think the air would come out of the aperture.

40 Q. Have you had experience that will permit you to say that, because the view that has been given to me with respect to ventilation is that you cannot successfully take air from a main pipe without reducing the main pipe and the outlet in the same amount as the amount you have taken out—that that is the reason for the reduction? A. Well I would really put it the other way.

Q. I was wondering whether you had designed systems which would permit you to give an opinion on it? A. No, I have not designed them but I am basing it on the fundamental law of resistance.

Q. And then there is another thing, that is the size of that natural gas pipe that is only through the south wall in the basement, it would be two inches? A. Well I do not think it is more than two inches. I have not measured it, but as I recall it it would be in that neighborhood.

Q. Now you told me yesterday, at least I understood you to say that in your memory the gas company had not paid the City for the filling of their trenches. That was your memory? A. Well wherever we did backfilling I think you are charged, and paid for it. That is as I recall the arrangement. Preparation of sub-grade was done on a cost-plus basis and the concrete basis on a unit area and the surfacing on a unit area basis, so if we did any backfilling it is in my recollection that we charged you and you paid for it. 10

Q. My suggestion to you is this, that in this general clean-up work which you were doing that an arrangement was made with you that you should do such work including the filling of some trenches and that was not your recollection. A. No, sir. My recollection with regard to that is paving. Now I will admit that in connection with that work as we hear the evidence of Mr. McGaffin we must have done some backfilling where he said the tunnels were empty between the cuts. We evidently did that. 20

THE COURT: I suppose even if they were so it would not relieve the defendant company in respect to faulty construction?

MR. SMITH: No, my Lord. I am not suggesting that.

Q. I am showing you invoice for \$909.87 and a portion of that, you will observe, is filling 110th Street; 100th Street and 111th Street, eighty-four to ninety, filling trenches 112th Street and then excavating and filling 103rd Street? A. Yes.

Q. And I am going to show you another one, October 25, 1923, and November 26, 1923, for \$131.54. And this is your invoice? A. Yes. 30

Q. Filling gas trenches for Williams Brothers 94th, 95th Street, south of 118th Avenue, grading lanes, hauling cinders to 106th Avenue 95th and 96th Streets? A. Yes, that is right.

Q. And I am showing you another one dated 24th November, 1923, an invoice for \$173.36 and a portion is filling gas trenches 98 to 108th Streets, 79 to 86th Avenue, grading lane 101A Avenue. And the next, grading and filling holes and installing culvert. But there is that trench filling that you observe there? A. Yes, sir. The trench filling, the trenches would be—I notice in most of these cases they are on boulevards and they probably would have settled and they would be made up in order to make them safe for traffic. I think you are right that even under pavement as Mr. McGaffin said there were occasions where he actually, in order to complete the job, had to fill the tunnel. 40

Q. Now take a look at this one. November 24, 1923, filling gas trenches 98 to 108th Streets. That would include this from 107th Street?
A. That would be the south side.

Q. Here is one excavating and filling in 107th Street, but it does not say trenches? A. No, it just says 107th Street. But I will say to you that might very well include—

Q. The work McGaffin did? A. Yes.

Q. I am going to ask to have these invoices marked as an Exhibit.

MR. WOODS: Formally I object. I do not think it has any bearing
10 on the issues.

THE COURT: What bearing have they?

MR. SMITH: I am tendering them on this basis, my Lord, that the witness McGaffin said that he did certain work and he also told you at the time that this appeared to be something that he had found in a bad condition as if we might be generally doing work in that way, and to say that by the arrangement we have suggested we were paying to have this thing done and therefore were not guilty of negligent or poor work generally. Of course I can call him with respect to the exact spot.

THE COURT: Well I will admit them. Of course if the City did
20 faulty work then it might not assist you?

MR. SMITH: I agree with that but what I do think is relevant to something which Mr. Haddow has very generously and properly said that on the whole in the instalment of this system of which 107th Street was a part, the work was well done.

**Three invoices, October 25, November 24, November 26,
1923, marked Exhibit 40.**

Q. Now I want to talk to you again about the plan, very briefly, and then I have finished. I am speaking of the large plan Exhibit 28. There is, I think, since adjournment yesterday—you have come to the conclu-
30 sion that the time Dr. Cameron was there with you was on the first occasion and the hole that was opened at that time was the hole in the weir chamber? A. Yes, sir.

Q. And that is the occasion when you and he and Professor Morrison were together? A. No. We three were there on the first occasion.

Q. The hole which was opened was the hole in the weir chamber?
A. I was wrong yesterday when I marked "X" on Exhibit 39. With your permission I would like to correct and mark the correct hole at "Y". I will mark "Y" where the actual hole was. It was in the front face I made that mistake. Where the first inspection was made from the
40 weir chamber was not at point "X" on Exhibit 39 but at point "Y".

Q. Now you also approved as I understood you, the statement of Mr. Underwood that the backfilling of the trench between the two manholes was done entirely from manhole "B"? A. Yes, sir.

Q. And I wish to draw your attention to your own report of the 3rd of March 1932 and I do this to try to straighten out how this work was done—a report with which you have been dealing in your evidence?

A. Is that my long report?

Q. Yes, the long report. Turn to page three. You say this, the middle of the paragraph beginning in the winter, “the weir chamber excavation above the roof was carefully and completely backfilled by hand tamping with dry and unfrozen dirt and no tamping was required to be filled in and the backfilling from this point was done from the manhole itself.” You are wrong, or Underwood is wrong? A. I think 10
it was found later the backfilling was actually done with concrete.

Q. Well what you mean by that is simply to say that the top of this weir chamber, you laid a form and filled it with concrete and which became a roof? A. Yes.

Q. And when you took out these blocks or chips in the weir chamber and could see right out there was no concrete to go there. Speaking of the first inspection are you suggesting the concrete came down there?

A. No, the backfilling I am referring to now is the backfilling above the top of the weir chamber. The backfilling, that is the first inspection, that is the one at which Mr. Cameron, Mr. Morrison and myself were 20
there, I do not recall whether there was dry dirt or whether it was filled with concrete. My information is from the bricklayer that he laid the brick and laid concrete between the back of the brick and the excavation.

Q. If it was not tamped from there with dry and unfrozen dirt as you say in your report, then the only alternative is concrete. The only alternative is concrete? A. Yes, sir, I think those were the two alternatives.

Q. And you will observe on the top of Exhibit 39 and also on the other one a roof, an eight inch concrete slab? A. Yes. 30

THE COURT: You mean on the top of the weir chamber on Exhibit 39?

MR. SMITH: Yes.

Q. The way that was done after your walls were built and the pipe bricked in or cemented in from the manhole “A” you laid a wall across those walls and filled the form with concrete? A. Yes.

Q. Now you could not of course pack concrete above that form. Or do you mean to say that after the form had settled you opened your manhole higher up and pushed concrete on that roof? A. What you would do instead of having an eight inch roof an actual flat top, the concrete itself would be integral with the roof. 40

Q. All you mean is that you pushed concrete into a form? A. Yes.

Q. With a view that you would shove enough in to reach the roof of the excavation which had been done for the weir chamber? A. Yes.

Q. And there is no doubt whatever that if that was done and your first statement is wrong that is all the backfilling that was done from manhole "A"? A. Yes, I think so.

Q. Now you no doubt have your notes there from which your report was made. Tell me on whose information you made the statement about this backfilling being done by hand tamping with dry and unfrozen dirt? A. One of my assistants Mr. Mount who was resident engineer in charge of that construction.

10 Q. Will you look at the plan on the left hand side? I am calling your attention to the backfill under the pipe immediately east of the dresser coupling? A. The left hand side is west and the right hand side is east.

Q. It would be immediately east of the dressers? A. As you face the plan the right hand side is east and the left hand side is west.

Q. Now you will observe the backfill there instead of from five to six inches increasing perhaps to seven and one-half inches— A. We are dealing now with the west side.

Q. The left hand side of the plan and backfilled where this drop comes? A. Yes, sir.

20 Q. And I suppose there is no doubt in your mind although you did not investigate that there would be backfilling further to the left, in other words, further to the west? A. I believe there would.

Q. In other words, no contractor, because he has been using an open trench would have a six inch drop in his trench? A. No, I don't think he would.

Q. That is beyond belief altogether? A. Oh yes, I think that condition probably extended west.

30 Q. So that there is no question that this pipe from on either side of that dresser coupling has been resting on backfill and a very considerable amount of backfill? A. It looks that way, yes.

Q. And it is also apparent that in that area that pipe has not subsided to any particular extent? A. Well I am sorry I cannot say. I do not know what the original elevations of the pipe are. I have not that information at all.

Q. I want this very simple fact from you. You have said with respect to the pipe further east than the place we are talking about that you found evidence of backfill; you used that as a reason, as I understand you, for saying our pipe had subsided, because it was laid in backfill? A. Yes.

40 Q. And if that is so why has not our pipe subsided where you see the greatest amount of backfill? A. I do not know what the original elevation was, whether it has subsided or not. As a matter of fact I took some straight-edge measurements over the gas trench west of the manhole and there was evidence of subsidence. I found on the pavement surface itself as I remember it, a middle ordinant of an inch and also

under the pavement slab itself I noted a typical subsidence where the subgrade had come away from the pavement. Now I am looking here to see if I have not recorded it at that point.

Q. No, because if you look at your pavement line which is immediately above the line we are looking at here you see your pavements to be almost exactly under? A. As a matter of fact, there was on the west of the manhole a length of about eight or ten feet I think where the subgrade from the pavement had actually separated from the bottom of the base a matter of three or four inches.

Q. Which might be accounted for in two ways—one, subsidence of the ground and the other shrinkage of backfill that was put in? A. No, I would not think it would be shrinkage of ground. It looked to me and I made the note at the time, it looked to me like a typical case of trench subsidence. We find it regularly on our own work where sometimes the ground will go down and the pavement will arch, that is the pavement will actually—it shows no sign of subsidence. Now to illustrate how far that can go I found a cavity one day that a whole coal wagon had gone into.

Q. That is not uncommon, to have a separation between the concrete base of your pavement and the ground beneath? A. No, that is not uncommon. It is a typical illustration of subsidence.

Q. This plan shows what you found when you surveyed our pipe after the pipe was broken? A. Yes.

Q. And I am pointing out that where this plan shows most backfill—you will admit that must be continued into the lane? A. Yes.

Q. That our pipe there has not subsided where all this backfill is found? A. I think it has.

Q. Well that is a straight line there isn't it? A. Yes, almost a straight line.

Q. I am suggesting to you that the line between the Dresser coupling and that break is a straight line? A. Yes, it is so close we will call it that.

Q. And you don't suggest, do you, that having a fixed point at the Dresser coupling, that there has then been a curve in that point through poor backfill? A. No, I will agree with you and say that the subsidence has continued west of the Dresser coupling.

Q. In other words, have you any reason to support that reason by saying it has continued? A. Just except what I have explained, that I actually measured by a straight edge the surface of the pavement and found that it had settled over the gas trench. Now if I may make a reference to my notes again, I think I recorded it here some place.

Q. I think you did make a point somewhere it is west of your centre manhole? A. I am reading from my own memorandum of May 25, 1932, and I say this: "An inspection made also at the intersection of 107th Street and the lane south of Jasper. No evidence of settlement over the

"30-31 sewer trench between manholes 'A' and 'B' on our plan could be "detected by measuring with a straight edge but a settlement of one inch "could be measured, * * west of manhole 'A'." And then I go on to tell about the trench sheeting heaving up.

Q. Where was it west of manhole "A," at what point? Do you remember in the first place? A. Yes. I would put it at twenty or twenty-five feet west of the manhole. That would bring it a little better than a third of the way along.

10 Q. Did you find any difference in the quality of the backfill under our pipe, we will say at the point where you have the note "bottom of original trench below the twelve-inch gas main." You will see that note underneath. Did you find any difference in the quality of our backfill there and then here, which is in the square directly underneath the word "under?" A. No, sir, nothing to note.

Q. So that you find this situation—that when you made this survey you found at the point I have first mentioned about seven inches of backfill? A. Yes.

Q. You found at the point that I next mention not more than two inches? A. About that.

20 Q. You found those backfills of the same texture and quality. You did not notice any difference? A. No.

Q. So that in one place, this was after the vent you found six inches of pipe of the same type of quality? A. Yes.

Q. And in another place you find two inches? A. Yes.

Q. And it is reasonable to say there has been no more sinking of pipe on account of the backfill at the second place I mentioned than there is at the first place I mentioned? A. Oh I think so.

Q. Well that strikes me, as a layman, to be pretty sensible? A. Yes, I think that is sensible.

30 Q. So I think we may safely assume that if at the first point I mention our backfill has held our pipe up reasonably well so it also has held it up reasonably well at the second point we have been discussing? A. Yes, I would think so, that the bearing should be about the same.

RE-EXAMINATION BY MR. WOODS.

Q. There is a matter I wish to clear up. That is the suggestion of subsidence on account of construction of the manhole. Now as I heard you, you mentioned a cavity or hole that you found at point "Y" on Exhibit 39? A. Yes, sir.

40 Q. And as I heard your evidence your impression of that cavity was something like twelve inches one way, two inches another way and a foot another way? A. Yes, sir.

Q. Now I would like you to either draw on a piece of paper or give to the Court some representation of how high that is?

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.

Albert
Walter
Haddow
Cross-Ex-
amination
continued.

Re-Exam-
ination

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.

Albert
Walter
Haddow
Re-Exam-
ination
continued.

MR. SMITH: I think my friend, inadvertently of course, has not described what Mr. Haddow said about that opening and perhaps if I give you my recollection of it we will get it cleared up. He has given no evidence of any cavity from point "Y." He says the brick from the manhole above the weir chamber cleared out the dirt and at the top of the tunnel of the pipe he saw a cavity there. Now that is my recollection of what he said.

MR. WOODS: I may be wrong but I understood him to correct that this morning in answer to my friend, that what he was referring to was at the point "Y?" A. The "Y" was the correction of the point "X" which I stated yesterday in error. My memory was wrong with regard to it. I thought he had gone to the top. I said the upper right hand corner but I find now it was the front and I can recall that now. 10

Q. Well you spoke, as I gather from your recollection, you spoke of finding a cavity twelve by twelve by two, as your general description of it at the place where you went through? A. Yes.

Q. And am I right in saying that you this morning corrected that to point "Y?" A. Yes, that is correct.

Q. Now just give the Court a representation of how big that thing is. A. Well twelve by twelve by two is a definite— 20

Q. MR. SMITH: I hope you won't mind my intervening. We may as well understand each other. The correction as I understand it was as to where Mr. Haddow said he had observed that hole from and I understood him to say he had observed it from the breaking through of the manhole above the roof of the weir chamber?

THE WITNESS: In addition to the twelve by twelve by two which is spoken of I said that there was a cavity also above this second manhole which is between the old sheeting and the manhole. And that is a cavity which I say extended to the northeast catch basin door.

THE COURT: Has the correction you have made this morning as between "X" and "Y" altered your evidence with regard to the location of the cavity twelve by twelve by two which you spoke of yesterday? A. No, My Lord. I think that stands. 30

Q. THE COURT: The location of the cavity stands? A. Yes, sir. But in addition there is a cavity—

THE COURT: Mr. Woods will come to that later. Let us deal with one thing at a time. I understand you to say that the change you made in your evidence as to correcting "X" and making it "Y" as to the point of observation does not alter the location of the cavity of twelve by twelve by two which you spoke of yesterday? A. No, My Lord. 40

Q. MR. WOODS: And your observation of that cavity came—did it come from "Y" or "X?" A. It came from "Y."

Q. THE COURT: Yes, that is the change he made. And it was no more than that. That is what you understood, Mr. Smith, I believe?

MR. SMITH: Yes, that is right, My Lord.

MR. WOODS: Now give us a representation of what a cube twelve by twelve by two is—how big a space it would occupy? A. Exhibit 17 is eleven by nine by two, slightly under two, and that would represent as nearly as you can the size.

Q. Now, sir, let me come to this other cavity to which you have been referring. There are just two. I am going to identify this plan later. It is a bigger scale than the other. It can be marked now I believe.

Plan of lay-out on a larger scale than shown on Exhibit 28, marked Exhibit 41.

Q. Now you observe here a space which—there is a line “pocket here about six inches wide” that is right on the side of the manhole, the main manhole “A?” A. Yes.

Q. And it is between this sheeting that held up the ten-inch main and the manhole? A. Yes, sir.

Q. Now all that ground between the sheeting and the manhole is filled ground? A. Yes, it has been filled—no, it is not. There is a cavity between the sheeting and the manhole which extends to the catch basin.

20 Q. But the building of the manhole has displaced the earth there? A. Oh yes.

Q. And it is not original soil like it is outside the sheeting? A. No. It is the old excavation of the 1907 manhole construction.

Q. And this cavity as shown is inside the sheeting? A. Yes, sir.

Q. And is in the approximate position as shown on this exhibit? A. Yes. My own observation is that the cavity is larger than is shown on that.

Q. Well would you mark just how far you think the cavity went up the manhole? A. I have marked on this plan Exhibit 41 with a series of “X’s” what I observed, and opposite that I have written down in pencil “cavity observed by Haddow.”

Q. And you can give me roughly the dimensions of that cavity? A. That cavity would be about six inches wide, that is between the manhole face and the sheeting that has been referred to and it would extend I think four feet above the weir chamber and the width of it I don’t remember exactly but I would say a foot or fifteen inches.

Q. Now I will explain this to Your Lordship. That is “Y” and here is a place as big as Exhibit 17 down there. Here is a place as big as he has now described there and here is the sewer resting on that scantling upright and here is the twelve-inch sewer there. Now Mr. Haddow, between that twelve-inch gas main and the top of that weir chamber is how far, how many feet of ground is it? A. Seven feet.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

—
No 39.
Albert
Walter
Haddow
Re-Exam-
ination
continued.

Q. And of that ground you have told there is something like one or two feet that are frozen? A. Underneath the gas main, yes, sir.

Q. I cannot remember the exact amount. It is one or two or three feet—can you tell me now? A. As I remember, it was two and one-sixth feet.

Q. Now had the second cavity, the one opposite manhole "A" any influence whatever upon the ground below the twelve-inch gas main? A. None in my opinion because all the ground outside the sheeting was undisturbed ground. The sheeting itself was in sound condition and the area between the sheeting and the old manhole was disturbed ground in the 1907 construction and I think that up to the present at least until such time as the sheeting has decayed and gone away that that would have no effect on the outside ground. 10

Q. THE COURT: May I understand this sheeting. What is it? Where is it on the map and so on? A. In the 1907 manhole construction in putting down that construction the excavation was first made and the excavation area, what we call sheeted. That is, a two by six wooden plank lining was made around the whole excavation and the walings — frames, were put inside this sheeting to retain the ground while the manhole construction was completed along with the grade and that sheeting wall was not removed. 20

Q. You say you found a cavity between the manhole and the sheeting that you spoke about? A. Yes.

Q. And that did not extend the whole height up to the ten-inch gas main? A. No, sir.

Q. But only covered a portion of it? A. Yes, sir.

Q. MR. WOODS: And the sheeting would be surrounding, I have got Exhibit 39 in front of me, it is two by six that goes around that thing standing on end? A. Yes.

Q. And the ten-inch gas main rested on the top of the sheeting? A. Yes, sir. 30

Q. Just as it stood? A. Yes.

THE COURT: If that cavity was left when the manhole was constructed why was it left? A. I don't know, sir.

MR. WOODS: I don't suppose it would be left? A. That was done in 1907. And I have no information. That is twenty-six years ago.

Q. Well without being a sewer engineer it would occur to me that that being filled ground it is very possible that some of that filling slipped down and left that cavity? A. Oh yes, that is my explanation of that.

MR. SMITH: With all of which we agree. 40

MR. WOODS: Let us forget about that. Now take this Exhibit 17, the size of that book, a hole that big, at that point above the weir chamber,

just at the side of the weir chamber. At least seven feet of solid ground between the twelve-inch main and that point? A. Yes, sir.

Q. Between two and three feet of that solid ground frozen? A. Yes, sir.

MR. SMITH: I think you are extending that a little bit aren't you? Would a hole that big have any effect whatever on that twelve-inch gas main? A. In my opinion it did not because the tunnel just above it was so far as we could observe absolutely undisturbed. The ground was in an undisturbed state; no fractures at all.

10 MR. WOODS: Tell me if I am wrong. I am just giving you my own ideas from other cases.

MR. SMITH: Mr. Woods, excuse me, give it to him correctly.

THE WITNESS: May I check that?

MR. WOODS: How much of a frost is below that? A. Two and one-sixth feet is the figure I thought I gave.

Q. Well we will compromise on two feet of a frost in the ground. Now the fact that there was a cavity there, would that indicate that the ground above the cavity had an arch? A. Yes, sir, that is why the cavity is there.

20 Q. And it makes a roof? A. Yes, it makes a roof.

MR. SMITH: I think the witness should be allowed and should be able to give his evidence without Mr. Woods assisting him.

THE COURT: You are suggesting that perhaps Mr. Woods may be doing what he has a right to do in cross-examination?

MR. WOODS: I do not suppose anybody suggests I would suggest some engineering thing to Mr. Haddow and if it was wrong he would not tell me that it was wrong.

THE COURT: I quite agree with that.

30 MR. WOODS: I will admit the question was leading but I was trying to shorten it up.

THE COURT: Oh do not try to shorten things.

MR. WOODS: What would you say as to what you observed when you looked at the top of that cavity, call it a roof or call it what you please, as to whether there was any sign whatever of a settlement of that brown clay above it? A. There was not the slightest sign in the tunnel roof of any disturbance, not the slightest.

THE COURT: What do you mean by the tunnel roof? A. The earth above the excavation.

Q. MR. WOODS: Transfer a cavity as big as that book Exhibit 17 so that it is not seven feet below but that it is right below the twelve inch gas main without there being any ground. Take that as a supposititious case. Take a hole as big as that on that twelve inch gas main and there is a hole right below it—what would happen? A. Well I think the structure the size of a twelve inch main would carry across that.

Q. Would carry across, you think? A. Yes, sir.

Q. Am I right in saying that your engineering term is that it would bridge it? A. Yes, sir.

10

MR. SMITH: To all of which we agree.

MR. WOODS: Now take Exhibit 28 and be good enough to mark for me on the original exhibit the extent on the twelve inch main that conceivably might be or possibly might be or in any way could be affected by that cavity. How big is it as compared with the whole length of the main? Just mark it on there? A. There is a five feet nine inches of the length of the twelve inch main which is over the weir chamber or the fifteen inch tile overflow.

Q. Now looking down in here, Exhibit 30, here is the twelve inch main and you say there is how much of the weir chamber and tile and sewer that is under that? A. Five feet nine inches of the main is directly over the extreme part of the twelve inch on the east side and on the extreme portion of the weir chamber on the west side. Now assuming that that construction affected the twelve inch pipe it could do it in two ways. One would be assuming that the backfilling settled and it came up as an arch. In all probability the actual subsidence, if it came up as an arch, would be less than five feet nine inches because that is the way in our experience arches break out. They simply break out and then a little piece in the centre drops down. If it came up as a grade subsidence it would be greater—five feet nine—that is there would be a certain outward slope. It would have to be a fairly steep slope because it would be necessary for a greater volume, the increased volume due to the outer slope could not get into the size of the subsidence hole.

20

30

Q. We know, and we are talking of a hole as big as Exhibit 17. We do not need to speculate on the subsidence because that is the only hole we are speaking of. I want you, if you will, to show visually on this plan the possible amount of that twelve inch main that might conceivably be affected by the hole as big as 17? A. I think it would be so small, I do not see how you could even indicate it. I think by the time that a cavity two by twelve by twelve inches reached the top, I believe it is no backfill would support the surface.

40

Q. Now taking your plan again that you have been looking at. And will you show to the Court the pipe in question, that is to say the twelve inch main going across the street and the gradual way in which

it gets down in the centre and then up again—over the whole 80 feet?
 A. Yes, sir. Beginning at the west property line of 107th Street and proceeding east at five foot intervals. The bottom of the twelve inch intermediate pipeline would have the following elevations.

10 Q. I meant you just to show, to see whether that subsidence of that pipe shows from one side of the street to the other, getting wider or more subsidence as you get to the centre of the street and then getting a less subsidence as you go to the other side? A. The elevation at the bottom of the twelve inch pipe at the centre of the street is just under six inches lower than it is at the west property line.

Q. And the sloping to that low part is gradual from each side of the street? A. Yes, sir.

Q. In answer to my friend you mentioned this break in the weld as I have your language "a comparatively new one?" A. Yes, sir.

Q. That is the impression which you got? A. Yes, sir.

20 Q. Could you at all go any further than that and tell us your impression of the thing, how new it was? When you say comparatively new— A. Well I would say it is a matter of possibly minutes. We are referring now to the time of the break in relation to the fire in the hotel?

Q. No, sir. That is just what I am not referring to. Have you any information at all in your possession to indicate or in your observation to indicate or give you any idea as to whether that break happened within twenty-four hours, ten hours, forty-eight hours, or one hour, or any time? A. No, sir, except as I said before that in my opinion it was a very short while before.

30 Q. Now since you were in the box before, I have found this figure I was looking for in the report and that is the amount of the gas on the test was shown to be coming up out of that hole, and I want you to correct your estimate of the time, of the five minute period by reference to the actual figures, this test was made by the engineers of the gas company. You have told us the leak was made in a short time. A. I saw the apparatus there being set up.

Q. And I am asking you to assume for the purpose of this question and for the purpose of correcting, if it makes any difference in your estimate that what I am now saying is correct, that that measurement showed there was one hundred and fifty cubic feet per minute going out of that aperture? A. No, sir, that would not revise my figures.

40 Q. Now this may be a question I should have asked in chief, although it arises out of cross-examination, but before answering it see whether it is objected to. In connection with that welded joint in the centre of the street could a dresser coupling have been put in at that point?

MR. SMITH: No, I am not going to object.

THE WITNESS: Yes.

Q. MR. WOODS: Would it have been advisable to put it in? A. As circumstances have turned out it would, because it seemed to be advisable after the break.

Q. MR. SMITH: After the break a split dresser, which is the only repair known? A. Yes.

Q. It was a split dresser? A. Yes.

Q. And there is no dresser there now? A. No, sir.

THE COURT: I did get a wrong impression from the answer which was not asked for. I understand now. 10

Q. MR. WOODS: What would have been the result if a dresser coupling had been put in there instead of a welded pipe being rigid at that point? A. The dresser coupling would have taken the movement of the pipe.

Q. Now my friend has brought out the fact and examined you on this. I cannot remember his series of questions. He put it this way—suppose that tunnel is found too deep in one place? A. Yes, sir.

Q. That is, when the grades are taken it is found it is off-grade in one place and the grade is below? A. Yes.

Q. Now suppose that not merely in one place but in several places that was found to be the case—the bottom of the trench is out of line—it is not to grade. Would that circumstance make it more advisable to put in a dresser coupling in the centre? A. Yes, where there is a possibility of movement—I would say yes. 20

Q. Mr. Gibb was assistant at the time he was in the gas company's employ. He was loaned by the City to the gas company? A. Yes, sir.

Q. And he was paid by the gas company? A. Yes, sir.

Q. He was pro tanto a gas company employee during that time? A. Yes.

Q. Now you spoke in answer to my friend and the possibility or suggestion I understood you to make was that possibly that piece of wood was used in the original construction as a sort of a roller to roll the main on into the trench? A. That is the thought that occurred to me. 30

Q. Now suppose that trench, and there is the piece of wood and the big pipe that has been pulled through the trench after coming out of the end of the trench. Now in proper construction what should happen to that piece of wood? A. Well it seems to me if it was used to skid the pipe in on after its usefulness was done it should be taken out.

Q. Once a roller is used like that to roll the pipe, then that purpose is finished and the roller should be taken away? A. I would think so. 40

Q. And the pipe let down to the bottom of the trench?

THE COURT: The witness did not answer the last.

Q. MR. WOODS: What would happen to the pipe after the rollers were taken away? A. It would take its bearing on the bottom of the trench.

Q. THE COURT: Is the suggestion that this piece of wood, Exhibit 26, had the pipe resting on it and the pipe in suspension above the bottom of the trench? Is that the opinion you are giving as to the kind of construction this company used? A. No, sir. My suggestion is this, that both under the twelve inch and the ten inch there were pieces of wood and in the case of the twelve a brick, all shown on our plan as
10 Exhibit 28 and my thought is that on the basis of the method that has been described in evidence that the pipe was welded in a string on one end of the pavement intersection and was then pulled through in one length across the intersection and then connected up with the dresser coupling and it was my opinion that the sticks of wood—

Q. MR. SMITH: There is only one stick? A. Yes, the stick of wood and the brick would facilitate that operation.

MR. WOODS: May I say to your Lordship something in connection with your question to the witness?

THE COURT: Certainly.

20 MR. WOODS: The evidence, as I understand it—I may be wrong, but if so let us clear it up—the evidence, as I understand it, was that the pipe was in suspension between that piece of stick and the brick on the other side for the distance of something like thirty-eight feet and with the end falling at that point—that whatever amount of ground was put in could not be adequately put in, Mr. Ruff said that, because of the length of the trench. It was really in suspension. This is a note my friend (Mr. Friedman) took of Mr. Ruff. He said: “Two or more pieces of wood, maybe more, upon which the pipe was resting, not on a solid foundation, not strong enough to support the pipe.”

30 MR. SMITH: He also said one-half on virgin soil and one-half on backfilling. That is the pipe we are talking about?

THE COURT: Yes.

MR. WOODS: Backfilled under half of it, according to Mr. Ruff. I do not mean to say there was no earth below in some places, but it was resting, not supported by the earth, but supported by the—

40 THE COURT: If that were so then what time would you expect this welding to have given away, being laid in 1923. I am asking that to test your opinion? A. As stated in my previous evidence, I said to Mr. Smith that the action which I think took place is a progressive one and to answer your question direct—it would give way when the stresses developed in the weld exceeded the resistance of the weld.

Q. And in your opinion, or can you give such an opinion, do you think eight years would be a long time? A. No, sir. I cannot give the

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No 39.
Albert
Walter
Haddow
Re-Exam-
ination
continued

exact opinion as to date. I would leave it—it is quite obviously from an engineering point of view, that is when the stresses in the weld exceeded the resistance of the weld then the weld would give way. In Mr. Smith's cross-examination of me he said ninety-nine per cent. of the welds give way the first year. Well now, that might happen at any time when it is put under stress.

RE-CROSS-EXAMINATION BY MR. SMITH

MR. SMITH: I do want to cross-examine on this new matter. My friend said he was bringing in some new matter which he should have brought in in chief. 10

THE COURT: Whether it is the proper time or proper method you may cross-examine on any part of it. I think we have been for the last day or so at what perhaps may become the real point in the whole case. I do not know.

MR. SMITH: There are only two matters I wish to mention.

THE COURT: Even large matters may get down to small things. Mr. Woods suggests a book and you suggest something else. Or rather Mr. Woods suggests the brick and the piece of wood and you suggest perhaps the small book. I don't know.

Q. MR. SMITH: The fact that you saw a cavity two by twelve by 20 twelve meant that there had not been subsidence at that point or the cavity would not be there. The cavity is there before the subsidence takes place. A. What happens is when a cavity is present under those conditions the cavity is formed by the subsidence first of all of the back-filling material and then following it through to a limit the undisturbed material above it will begin to fill that cavity.

Q. The fact that you saw the point— A. I don't know whether it has been stated, it has not been emphasized lately anyway that that cavity was there on a vertical plane, as I recall it. The cavity would be as if you stood the book Exhibit 17 on edge. I don't know whether that 30 was mentioned. I forgot to say that.

Q. Now I want to ask you about a dresser coupling. There is no doubt dresser couplings do take up expansion and contraction. That is what they are primarily for? A. Yes, sir.

Q. There is no doubt they do go wrong? A. Yes.

Q. They are things which give trouble? A. Yes.

Q. And I am sure you will regard it as good engineering that if you could have a solid joint which would render proper service it would be better having that under a pavement than a dresser coupling, providing it would give the service? A. Yes, from the point of view of gas 40 tightness I think a welded joint, a good welded joint, is undoubtedly more reliable than a dresser joint, just from that one point of view.

Q. For example we know they built a line a thousand miles long

from Amarillo in Texas to Chicago, a thousand miles long, a solid welded line? A. Yes. Of course they made provision for expansion and contraction.

Q. And you make provision for expansion and contraction in bridges here? A. Yes.

Q. So now we will leave the dresser joint. And you said a moment ago as I understood you and it was news to me, Mr. Woods said that his position in any event was, if not yours, was that we had a pipe with a thirty-eight foot beam standing there in suspension between a brick bat and a little stick of wood. You heard him say that? A. Yes.

Q. I want you to tell me whether you figured it out or not taking that twelve inch gas main and suspending it a thirty-eight foot length and two solid ends—if you figured out the drop there would be in that pipe? A. Not for thirty-eight feet. I took it for eighty feet as a uniform beam.

Q. I mean the pipe itself? A. Yes, sir. I took a deflection distance of six inches, and I took it that gas pipe had been raised six and one-half inches.

Q. We are not talking about the same thing. I was wondering if you had made the calculation. It is something easily calculated? A. Yes.

Q. And I am suggesting to you on this theory that we left something bending, that the bending in that pipe would be only four-tenths or six-tenths of an inch in thirty-eight feet, that figure would not surprise you? A. I calculated it for eighty feet.

Q. Did you make a calculation? Did you do it by way of calculation? A. Yes, I did.

Q. And what did you get? A. I calculated with a uniform loading.

Q. You mean calculate with a uniform loading—there is no other way? A. No, that has to be accepted. I calculated a uniform loading of forty-eight pounds per lineal foot of pipe for a distance of eighty feet and got a stress of 10,473 pounds per square inch in the extreme fibre. And I calculated also to find out what loading would give a deflection of six inches and I found that for a span of eighty feet that that loading would give a deflection.

Q. Of 10,000 pounds per square inch? A. Exactly 10,500 pounds per square inch.

Q. Are you a believer in the theory that metals tire? A. Yes.

Q. And are you going to say that putting that under a stress of 10,000 pounds per square inch will break? A. There is what is called the fatigue of metals, and a metal subjected to repeated stresses undoubtedly breaks.

Q. But when you suspend this pipe of ours between two points and leave it there under a load of 10,000 pounds per square inch and you have a weld in that pipe that will carry 30,000— A. That would remain indefinitely under those conditions.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 39.

Albert
Walter
Haddow
Re-Cross-
Examina-
tion.

continued.

Q. And if it were under suspension here as suggested by my friends and a very able engineer, Mr. Woods, if we have our pipe in suspension as he suggests then the fact that it will stay there forever or indefinitely— A. Yes, under that type of loading.

Q. Then we must turn to repeated shocks or something of that sort? A. Repeated shocks or over-stressing. The shocks could occur from traffic conditions. They would not be so severe under a paving as they would be on an unpaved road.

Q. We have a pavement here. A. Yes. To illustrate what they will do, we had a place on the top of McDougall hill before it was completed 10 where a row of vitrified pipe was broken repeatedly due to shocks and then there was the stressing by frost action.

Q. Now this line here (Exhibit 30). Is that open trenching from the surface? A. I am not sure. That was done in 1907.

Q. There was no other way? A. Well I do not know whether it would be done under stall or open trenching.

Q. That is the way—either pit or stall or open trenching? A. Yes.

MR. WOODS: The suspension to which I referred and to which Mr. Smith referred between that block and that particular brick bat thirty-eight feet away, I am asking you, that would not remain sus- 20 pended all the time—it would sink both the block and the brick into the trench? A. Yes and as soon as the backfilling would be reached that would relieve it of a complete suspension. The situation you outlined, is when the pipe was pulled into the trench and in all probability it rested clear of the bottom of the trench and as soon as the backfilling was taken on would relieve that as a beam in suspension.

MR. SMITH: I take it you took the eighty foot length for your beam because you did not believe in the beam of thirty-eight between the brick and the stick? A. Yes. I could not see any other reasonable way of analysis. There was a flexible joint at which all these dressers 30 and the backfilling underneath the pipe would undoubtedly give the pipe some support between the short pieces. And the only analysis that seemed to me reasonable to make was to assume a uniform loading of that beam and that loading would be the difference between the resistance of the backfill and the super-imposed loading from the surface and that super-imposed load from the surface, for the purpose of my analysis, I thought the only live load that would be imposed would be that from jacking action without expansion, and that would be clear across the whole eighty feet but on account of the sag in the pipe, that is the sag in the profile of the pipe, the ends at the dresser coupling 40 would become fixed first in frost casing while the action was still going on at the centre of the street.

MR. WOODS: My friend is going to produce two invoices and subject to anything arising out of them I am finished with Mr. Haddow, and if not he can be recalled.

Evidence of William Barnhouse.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 40

William
Barnhouse
Examina-
tion.

WILLIAM BARNHOUSE, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. You are the superintendent of the Electric Light Department in the City of Edmonton? A. Yes, sir.

Q. And you have been an employee of the City of Edmonton for how many years? A. Thirty-two.

10 Q. You are a brother of the City Treasurer, Mr. Frank Barnhouse?
A. Yes, sir.

Q. There are two matters I wish to take up with you and the first is as to the construction of the conduit box that we have heard of in evidence and which is shown on this model Exhibit 30. You had something to do with it when that box was put in in 1926. You had something to do with the construction of that conduit box? A. Yes, I had.

Q. What did you have to do with it? A. Our general foreman and one of my gangs installed the conduit.

Q. And that was in 1926? A. Yes.

20 Q. And do you remember that construction in the lane behind the Corona Hotel? A. Well not any more definitely than I do the rest of it.

Q. Have you any memory that would assist us in coming to a conclusion of the distance that box was away from the south wall? A. Yes. We went to the engineering department to get a location through wherever this system went and coming west on the lane south of Jasper we found that the gas company had to swing their mains north to miss some obstruction, I think it was a telephone manhole, and there was no room between the gas mains and the pole line for us to get through. Therefore we swung to the north side of the poles, the pole line being
30 approximately four feet from the north property line of the lane.

Q. Now I am trying to get you on this plan Exhibit 4 to identify that place where you swung north? A. I could not do that.

Q. Well let us see how close we come to it. This is the lane south of Jasper Avenue and that is the basement walls of the hotel, of the Corona Hotel. This is the west wall and that is not excavated and then there is a brick wall there and then right next door to the brick wall there is basement steps. You see a back door coming out on to the lane from the basement. Now do you remember at the time of that construction, that back door, and whether there were any steps down from
40 it at that time? A. Yes, I remember that.

Q. And there were steps down from it on to the lane? A. As far as I can remember there were two steps in the lane, that is outside of the foundation and the conduit line either passed under that step or

just immediately to the south of it. I remember at the time they called me there in respect to where they would go and I am of the opinion it was right under the first step. I think they had to remove the step to put it in.

Q. And how far was that from the south wall? How far would the north side of that conduit box be from the south wall of the building? A. About two feet six inches.

Q. At that point? A. At that point.

Q. And I gather that is the place you made the bend to get over? A. Well I would not say we swung there. But that is the only place I could definitely say where it was located. 10

Q. What was the purpose of the box? A. Oh it was just a warning so that workmen coming along there at any future period if they got into the wood they would know there was something inside and probably take a little more care than if there was nothing there at all.

Q. Now you went to that fire on the night of the 21st of February, 1932? A. Yes.

Q. What time did you go? A. Well I can hardly say the exact time. I understand the fire started about nine o'clock. If that was so I was there about nine-thirty. 20

Q. And what did you do? A. For a minute or two took in the general situation to see whether I thought it was going to be a big fire or just a small one.

Q. And where did you park your car? A. On 6th Street north of Jasper Avenue, close to the lane.

Q. And where did you go? A. I first went across to the lane south of Jasper on 106th Street to examine the fire from the back. And then I decided that it was time I got some men on the job and I went to a phone and phoned and got one of my gangs out.

Q. That is to protect the City? A. To protect the wiring, to protect the City, and I stayed around that corner until the men appeared and I started them to work to fix up the wire so we could get the wire running past the hotel in case it was necessary. 30

Q. And then where did you go? A. I went back over to the car and one of my boys—I do not know whether this has much to do with the case—one of the boys wanted the car to move some of the people from the hotel and the car went away and I thought I had better take a look around on the other side and I went west on the lane north of Jasper to 107th Street and then south to the lane south of Jasper.

Q. Across Jasper Avenue? A. Yes, and went south. I was fairly well on the west side of 107th Street and as I came to near the intersection of the lane I saw a man and a couple of boys standing near the manhole in the centre of the street. I would presume it would be this manhole here (indicating manhole "A" on Exhibit 30). They seemed to be laughing and joking and I wondered what was exciting their curiosity, so I went over to the sidewalk on the east side of 7th Street and turned 40

around there for a minute to watch what was going on and a few minutes afterwards the manhole cover blew off.

Q. How high did it go up in the air? A. It went up high enough to hit the telephone cable which was approximately twenty feet in the air and lit on the pavement again.

Q. Did the manhole cover have snow and ice over it or do you know whether it had or not at the time you walked down? A. Well there was not very much snow just around the manhole at the time. I would not say whether there was any on the cover or not.

10 Q. And when this occurrence happened what did you do? A. I walked out to the manhole to have a look to see what was the cause of the trouble and looking down inside there was a glow around the edge of the manhole. Looking down in you could see a glow all around inside of the manhole around close to the edge but not in the centre.

Q. Not in the centre? A. Well it was not full of flame.

Q. Oh I see. It was not in the hole. A. No. But there was a slight flame all around the edge.

Q. What sort of a flame? A. A bluish flame.

20 Q. And then what did you do? A. I turned around and went back and went up the lane east to back of the Corona Hotel.

Q. That is the lane south of Jasper? A. The lane south of Jasper.

Q. Could you get right through that lane at that time? A. No, I could not get through on account of smoke and firemen, and I was scared of getting wet so I climbed over the fence into the light facing on 107th Street and went around into 106½ lane, climbed over another fence and to a little stable on the other side and came back out on to the lane again.

30 Q. Had any of the walls around the south of the building or the east wall of the building to the south fallen in by this time according to your memory? A. There was an explosion when I was over on 6th Street before I made this trip around and there was a portion of the centre of the wall—I have not got the plan here—

Q. This is Exhibit 4? A. There was a slight explosion up here that took out a piece of the wall. That is all that I know of that was out at that time.

Q. This south part was not affected at that time? A. No, not at that time.

40 Q. Well then where did you go after that? A. I came back over the fences again and I got on the lane and went back towards 107th Street.

Q. And did you have any experience of any sounds while you were walking back that might be of significance? A. Well I felt two or three shocks on my feet as though there was an explosion underneath.

Q. Where were you then? A. Well I would be between the southwest corner of the Corona Hotel and the corner of 107th Street.

Q. Along in the lane? A. Along in the lane, yes.

Q. That is what you describe as some shocks or explosions? A. They were explosions underground, yes.

Q. Under your feet? A. Under my feet, yes.

Q. What did they sound like? Can you give us an idea of their sound? A. It was just a rumble and you would feel the jar of the pavement.

Q. And did you have any experience of any other manhole? A. Yes. I came out of the lane at the corner of 107th Street and the manhole cover blew again. That time it went quite a lot higher. It went as high as the wires, the wire at that location would be about thirty-five feet. 10

Q. Someone had put the manhole cover on again? A. Yes, it had been put on and that time it hit on the pavement to the west of the location of the manhole and rolled into the lane.

No cross-examination.

No. 41.

**Further extracts from the Examination for Discovery of Julian Garrett,
Manager of the Defendant.**

MR. WOODS: I have come to the place where I intended to call an expert witness which I have arranged to come from the Technical School in Edmonton. I intended to put in a few questions from the examination of Mr. Garrett (Reading): 20

"9. Q. And I observe that there is an Agreement which your company refers to in its Pleadings, and which is known as the Franchise of the Company? A. Yes.

"10. Q. Referred to as being validated by the Legislature of Alberta. Have you got that agreement, by any chance?

MR. MILNER: It is a schedule to the Act.

MR. WOODS: Have you got the original of it?

MR. MILNER: No. I don't know where the original is.

"11. Q. MR. WOODS: That Act is the Act in Chapter 29 of the Statutes of 1916? A. Nineteen-sixteen. 30

"12. Q. And the Agreement, which Mr. Milner quite properly says is a schedule to the Act, was executed by the City and the Company on the 16th November, 1915, according to the Agreement? A. That is correct.

"13. Q. And the Agreement is an agreement between the City of Edmonton and the Northern Alberta Natural Gas Development Company Limited? A. Yes.

"14. Q. Now can you tell me how that Agreement came to be the Agreement or franchise of Northwestern Utilities, Limited? 40

MR. MILNER: It was assigned, some time in 1923.

"15. Q. Assigned by whom? A. Assigned by the Northern Alberta Natural Gas Development Company to the Northwestern Utilities, with the approval of the Board of Public Utilities.

"16. Q. Now perhaps you or Mr. Milner can tell me whether there was anything, between the passing of the Act in 1916 and the execution of the Agreement in 1915, and the time when that agreement was assigned as he states, that kept the Agreement alive?

MR. MILNER: Subject to the objection that it is not material. There was a long series of negotiations between the City and the Company, 10 which were finally settled and adjusted by an Agreement.

"17. Q. That is, between the City and the Northern Alberta Company? A. Yes.

"18. Q. Which were finally settled and adjusted; by the transfer of this Agreement, was it?

MR. MILNER: No. Again subject to the objection. In the fall of 1921, or the spring of 1922, a settlement of all matters in dispute between the City and the Company—

MR. WOODS: That is, this Company mentioned in the Statute?

MR. MILNER: Yes, the Northern Alberta Natural Gas—were re- 20 duced to an agreement and settlement and, pursuant to the settlement, the Board of Public Utilities Commissioners, in 1922, fixed the rates. And then, in 1923, the Northwestern Utilities was incorporated, and, with the approval of the City and the Board of Public Utilities Commissioners, the franchise was assigned by the Northern Alberta to Northwestern Utilities.

"19. Q. MR. WOODS: What I am referring to is that portion of the Agreement that I find in the Statute that calls for the completion of the pipe line and distribution system within two years from the final execution of the Agreement by the City, or, at the outside, two years 30 and six months. Can you give me any information as to how that was kept alive? A. There was a penalty imposed, that you will find in the franchise there somewhere, and that penalty was paid.

"20. Q. That is the penalty of one hundred dollars a day payable to the City as liquidated damages? A. There was a penalty paid. That agreement is in existence somewhere; whether this Company has it I don't know, but the City certainly has it, and the Board of Public Utilities Commissioners has it.

"21. Q. What I want to do is to trace out the facts, to establish whether this Agreement was extended in any way, or whether it came 40 to an end? A. Oh yes, it was extended. In the Statutes of 1921 or 1922 there is another Act.

"22. Q. Perhaps I can leave that just now and you may look it up. There must be some authority in the Company's hands. A. They are all in the hands of the Public Utilities Commissioners.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 41

Further
Extracts
from the
Examina-
tion for
Discovery
of Julian
Garrett,
Manager
of the
Defendant
continued.

"23. Q. Has the Company got anything of that kind?

MR. MILNER: I wouldn't think so. Apparently the City waived that option and there was an Act passed, I think it was in 1920 or 1921. My recollection, which will have to be confirmed, is that we paid twenty-five thousand dollars—twenty-five or fifty; it may have been fifty—being the penalty arrived at; and the Agreement was re-instated.

"24. Q. By some form of legislation? A. By both legislation and agreement. The only other legislation on the subject is contained in Section 19, of Chapter 4 of the Statutes of Alberta, 1922. 10

"25. Q. Apart from that statutory thing, you have memory that there were negotiations between the City and the old Company, and that Agreement will be either in the possession of the City or the Board of Public Utilities? A. I think it is probably on record, too, in the Court, in an action brought by the City against Northern Alberta Natural Gas Development Company, Limited.

"26. Q. What I am interested in is whether the franchise was extended? A. The City never exercised that option."

MR. WOODS: It is admitted for the purpose of this action to be a fact that the Northern Alberta Natural Gas Development Company Limited was a Provincial company and subject to the existing Provincial legislation. 20

MR. WOODS: I am now reading Mr. Garrett's examination, questions 789 to 793 inclusive:

"789. Q. Could you give me anything closer than that, other than they thought it was a fairly recent break? Do you mean fifteen minutes, half an hour, an hour, or what? A. Within the twenty-four hours preceding the discovery of the break.

"790. Q. And the break was discovered at what time, exactly; do you remember? A. I think I have already given that. 30

"791. Q. No. I asked you to get me, as nearly as you could, the exact time when those holes were put down, and you were to look it up, and tell me later on. Will you give me, for those purposes, just as near to the hour as you can when your men, in digging that No. 4 hole through the pavement, came on that break? A. My impression was that it was somewhere from one to two o'clock on the afternoon of the 22nd.

"792. Q. So the nearest indication you can get, from any information that you got, or that your Company got, was that that gas had not been escaping through that break prior to the similar hour on the 21st? A. Yes. 40

"793. Q. Could you come any closer than that? A. I don't know; I wouldn't think so."

MR. WOODS: And there was something in Mr. Garrett's examina-

tion about the direction or velocity of the wind which I have not yet got and perhaps Mr. Martland will have it after adjournment and if it corresponds with our information we can read it into the examination.

At 12:20 Court adjourns till 2:15 p.m.

At 2:15 p.m. Court resumes.

MR. WOODS: I have one other question from the examination for discovery of Mr. Garrett. It is No. 679:

"679. Q. MR. WOODS: The snowfall, and the velocity of the wind, and the direction of the wind? A. I will get that."

10 MR. WOODS: I am now furnished by Mr. Garrett with the answer to that (Reading): "On February 21st, 1932, at 3:00 p.m. the velocity of the wind was nine miles per hour; the direction of the wind was southeast."

No. 42.

Evidence of James Kidd.

JAMES KIDD, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. What is your occupation? A. Teacher.

20 Q. Teacher of what? A. Forging and metallurgy, at the present time at the Technical School in Edmonton.

Q. Have you had any experience as a welder? A. Yes.

Q. What experience? A. I have had eighteen months constant welding pipes in Scotland and I have been conducting a number of welding classes as a teacher in Edmonton.

Q. Did you start in as a welder? A. No. I started my apprenticeship first as a journeyman blacksmith and welding after.

Q. Where was that? A. At Lanarkshire, Scotland, twenty miles west of Glasgow.

30 Q. And how long have you been teaching? A. Three years in Edmonton at the Technical School.

Q. And this matter of the welding of pipes is one of the subjects that you cover? A. Yes.

Q. Do you consider yourself competent to tell a bad weld from a good weld? A. I do.

Q. I am producing to you two pieces of pipe which are put side by side for the time being? A. Yes.

Q. It is a piece of gas pipe? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 41
Further
Extracts
from the
Examina-
tion for
Discovery
of Julian
Garrett,
Manager
of the
Defendant
continued.

No. 42
James Kidd
Examina-
tion.

Q. And the other part or open part of that weld that is in that pipe is here (indicating)? A. Yes.

Q. That is as if that went on there? A. Yes.

Q. It was desired to have this to cut a piece out of it but my friend wanted your Lordship to see it before having it released for that purpose and it will now be released.

THE COURT: You mean it is an exhibit and then there will be some interference with it?

MR. SMITH: Yes. I see no objection.

THE COURT: Well, by consent, it is admissible. 10

MR. SMITH: I wanted your Lordship to see it before it was cut.

Two sections of welded pipe (broken weld), marked Exhibit 42.

Section of pipe with piece cut out, (at broken weld), marked Exhibit 43.

THE COURT: By consent, Exhibit 43 is to be allowed out and the plaintiffs may have the piece cut out of it by consent of the defendant.

MR. SMITH: As I understand the situation, shortly, it is this; my friends want this piece out and these two expert gentlemen are going to examine it together. Is that right?

MR. WOODS: Yes—Mr. Cameron. It is done by both, the pieces being cut out, not especially by us but by or under the direction of one 20 of our experts and one of the experts of the defendant.

THE COURT: As long as it is a matter of agreement between you I see no objection to it.

MR. WOODS: Now before we go on, will you describe to the Court what the operation of acetylene welding involves; what it is; how you go about it? You can illustrate your remarks if you please by reference to the exhibit in your hand. First of all, tell the Court how you go about welding two pieces of pipe? A. The first thing you ask was what acetylene welding does. It is known as autogenous welding. From that it means we fuse the two surfaces together in the liquid condition. In performing the weld, the first thing to do is to see that you have a proper regulated flame to arrive at the proper fusion. In the case of welding these two pipes, they are put together to approximately one-eighth of an inch apart. 30

Q. You are describing how the weld ought to be done? A. Yes, sure. The flame is then directed and the two sides are fused together in a liquid condition to run together. After you have them in the molten condition—you must have them in the molten condition from the bottom of your weld.

Q. What do you mean by bottom of the weld? A. The inside of the weld. That pipe should be like that while it is being welded (illustrating).

MR. SMITH: I am very anxious he should not continue to grip the surfaces together.

THE COURT: I think perhaps my insistence upon what is to be done with an exhibit—that it should be done by consent or arrangement, will be understood—when I agree with the last remark that the interference of exhibits may be a matter of concern and you will try not to interfere with the surfaces.

10 MR. WOODS: Do not alter the two surfaces.

THE COURT: Perhaps I can understand if you do not put them together.

THE WITNESS: The flame is directed on there to fuse them together in a liquid condition, which must be in the bottom. If the weld is proper you will find all the way around a serrated edge showing it has been molten and has run through, thereby making a perfect union.

20 Q. What do you use to get the metal through the pipe? A. You use an oxy-acetylene blow pipe, that is a small blow pipe with a proper nozzle on it and two gases in there, oxygen and acetylene, which are regulated together in the mixing chamber and you get a flame on the nozzle. There are three flames. The first is a carbonizing flame, the second a neutral flame and the third an oxidizing flame. The proper flame is the neutral flame. If you adopt the carbonizing flame you will be putting more carbon into the material than is necessary. If you use a neutral flame, when the gases are equal in volume, the flame is neutral and trouble cannot arise from being oxidized or carbonized. If, on the other hand, you have an insufficient supply of acetylene you will get an oxidizing flame and you will find all kinds of ribble flakes in the weld.

30 Q. Now have you any other machine or implement? A. The only other thing you have is a welding rod. That is a small rod about three feet long, one-eighth of an inch in diameter or three-sixteenths of an inch in diameter, and if you are welding a steel pipe they are commonly made from a good variety of Swedish iron.

Q. That is a steel pipe? A. Yes.

Q. How do you use the welding rod? A. Well, after you get the bottom of the weld to a liquid state you keep this rod in, and in applying the flame you melt the rod at the same time and you keep them all together and thereby you are working up from the bottom of the pipe and making the whole thing a homogenous weld.

40 Q. I understood you to tell me that in this operation you started your welding right from the bottom of the pipe? A. Yes, you start from the bottom of the pipe here and weld up (indicating).

Q. Now the welded joint in that pipe—there has been a welded joint in it? A. Yes.

Q. And it has been shown to you? A. Yes.

Q. Is that a proper welded joint? A. It is not.

Q. In what respect? A. It has never been welded down completely through the bottom of that weld; never was perfect.

Q. Will you show to the Court evidences of that fact in the exhibit before you? A. Yes, the evidence lies here. Had this been perfectly welded it would have been all rough in the inside as well as on the outside, showing that it was liquid right down to the joint. 10

Q. Is there anything on this Exhibit 42—point out to the Court the place on Exhibit 42 which discloses the facts that you have given in evidence? A. Here is a plain line here extending for one-eighth of an inch back. That is the point of adhesion which was never in a liquid condition because the flame never got down to the pipe to make it liquid right down to the bottom. From there they started to build up the liquid material. This has never been in a liquid or molten condition.

Q. And do you find that same circumstance surrounding the pipe at that place? A. It is all the way round.

Q. I am showing you some photographs that have been taken of these. I am showing you a photograph of part of Exhibit 42. Do you recognize it as such? A. I do. The adhesion line is very evident in the photograph. It never was in a molten condition. You make an adhesion from that point upwards because the flame never got down to liquefy it in a molten condition on that point. 20

Q. And you are pointing on this photograph to a point just above the arrow? A. Yes.

Q. I am tendering a photograph.

THE COURT: Why photograph when you have got the actual thing? 30

MR. WOODS: Well, it illustrates the same thing.

THE COURT: Is there any objection to it?

MR. SMITH: No, my Lord.

Photograph of end view of section of broken weld, marked Exhibit 44.

Q. Now looking on the side of Exhibit 44 or at Exhibit 44 or both, can you find any gas cavities apparent? A. In this photograph here—well of course I understand this as an ordinary photograph. There has been no micrograph taken of it. It will be difficult to observe it with the eye more than with a micrograph.

MR. SMITH: My friend should tell us what this is a photograph of. 40

MR. WOODS: It is a photograph of a section of the broken weld.

THE COURT: A photograph of part of Exhibit 42?

MR. WOODS: Yes.

MR. SMITH: We did not know which it was.

MR. WOODS: Can you observe with the naked eye any gas cavity in that weld? A. Yes, there is one (indicating).

Q. You pointed to a place just at the tip of the black arrow, just above the black arrow? A. Yes.

Q. And another one to the left, quite close—several? A. Yes.

10 THE COURT: Is this a conversation that is desired to be taken down or not?

MR. WOODS: No, it is evidence desired to be taken down.

THE COURT: Neither the Court Reporter nor I can hear what the witness is saying and counsel has some duty.

MR. WOODS: Will you tell the Court—point out to the Court as you pointed out to me, in a voice so that the Court Reporter can take it, and describe the positions on the photograph in your own language where those cavities are? A. Yes.

20 Q. Well go around and do it. A. There is one gas cavity just a little to the left hand side of that arrow. A little further to the left there is one, two, three, right through. Still further left you have one, two, three, four, five small ones.

Q. Now I am showing you one photograph that I will identify later, of a weld at one end of this pipe, not the weld in question but the next weld to it on one side? A. Yes.

Q. And another weld, I am showing you a photograph of another weld on the other side of that weld that is marked 42? A. Yes.

Q. And I will identify these photographs later.

Micro-photograph of section of weld west of broken weld, marked Exhibit 45.

Micro-photograph of section of weld east of broken weld, marked Exhibit 46.

30 Q. Looking at Exhibit 45, in the first place will you state whether you see there, that is under microscope, any gas cavities in that photograph? A. Yes.

Q. Point them out in an audible voice so the Court Reporter can get them? A. There is a complete cavity right above this "V" in the bottom of the weld right there.

Q. And while you are there you spoke of a "V" in the bottom of the weld? A. Yes.

40 Q. How does that "V" occur in welding? A. The "V" is sometimes used to be sure that you get your flame to the bottom of the weld to have perfect fusion. That is the idea.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 42
James Kidd
Examina-
tion.
continued.

Q. Well then, can you tell from the appearance of the pipe itself or the photograph whether any portion of this pipe is bevelled?

MR. SMITH: My friend asked the question "can you tell by looking at the photograph or the pipe yourself."

MR. WOODS: It is the other end of the pipe. It is the other end of the same pipe.

MR. SMITH: Exactly.

MR. WOODS: And this other end is the over end of the other pipe?

MR. SMITH: Exactly.

MR. WOODS: Can you tell whether that pipe is bevelled from any- 10
thing before you? A. Yes, a slight bevel on the inside.

Q. And what is the purpose of that bevel in connection with the welding? A. To get the weld on to the bottom to see that your fusion is complete.

Q. Now looking at Exhibit 45. Has the welding material got through to the bottom of the weld at that time? A. No, sir.

Q. Where is the end of the fusion or of the welding material? A. Right above at the top side. There is the adhesion point at the top of that groove. I assume this represents the inside of the pipe—the photo- 20
graph. It must be according to the lines of the weld. Yes, that is the inside. It never has been welded there. There has been an adhesion on the top of that bevel and from that point it was welded up.

Q. And what do you find, looking at Exhibit 45, running between the bevel and the adhesive material? A. I find evidence of cavity here on this black just above here (indicating).

Q. Now look at Exhibit 46. And do you find the welded material going through the pipe in that exhibit? A. No, it is not through the pipe in this exhibit.

Q. And what do you find above the "V" notch? A. I find evidence of lots of cavities in the weld itself. 30

Q. Anything else? A. That is all I can see so far—evidence of lots of cavities.

Q. At the top or at the inside of what you call the "V", is there anything of significance about that black line that is shown on the photograph? A. Yes.

Q. What is it? A. That line shows conclusively the adhesion point.

Q. What is the adhesion point? A. The black part here is the adhesion point where it never was welded. The weld started from the adhesion point and went to the top of the weld.

Q. Just explain that to the Court. A. This part has never been 40
welded and from the top part of this black line they started to liquefy it and build it up.

Q. What is the black line? A. The black line indicates it has never been joined.

Q. I am not a welder and you will have to correct me if I do not ask you the right questions. A. Sure.

Q. You have the pipes coming together that are bevelled in the way you have mentioned? A. Yes.

Q. And you have a weld made in which there has been no fusion at the inside of the pipe as you have described? A. Yes.

10 Q. Now what is the effect of that bevel or notch under such circumstances so far as the strength of the weld is concerned? A. So far as the strength of the weld is concerned you have actually placed that weld in a position where you have made no provision for crack propagation. The least pressure and there would be a fracture.

Q. Do you mean by that, that the effect of that "V" shaped structure there begets a crack? A. Yes, it is there for you to start it. If there is any move at all it is there to start it.

20 Q. And what is the effect of the propagation of a crack on the strength of a weld? A. It has everything to do with it. If you calculate the area of that weld you will find the weld will not be very far from being an iron oxide.

THE COURT: Where are the portions of this pipe 45 and 46?

MR. WOODS: This pipe was taken up and in the course of taking it up there was more strain on it and it would not be of any value to the Court to give any tests of the strength of the weld as they found it then because it had been so weakened in the course of taking it up so that that information would not be of any value, so tests of the strength of that weld are not going to be submitted and it is not scientifically possible to get a true test of the material in the ground. We have taken that on each end. Here is the weld in question. Here is No. 45, the weld at No. 45
30 where the other pipe joins there, and here is the weld—two welds on each side of that.

THE COURT: Are they not shown on Exhibit 28 in the plan on a twenty foot pipe?

MR. WOODS: No. 45 is that welded joint there on Exhibit 28 towards the west of the weld in question going westward. That is the way it is and this 45 is the weld to the west on Exhibit 28, and 46 is the welded joint to the east of the weld in question on the pipe shown on Exhibit 28. These photographs are taken of those two welds showing the condition that has been described by the witness. The reason we are
40 now taking out these with my friend's consent, Exhibit 43, is to cut out of the very weld in question a piece of the material and produce a photograph of it similar to the photographs 45 and 46, at the very weld in question.

THE COURT: But without there being any separation of the piece which you are going to take out.

MR. WOODS: It will just be a piece as marked in white chalk there, which is the same.

THE COURT: In the centre of which the weld would be?

MR. WOODS: Yes, right over the weld in order to show the same condition.

MR. SMITH: Well, my Lord, this is quite cracked now.

MR. WOODS: I am not doing that for the purpose—I am doing that for the purpose of producing a photograph of the weld in question to see this “V” shaped thing that is on Exhibits 46 and 47 and 45 at the very weld in question. 10

MR. SMITH: I am pointing out this weld is cracked already and you can perceive it with the naked eye. It will carry the “V” right up the metal. You can see that.

CROSS-EXAMINATION BY MR. SMITH.

Q. When did you begin welding? Did you say? A. 1928.

Q. And you had no knowledge of the art of welding in 1923? A. No.

Q. So that the evidence that you are giving with respect to what is and what is not a good weld refers to the period in your lifetime from 1928 on? A. Yes. 20

Q. And you are making a mistake in reference to using the word “adhesion”. Weren’t you referring to the lack of fusion? A. The welding term is “adhesion”—the liquid metal from the rod on to a surface of the pipe which is in a molten condition.

Q. Now I asked you if you were not using a wrong word when you were using the word “adhesion”? A. No, sir.

Q. You did point out to the Court that on this Exhibit 42 there was a lack of fusion of the ends of the two pipes, which is apparent on the weld itself? A. Yes. 30

Q. Then tell me what your adhesion is? A. The adhesion is starting to build from that point which has never been in a liquid condition. There is a part of your pipe there never was in a liquid condition, that is the plain part.

Q. That seems to be very apparent to me, very apparent indeed, but what is the adhesion? A. Getting the molten metal from the welding rod on to a part of the pipe which has never been in a liquid condition.

Q. And you observed that where? A. I observed that from there. There is the top of the adhesion line.

Q. What you are pointing out to me is a portion of this pipe which has never been fused with the other pipe? A. Sure. 40

Q. And there is nothing on there at all. You just see the butt of the pipe? A. Yes.

Q. And that is what you call adhesion? A. No, I call adhesion where the top of this one-eighth here has never been in a liquid condition, and you are getting the welding rod in a molten condition and building in an upward fashion.

Q. Well I am not any wiser yet. Now I suppose your greatest criticism of this weld is that there is not a perfect penetration? A. Exactly.

10 Q. And this bevel which you pointed out to the Court, are you suggesting that is a welder's bevel? A. What do you mean?

Q. That that was a bevel put there by a welder in order to make his weld and give the "V" shape at the bottom? A. They do not generally bevel pipes.

Q. Are you suggesting this bevel was put there for the purpose of welding, or not? A. That might have been made in the manufacture or cutting off the machine.

Q. Well what are you talking about it for if it is not of any importance? A. What do you mean?

20 THE COURT: Well, you were saying something about a bevel which I understood had something to do with the welding? A. No, the idea is there was a bevel.

Q. MR. SMITH: Well then let us forget about it if it had nothing to do with the weld. A. It was the defending counsel mentioned the bevel.

THE COURT: Defending whom? A. Well—Mr. Woods.

Q. MR. SMITH: Able counsel and able engineer, and now he is a welder, but I am not. Now this small bevel has nothing to do with any criticism you are making of this weld? A. No, that could have been
30 filled in all right.

Q. And I imagine too that small bevel was put on there in the factory for the purpose of handling the pipe? A. No.

Q. Well then we will forget it. Let us stop right there. However, it is quite obvious that there is a lack of penetration? A. Most decidedly.

Q. It is quite obvious that these two pipes were not welded together over their entire surfaces? A. Quite correct.

Q. And it is also quite obvious that there are gas bubbles in the weld? A. Yes.

Q. Not unusual? A. Would not be if it was a proper weld.

40 Q. Do you know the allowance of bubbles or gas cavities per square inch of any well known welding society, Scotland, North America? A. No.

Q. You do not? A. No, I have no evidence of that.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 42
James Kidd
Cross-Ex-
amination
continued.

Q. Then if there is a tolerance granted by way of gas cavities in a weld of so many to the inch— A. Yes.

Q. And this does not exceed it, you are not going to complain about the cavities you can see there, are you? I am telling you that is the fact, if you want to know. A. The principal point of this weld—I do not say the gas cavity was the principal thing that made it a weak weld. I said it was a lack of penetration that made it a weak weld.

Q. You did go to the trouble to show some gas cavities and they can be seen by the naked eye? A. Very few with the naked eye.

Q. But you could see some a minute ago? A. Yes. 10

Q. And my eyes are not bad, and you will admit I could see some? A. Yes.

Q. And we are even again. What are you talking about these cavities for unless you are prepared to tell the Court that there are so many gas cavities as to make it score? But you have taken it out of the jurisdiction and into a very technical standpoint. A. Very technical standpoint, if you like to mark the case. I am not concerned about that. I am giving evidence on the type of weld from a welder's standpoint.

Q. Are you going to tell me that you, by looking at a weld, can form any opinion of anything near its strength, are you? A. Well, you 20 can.

Q. No? A. You can.

Q. So that any observations you have made of this weld will permit you to— A. I said you can. I said the weld has never been properly penetrated and it can be observed by the naked eye and—

Q. What I am saying to you is this, that having observed your lack of penetration that you told me of, can you from that, form any nearly correct idea of the strength of the weld? A. Yes.

Q. What is it? A. Welds run by a number of tests have been found to be about seventy-five per cent. of the strength of the original 30 material. That is said to be one quarter pipe. There is almost one-eighth has never been welded at all. So if you only get seventy-five per cent. within the whole area and you have one-eighth not welded that brings you to fifty per cent.

Q. Seventy-five per cent. Do you mean a one-eighth of an inch? A. One-eighth never penetrated.

Q. And you say that because our pipe has not fused we would have a weld whose strength would be thirty-seven and one-half per cent.? A. Oh no. I make that fifty.

Q. Why do you make it fifty? A. Oh yes—I see it. Yes, thirty- 40 seven—that is right.

Q. There is no doubt about that? A. Yes.

Q. Now I want you to take a look at this other piece of pipe. Look at the back of it. That is Exhibit 43. You see the bead built up on the back? A. Yes.

Q. Would you modify your thirty-seven and one-half per cent? A. Well that is only on the surface.

Q. Well granted we put metal on there and we have not blown it up with bubbles. Assume that it is the same sort of thing you have been looking at on these other pipes. Assume that that is the same kind of weld metal, won't you add something to your thirty-seven and one-half? A. This metal is not the same.

10 Q. I said assuming it is good weld metals in this bead wouldn't you add something to your thirty-seven and one-half per cent? A. No, not if you did not weld it all the way up. Your idea is if you got a weld on the surface it is a strong weld.

Q. I will say this to you—suppose I butt these two pipes together and I never make any penetration at all and I put a sleeve of the type you see there, it will hold these pipes together to some extent? A. Yes.

Q. And therefore it is stronger than if the beading were not there at all? A. No.

Q. Is not that simple to you? A. No. I am talking about if you hit it with a hammer.

20 Q. I don't care if you hit it with a tooth pick. Isn't it stronger? A. No, it is not.

Q. You were talking about a "V" and as I wrote down what you said, that would propagate cracks? A. Yes.

Q. That would be perfectly true with a straight bar? A. Yes it would be true with anything.

Q. Do you agree with me that that would be true with a straight bar? A. Yes. We will take the bar for the meantime.

30 Q. And we will bend it where you have a "V" put into the joint and it will cause a crack? There is no doubt about that? A. What did you say?

Q. We have a bar and we do not completely penetrate and we have a "V" from the bottom of the weld? A. Yes.

Q. And we apply pressure on the bar and the "V" will no doubt open up a crack? A. Yes.

Q. Now take a pipe and we have welded the pipe and partial fusion and we have a "V" at the bottom? A. Yes.

Q. I bend down the pipe and your "V" is pressed? A. On one side only.

40 Q. It is going to break on the bottom and on that side your "V" is pressed? A. Yes.

Q. So that "V" cannot propagate a crack if the action is to press it together? A. If you tighten a "V" you put a tension on the weld.

Q. So, shortly put, your position is this, that with a rounded pipe with a "V" as in this photograph, that being pressed down that pipe it would tend to close the "V?" A. Yes but you have to have "V's."

Q. Tending to close that "V" then that "V" would not propagate

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 42
James Kidd
Cross-Ex-
amination
continued.

cracking at that point? A. That "V" will cause you to put a tension on the weld on the one side and you are compressing the weld on the other.

Q. Then you will probably agree with me that a pipe which has a certain strength when the weld is pulled, you know what I mean—say we have a section out of this weld and we pulled it directly? A. Yes.

Q. And we find it has a resistance of so many pounds? A. Yes.

Q. Your view would be that by pressing on the top of that pipe it is setting up strain on the bottom, that that strain would be partially taken up by contraction at the top. Do you follow me? Isn't that what you said—partially taken up by the pressing together at the top. Are you going so far as to say that when I break a welded pipe by pressing down on it the fact that the top part is pressed gives greater strength to the bottom? A. No it does not because you are deliberately putting a tension on the bottom. You are pulling apart at the outside of the weld.

Q. You mean on the other side of the pipe? A. Yes.

Q. Let us leave that out. Let us take this weld at the bottom of the pipe. You will agree with me that compresses the "V" in the bottom of the pipe? A. Yes.

Q. And if I compress a "V" I have no tendency to crack it? A. If you are pressing the "V" this outside is detached and you are pulling it about.

Q. I am speaking of the final break? A. Well that is how you get your final break.

THE COURT: Perhaps you will tell me what significance you intended me to get from the reference to the gas cavities? A. The gas cavity, according to our friend, he makes out a certain number.

Q. Who are you referring to? A. Mr. Smith. The gas cavity can be either increased or decreased according to the flame you are using in your blow pipe.

Q. All I want to know is what significance you wanted me to take or expected me to take or thought I should take from your reference to the gas cavities? A. The gas cavity produced a weakness because the gas cavities have been caused by oxygen which will form iron oxide, setting up a dry material which will form weakness in the weld.

Q. Then you did intend that part of your evidence to have some relation to the strength of the weld? A. Absolutely.

Q. And I understood you to recede from that in cross-examination. A. I don't know.

MR. WOODS: What forms those gas cavities? A. As far as oxy-acetylene welding is concerned they can be extended by using a flame which has an excess supply of oxygen. When you have that, the hot iron rapidly combines with the excess presence of oxygen to form a compound known as iron oxide and it goes into the weld and reduces the strength of the weld because it is in a metallic condition. It is a chemical compound.

THE COURT: Is this your first appearance in Court as a witness?
A. Yes.

Q. Either here or in Scotland? A. I have never been in Court before and I hope I do not come back again.

Q. I hope your manner will be a little different when you do.
A. Yes.

At 3:20 Court adjourns.

At 3:35 Court resumes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 42
James Kidd
Cross-Ex-
amination
continued.

10

No. 43.

Evidence of Edward Herbert Boomer.

No. 43
Edward
Herbert
Boomer
Examina-
tion.

EDWARD HERBERT BOOMER, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. You are on the staff of the University of Alberta? A. Yes.

Q. And what Department? A. Department of Chemistry.

Q. And how long have you been on the University staff? A. Since 1925.

Q. And have you specialized in anything in particular there?
20 A. Apart from my academic duties I have carried out research on Alberta's natural gases.

MR. SMITH: I am quite prepared to admit that Dr. Boomer's qualifications are such as permit him to give expert evidence on gases. I am glad to do it.

MR. WOODS: You are a member of the Research Council? You do not need his academic qualifications.

MR. SMITH: I will admit he is a very capable man and able to tell us a lot about gases.

Q. MR. WOODS: You made a special study of Alberta natural gas?
30 A. Yes.

Q. Both in the Viking field and in the Turner Valley? A. Yes.

Q. We have the gas that is used here and that is in question in this action or that forms the subject matter of this action, and that is the Viking natural gas? A. As far as I know, yes.

Q. And you regard yourself as specially qualified to speak with regard to the behavior of that gas? A. I do.

Q. You have been in Court most of the time, as much at all events, as your academic duties allowed you? A. Yes, Mr. Woods.

Q. And you have heard the witnesses describe what happened, the firemen witnesses and the other witnesses? A. Yes.

Q. And such witnesses as you have not been able to listen to you have had notes of what they said? A. Yes.

Q. Now there has been an explosion described here. How would you characterize that? I am speaking of the very first one. A. I would say the explosion could be caused by natural gas in the basement of the hotel. It is characteristic of a natural gas explosion.

Q. You have made a thorough investigation at the instance of the plaintiffs along with, sometimes in connection with Professor Morrison, 10 and sometimes by yourself? A. Yes.

Q. Into the possible causes of that explosion? A. Yes I have.

Q. And what conclusion have you arrived at as to the cause of the explosion? A. Well, it is my opinion that gas—natural gas escaping from the break in the intermediate pressure main of the Northwestern Utilities at 107th Street in the lane south of Jasper got into the hotel basement in sufficient amounts to cause an explosion when Mr. Christie lit the match as reported.

Q. Now where would the explosive gases be concentrated? A. In the basement. Viking gas is lighter than air. It would rise in a higher 20 concentration near the ceiling of the basement than near the floor.

Q. Will you outline without my questioning, because you are much more familiar with this than I am—go on and tell the Court just what your conclusion as stated is based upon? A. You mean from the beginning?

Q. From this point. On what is your conclusion based? A. Well, that is based on a number of factors. First, there was a relatively large amount of gas escaping at this break. I am informed it was one hundred and fifty cubic feet per minute. There were channels by which the gas could get from that break into the hotel basement. First and possibly the 30 most important, the street railway return cable box which has been described as being in poor condition at the intersection of 107th Street and the lane south of Jasper, porous, if I may say, and would permit the entry of gas into that box. Furthermore, there are natural fissures, cracks, and narrow openings in the soil itself may offer a passage for the gas. There is also the boundary between the gas main and the soil about it. The gas would follow that boundary up the pipe. There is also the fact that there were spaces between the pavement and the earth under- 40 neath the pavement. Subsidence had occurred there. I cannot say whether subsidence occurred all the way from 107th Street to the hotel but certainly it had occurred in places leaving spaces of half an inch between the earth and the pavement. All of these, particularly the cable box, offered a passage for the gas up the lane no doubt in both directions, east and west. Behind the hotel the return cable box was in poor condition. It was surrounded, as I observed, by very porous backfilling material, the backfill material extending from the south wall of the hotel

to the return cable box. Gas entering that cable box or passing up the lane would find an easy escape at the point behind the hotel through this porous backfill material. The material would offer only slight resistance to the passage of gas.

Q. May we stop there to illustrate what you did, by some photographs. These exhibits now marked 32 and 33, do they assist in illustrating your remark about the porous nature of the backfill and the condition of the return cable? A. Yes, they do. They show the return cable box exposed under the pavement behind the Corona Hotel at a later date than I saw the backfill material and it shows the character of the backfill material also as being porous.

Q. Now then go ahead with your narratives. A. It was my opinion the gas could get to the hotel along the route I have outlined to the south wall, that offered an easy means of escape for that gas that was being liberated at 107th Street. The brick wall at the back of the Corona Hotel, as I observed it at the fire, did not appear to be a very good wall. And in any brick walls when they are old they are porous—are permeable to natural gas or other gases. In addition, this brick wall had several openings in it that would offer a route for the gas to follow from the backfill material into the hotel basement. These openings were where the service gas line entered the basement, where the electric line and power conduits entered the basement and in the neighborhood of the coal chutes in the brick construction there.

Q. Do these photographs which I am now showing you and which are now in as Exhibits 21, 22 and 35 illustrate what you mean, and if so, will you point it out to the Court? A. Well this photograph Exhibit 35 shows the service gas line entering the hotel and it passes through a hole in the brick wall which is larger than the pipe and offers a point of entrance of gas to the hotel. As far as I could judge by inspection after the fire, that hole had never been sealed with concrete or anything else. This photograph Exhibit 21 shows the entrance of the electric light and power conduits to the hotel at one side of the coal chute. Those are the conduits coming in. They were not sealed as far as inspection after the fire could determine, of the bricks between where they pass and the space between them would offer an entry for gas. Exhibit 22 is another photograph of the electric light and power conduits.

Q. And No. 13, in your memorandum, which has not been marked as an exhibit yet— A. Yes that is another illustration of the electric light conduit. And there is another one. There were other openings besides, observable in the wall.

Photograph showing light and power conduits entering basement of hotel, marked Exhibit 47.

THE COURT: This is all with a view to showing gas got into the hotel? A. This gas got into—

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 43

Edward
Herbert
Boomer
Examina-
tion.

continued.

MR. WOODS: Go on. A. There were eight other small openings observable generally at the joints between the bricks and the mortar through which gas could enter. Photograph, Exhibit 15, is one.

Q. Is that an illustration of that? A. That is an illustration of one of these small holes to which I refer, a photograph of the south wall on the inside of the Corona Hotel showing a small hole between adjacent bricks.

Q. Can you tell us anything that is now shown on that photograph that you yourself observed as to the condition at that place shown on your No. 15, which will be now Exhibit 48. 10

Photograph showing part of south wall, marked Exhibit 48.

Q. What did you observe? A. I observed after the fire on the inside of that wall at points such as this above the various holes through that wall, unmistakable evidence of the effect of a flame on the brick wall. The flame originated at these holes and would curl upwards. The brick work above these holes showed signs of spawling, that is, the surface chipped off as bricks do behave when they are heated, as in the holes themselves, some of them, there were traces of soot. That photograph was of one of these holes but it has not developed. That was one of these holes with evidence of the flame coming through the hole on the brick work. In some cases we observed soot and traced it back two or three inches into the wall, as if the flame had originated in the wall and come out to the surface. That is shown on some of these photographs, in one particular instance where we lifted out the bricks and exposed the sooty channel where the flame had come in. We could observe the soot. 20

Photograph showing soot marks on brick wall, marked Exhibit 49.

Q. Is that the one that was taken specially for that purpose? A. That was taken for that purpose. One area in particular at the left hand side of the photograph shows the soot. It appears as the shadow but was actually soot exposed after we removed off a brick or something like that where there were traces of soot upon the brick above. 30

THE COURT: Do I understand you to say you found indications from which you could say that the natural gas had burned in these places?

A. Yes. Gas had burned coming through the brick wall. It was burning as soon as it met enough air to burn in behind the brick and the gases burning outside it spawled all the bricks above there and left traces of soot back in the wall which we could follow.

Q. You got a channel for gas and now you say there was gas? A. This was evidence of it in the brick work, so I believe.

Q. MR. WOODS: Soot would be formed if there was not enough air? A. If there was not enough air to form combustion. 40

Q. MR. SMITH: A yellow flame, doctor? A. That is an arguable point.

THE COURT: As far as I am concerned it does seem to me that there was a channel through which gas might have come from the break in the main. There is at least that.

MR. WOODS: Well I think we will go through with the evidence. Now these openings, as well as the other ones that you observed in the wall—where were they with respect to the pavement level? A. Most of them were three to four feet approximately below the pavement level, possibly two feet or so below the basement ceiling. They were all in the upper half of the wall.

Q. Now I have here a chart. This is a photograph of the— A. This is a photograph of the daily temperatures and barometric pressures for the month of February, 1932.

Photograph of barometrical chart for February 1932, marked Exhibit 50.

Q. Will you go on without any suggestion from me, as to what the effect of these weather conditions were on the phenomena you referred to? A. Well, the weather conditions immediately preceding the fire in question were to some extent favorable to the occurrence of the fire and may offer some suggestion as to the time that the break in the pipe occurred. They are all interesting from several points. First, there was a south wind blowing daily from the 18th to the 22nd, except on the 19th. The 19th was calm according to that record. The barometer was dropping steadily, the barometric pressure was falling steadily on the 18th and 19th. It rose rapidly all day on the 20th, that would be the Saturday, to a maximum which was reached at 6:00 a.m. on February 21st, the Sunday. Now if this break occurred on the 18th or 19th the barometric action, that is the dropping barometric pressure would have accelerated the release of gas from the soil and it is highly probable that the escape would have been noticed if the break had occurred then. On the 20th, however, with this rapidly rising barometric pressure the tendency would be to confine the gas to the soil, the gas escaping at the break would to some extent take the place of the air that would naturally rush into the soil with a rising barometric pressure. After 6:00 a.m. on February 21st the barometer started falling again and continued to do until noon February 22nd. These are only approximate hours, I may interpolate, because the chart is very small. This falling barometer of February 21st would stimulate the escape of gas from the soil if at that time the leak had developed. If at any time after the 21st the leak had developed, the escape of gas from the soil would be assisted and stimulated. With the falling barometer the soil loses some of its air content. Now the easiest line of escape for that gas from the soil, so far as I can judge, was into the basement of the Corona Hotel. The weather conditions confirm other evidence in as much as they were favorable to

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 43
Edward
Herbert
Boomer
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 43

Edward
Herbert
Boomer
Examina-
tion.

continued.

the things that did happen. They suggest moreover that the break occurred before the 20th, that it may have occurred any time after. Finally, in connection with the weather conditions it may be pointed out that the barometer was falling at noon on the 22nd. The soil along that lane was saturated with gas escaping at the break. Even after the gas at the break had been vented, the falling barometer would assist the escape of gas from that soil possibly along the easiest route into the Corona Hotel. I cannot say anything about the duration of that or the amount of gas that might be involved, but it is possible that the barometer would assist the escape of gas after the leak had been stopped. 10

Q. You mean after the vent pipe was put out? A. When the escaping gas had been prevented from going up the lane. I believe the soil had been saturated with that gas for some time and the falling barometer would stimulate its escape.

Q. There have been some suggestions, and I am going to ask you to cover them pretty thoroughly as to some of the origin of the fire and the lighting of an inflammable mixture of gas and air coming into the hotel in the way you mention. Now in the first place is that a conceivable thing in the light of your investigations? A. It is not conceivable to me for a variety of reasons. This is inconceivable to me, that the gas observed burning at this pipe, the gas that may have caused the explosion experienced by Christie—it is inconceivable that that gas could have originated in the hotel building itself, certainly in the early stages of the fire. There are a variety of reasons for that. I cannot find, myself, any reasonable sources of gas within the hotel. I will take them up in detail if you wish. I cannot understand the gas flames along the south wall of the hotel on the outside in view of the prevailing wind and the prevailing draft at any fire. And further, in view of the fact that these flames came from under the pavement or between the pavement and the hotel wall where there was no combustible material, it is possible they may have come from the inside of the hotel but if they did they came in opposition to the prevailing wind, and, more important possibly, in opposition to the draft set up in any fire. 20 30

Q. Does the localization both of the fire and flames both inside and outside of the south wall in the early stages of the fire give a conclusive indication as to whether the gas came from outside the building or inside? A. It is evidence gas did not come from inside the building because all the materials in the hotel or in the Motor Car Supply Company premises that could generate gases were north of that south wall. The prevailing south wind would create a gentle draft through the building from the south side to the north side. Gases generated in the building would be expected at the north end instead of at the south end. The localization of the fire at the south wall at the beginning makes it highly improbable, if not impossible, for any material in the hotel to have been the source of the gas observed. 40

Q. Now will you kindly tell us what the character of Viking natural

gas is and as to how it becomes inflammable, whether it is dangerous or not? Describe it generally? A. Well, the natural gas as I know it, as distributed in Edmonton, is a dry gas and contains about ninety-five per cent. paraffin hydrocarbons. Nearly all—the simplest hydrocarbon, methane—the gas is 92.4 methane. That was in 1929 and it has not changed to any great extent since. The gas is dry. It is free from moisture. It is also free from any hydrocarbons that will condense to liquids in temperatures normal to Edmonton. It is free from hydrocarbons. It was found at the wells free from sulphur. As it is distributed in Edmonton at present
 10 it contains small amounts of the vapours of odorous sulphur compounds. Now pure gas before odorization or as supplied at the time of the Corona Hotel fire—

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 43

Edward
Herbert
Boomer
Examina-
tion.

continued.

MR. SMITH: I wish to register an objection to anything in respect to odorization after the event. There is no doubt we supplied gas in its natural state at the time of the fire. I am objecting to any evidence being given with respect to the odorization of this gas subsequent to this fire. In Toll vs. C.P.R.—

THE COURT: If the evidence is being put forward for the purpose of showing negligence, it having been something that happened after the
 20 event, is not such evidence—the admissibility of odorization having been adopted after the fire—will be admitted by me if it is desired to put it in, but as I understand it, it is not evidence of negligence. Indeed, I am not sure, under the Toll vs. C.P.R. case, what it is evidence of. But if it is desired to give it, I won't exclude it.

MR. WOODS: There is no evidence given by Dr. Boomer that has anything to do with it.

THE COURT: Except what the witness stated that brought Mr. Smith to his feet.

MR. SMITH: I am of a suspicious disposition and the evidence is
 30 this, that the gas as supplied in Edmonton now contains some odors.

THE COURT: That is what Mr. Smith meant.

MR. WOODS: Dr. Boomer was going on to describe the gas and what it contained and I interrupted him to point out that that evidence is already in. But his evidence is not directed to anything about it. There was evidence given by Mr. Garrett and it is already in as to that.

THE COURT: I rather gather that Mr. Smith's objection, repeated, was ex majore cautela.

MR. WOODS: All right, my Lord.

Q. You are going on to say that the pure gas— A. The gas supplied
 40 in 1932 in February.

Q. Prior to the Corona Hotel fire? A. —had a very faint odor.

Q. And what does it come from? A. It reminds me of a faint oily or paint-like odor. It may be traceable to oil or paint used in valves and joints in the pipe lines.

Q. When does it become dangerous—that is the Viking natural gas?

MR. SMITH: Do you mean when it gets to the Corona Hotel?

MR. WOODS: No. A. The Viking natural gas is a dangerous material at any time it is not under control.

THE COURT: Is this with a view to showing it is a dangerous substance within a certain line of cases?

MR. WOODS: It is evidence tendered to the Court in support of the Statement of Claim—yes, sir. A. It is a dangerous substance when not under control because, mixed with air, it will form inflammable mixtures, and possibly explosive mixtures. It is not dangerous otherwise, being non-poisonous. It would be dangerous only when in high concentration, the oxygen of the air would be reduced to asphyxiation level. Such a mixture would not explode, however. 10

Q. You have told us it is lighter than air. What is the ratio? A. It is lighter than air, but having a gravity of sixty per cent. of the gravity of air. It will diffuse, that is, it will spread through space and porous materials about twenty-five per cent. faster than air. 20

Q. When will flame propagate through a mixture of the gas in the air? A. Flame will propagate through mixtures of Viking gas with air when the percentage of Viking gas in air lies between five per cent. and fifteen per cent. approximately. The limits cannot be defined sharply because they differ with the temperature and pressure and the shape of the container and to some extent the nature of the ignition. If the gas mixed with air is in that proportion in that inflammable range and is in a confined space it will explode and usually will explode when it is ignited.

Q. What is the explosion of that gas, what type? A. The explosion is what is sometimes called a non-detonating type of explosion. By that I mean the gas mixed with air on ignition does not detonate at pressures near the usual atmospheric pressures and temperatures within the atmospheric temperature range. Such non-detonating explosions characterized by relatively slow flame speeds, in Viking gas five to ten feet or thereabouts per second, would represent the velocity with which the flame and the compression wave would travel through the gas. It would be characterized by moderate pressure rise. In the confined space such as a room the pressure rise might be anything up to fifty pounds per square inch. The pressure is slowly developed. Again, relatively speaking, the pressure is developed in the times of order, six, seven or eight tenths of a second and as a consequence the effect of the explosion is an expansive bursting effect. The sound is rather a dull sound—a thud. It may sound 30 40

with a sharp loud noise but if it was heard and compared with the sound of the explosion of hydrogen gas the difference would be evident. It could be made evident at any rate.

Q. What is that? A. The difference in the sound from a natural gas explosion and the sound from gases that detonate is readily evident when the comparison is made. The non-detonating explosion as characterized by natural gas, it gives you a thud or rumble or thunder at a distance. And it may be compared to a vibration in the air. A detonating explosion is characterized by various flame speeds. The classification is on the nature of the flame speed and the nature of the compression we have developed. Flame speed in detonating explosions is in excess of two thousand feet per second as compared to five to ten in this non-detonating explosion. In fact a non-detonating explosion cannot have a velocity greater than the velocity of sound in air which is about one thousand and ninety feet per second.

Q. Will this Viking natural gas detonate? A. It will not detonate in any mixture of air.

Q. The detonating explosion is like a crack? A. It is a sharp crack. It has a shattering effect and does much more serious damage than a non-detonating explosion because of its detonating effect and the compression we have that accompanies the explosion.

Q. Now will you give the Court information such as you know as to what circumstances affect the color of the flame of this Viking natural gas and whether under what circumstances it is one color and under what circumstances it is another color? A. Well the color of the flame from Viking natural gas is a property that depends upon a variety of factors and without a knowledge of most of them or all of them one cannot say from the color of the flame anything about the gases. It might be as I say—a Viking natural gas flame—it may be anything under circumstances such as held in the Corona Hotel fire, from a complete blue to an almost complete yellow. The color varies with the amount of air that is mixed with the gas before it is burned in contact with more air. That is just one factor. For instance, the mixture of Viking gas with air, in referring to proportions, thirty of gas to seventy of air, will not explode or propagate a flame, but when allowed to come into contact with air, may be ignited and will burn in the air with a blue flame. If the air content in the gas is reduced much below seventy per cent. a yellow tip appears in the flame. If such air content is reduced further and approaches zero, the yellow part grows, extends from the tip downward toward the base of the flame until finally when there is no admixture with the gas before it is burned, the flame is almost all yellow except for a thin blue sheath surrounding the whole flame and a dark blue area at the base of the yellow part. Such flames may give out a very small amount of soot. If you increase the air content much above seventy per cent. the flame remains blue. It changes in certain physical appearances but it remains essentially

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 43

Edward
Herbert
Boomer
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 43

Edward
Herbert
Boomer
Examina-
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continued.

blue as the amount of air is increased. At ninety per cent. or thereabouts or eighty-five per cent. air, the gas mixture becomes such that it will propagate flame and may explode. Then, if the velocity of the air-gas mixture feeding the flame is greater than the velocity of the explosion wave, say greater than ten feet per second, the flame will go out. If the velocity of the air-gas mixture feeding the flame is less than ten feet per second and if the air content is above eighty-five per cent. the flame will flash back and you may have an explosion at the source of the air-gas supply. Now that is just one factor of the air content of the gas, before burning, that influences its color. Other factors are the amount of pre- 10 heating from the mixture. If you take a thirty per cent. gas-air mixture which is blue approximately and heat it before you burn it, and pass it through a heated origin, it will become yellow. It will become luminous again, and to make it blue it is necessary to add more air than seventy per cent. On the other hand, if you have a luminous or yellow flame and you allow the yellow flame to strike a cold object, the yellow flame will become blue and lose its luminosity.

Q. How about sparks? A. If there are sparks in the flame it is almost certain that another source of supply of gas is feeding gas to that flame. Viking gas, or natural gas, or any pure gas burning which does 20 not show sparks in the flame—the sparks usually being associated with burning wood—coal and the gases given off these burning objects carry with them solid particles of the burning objects which form sparks.

Q. How about soot with regard to the burning of these? A. Viking natural gas does not deposit, does not form soot in any great amount. It does form soot when it is burned in air without having had previously any air mixed with the gas. It will deposit large amounts of soot on any cold object inserted into the flame but its burning does not give a streamer of soot rising from the flame such as you see in a gasoline flame or coal oil flame or such flame as that. 30

Q. Now from your investigation did you come to any conclusion as to whether natural gas was being fed to the fire during the course of the fire? A. My conclusion is that natural gas was fed to the fire, that natural gas was the cause of the fire, that it was present in the basement, the concentration of explosive gases was near the ceiling, because Christie lit his match and held it over his head and the explosion resulted and he was burned about the face and head and shoulders rather than lower down. The gas could get to the hotel from the break and that path from the break to the hotel was, as far as I can find out, the path of least resistance for the gas to take. And that path has been checked by 40 the smoke test. The quantities of gas that could get to the hotel are difficult of estimation. However, it is certain that a large amount of gas went up that return cable box. According to the smoke test the first place between 107th Street and the hotel where the return cable box was in poor condition, was behind the hotel. And some of the gas certainly would

escape from the return cable box behind the hotel. Some of it might go on behind the return cable box past the hotel. The amount that would do so would depend entirely upon the amount of gas flowing in the conduit box and the distance from the back of the hotel to the next point in the box where gas could escape. If the quantity is large and the distance flowing to the box is large, the majority of the gas in the box would escape into the hotel. Apart from the return conduit box, my knowledge of the conditions in the lane are such that the gas seeping along the gas main itself along the outside surface and following under the pavement
 10 would find the first means of easy escape behind the hotel.

Q. Mr. Smith, I think, asked a question of Mr. Haddow, that if you take a volume of air or gas going down a twelve inch pipe and if you had a branch off that pipe of a smaller pipe—he seemed to be under the impression that in order to get that air or gas to go down the smaller pipe there would have to be a reduction of the area of the pipe off the branch, that is to say, that the pipe would have to be reduced. Do not forget that in the morning I want you to tell what you know on that subject.

THE COURT: Does the question whether this was a gas fire or not depend upon whether someone lit it with a match? A. No, sir, I do not
 20 think so.

Q. I mean was ignited by means of something like a match? A. No, sir. The gas can be lit by other means than matches—open flames.

Q. There must have been something at the time; the gas must have come in contact with something of that kind to have caused this fire? A. Yes, it is necessary that the mixture be ignited by some means.

Q. What kind of means. That is what I want? A. A flame, an electric spark, a hot wire, a red hot object. That just about includes them all.

30 At 4:30 Court adjourns till 10:00 a.m.
 Wednesday, January 24, 1934.

Wednesday, January 24, 1934,
 Court resumes at 10:00 a.m.

MR. WOODS: At adjournment last night you were telling us that the gas went down the conduit box and entered the hotel as you have stated. Now what significance is there in the burning on the outside of the south wall, as given in evidence, of the gas? A. Well those gas flames on the outside of the back wall between the pavement edge and the brick wall could only be due to a supply of gas external to the building. They originated at a place where there was no combustible material,
 40 that is, under the pavement. They burned there all night, which is contrary to the usual behavior of flames at a fire.

Q. You mean during the night? A. Yes, inasmuch as there is a strong draft created in the fire giving rise to an inward flow of air at the

*In the
 Supreme
 Court of
 Alberta*

Plaintiffs'
 Evidence

No. 43

Edward
 Herbert
 Boomer
 Examina-
 tion.

continued.

bottom of the fire. The low temperatures prevailing at that time would also give rise to a flow of cold air down into that crack and into the building rather than having gas come up out of the crack into the atmosphere. In addition, there is the fact of the south wind. If the gas by any chance did originate in the building, the south wind would drive it to the front, or Jasper Avenue side of the building, rather than out at the lane side of the building.

Q. Now I have some photographs which are not yet in, which will illustrate what you are saying. I am showing you two other photographs that are not in. Will you illustrate what you mean by that photograph, Dr. Boomer, and tell what it is, what part of the basement it is. A. Well this is a photograph of the basement at the corner where the steps leading into the basement were located. It shows the corner where the water supply and gas supply came into the building just at the eastern edge of the unexcavated portion under the kitchen. It shows evidence to my mind of flames that did not extend below the point in the south wall six feet or thereabouts above the floor of the basement. That is, it shows that the fire was confined to the upper part of the basement and under the ceiling of the basement. It is seen most clearly on this picture by looking at the two by four upright attached to that rear wall and supporting one corner of the stair platform. This piece of two by four is apparent only in its upper half and not apparent in its lower half. In addition, there is under the stair platform a few pieces of wall board which were covered with an inflammable fabric. Those pieces of wall board did not appear to have suffered from the fire in any way. The brick wall shows traces of spawling, that is the breaking off of the brick surface because of the application of intense heat to the brick surface. I observed this personally before the photograph was taken and it was evident that the line of fire shown by the traces on the brick wall never did go below a point about six feet above the basement floor. The conclusion was a gas fire, the gas entering the building through the brick wall.

Photograph of south wall of basement showing spawling of brick and burned joists, marked Exhibit 51.

Q. Looking at Exhibit 51, will you point out where the gas service pipes that served the hotel are on that photograph? A. The gas service pipe is the upper of the two pipes in the right hand side of the photograph. The entrance to the building is not shown, however.

Q. Is your Lordship following that?

THE COURT: As far as I think it is necessary I am following it, I mean necessary for me to do it at the moment.

Q. MR. WOODS: Will you point out the upright to which you referred on that photograph as to anything significant in the joists near the service pipe? A. The post I referred to is an upright post about the

centre of the photograph supporting the left back side or attached to the left back side of the stair platform. The joists making that stair platform showed traces of combustion on their lower edges, those traces of combustion becoming less at the top edge of those joists where the traces of fire were very slight.

Q. Have you sufficient familiarity with the building to indicate to the Court where those joists would go westward from there, or do you know?

A. I am afraid I don't understand you.

10 Q. I am speaking with relation to—point out the kitchen floor. A. The kitchen floor is this line of concrete about the middle of the right side, just above the middle of the right side of the photograph.

Q. And underneath that line of concrete there is a black space shown? A. Underneath was the unexcavated portion under the kitchen. There was dirt under that concrete floor.

Q. Was there a space? A. There was an interstitial space—I could not say exactly—between the concrete and the door.

20 Q. You spoke of the spawling of the bricks along the line of the wall. Will you show where it is specially shown on that photograph? A. It is especially shown on the left side of the photograph centre and below the holes observable in the brick wall which were resting points for joists originally. The spawling extended from a line about three feet below those holes up to and somewhat above the holes.

Q. Can you put your finger on any portion of the photograph that you call spawling? A. On the left side of the picture about one-third of the way up on the picture.

Q. Perhaps my eye sight is not as good as yours. A. These bricks all have had their surfaces chipped off, typical of the action of heat.

30 Q. You put your finger on this photograph at the line of bricks running horizontally as they do immediately below the dark spaces in the photograph that you have described as holes for the joists? A. Yes.

Q. Now what is this that we see at the bottom right hand side of the photograph? A. That is a piece of wall board.

Q. What is it made of? A. I cannot say as to what it is made of—gypsum largely with fabric and paper covering on each side.

Q. There is paper on it? A. I could not swear to that. It was some type of fabric, cotton.

40 Q. Was it material that would easily burn? A. It was material that would not burn easily but it could be burned and would show if in contact with flames. The fabric part that was angling down loose there would certainly be destroyed by flames.

Q. Has that been in contact with flames? A. There was no evidence of flames on that wall board.

Q. Exhibit 36. Can you further illustrate your remarks by reference to Exhibit 36? A. Exhibit 36 is a photograph of the same region of the basement after the debris from the fire had been removed. It shows pos-

sibly more clearly the fact that that piece of two by four that was left on the wall was exposed to flames only on its upper portion. It shows where the gas pipe came into the building underneath the stairs.

Q. Will you permit me to interrupt you at that point by reference to the last exhibit? I notice that this is taken on the 3rd of May, this photograph Exhibit 36, and Exhibit 51 in taken on the 26th of March. Will you tell me whether that gas supply pipe in No. 36 which is shown as hanging down to the floor is the same gas supply pipe as is shown on Exhibit 51 not hanging down? A. Yes those are the same gas pipes.

Q. So the conclusion necessarily would be that the gas pipe in Exhibit 36 came to its position as shown there after Exhibit 51 was taken? A. Yes.

Q. Now I want you to point out to me on Exhibit 36 where the electrical conduits come into the building. A. The conduits entered the basement just at the left side of the left hand coal chute illustrated on Exhibit 36, right here (indicating).

Q. Now we have a rather better photograph of those conduits and I want to develop the matter there.

THE COURT: Exhibit 36 has it written on has it not? A. Yes, sir (indicating).

Q. MR. WOODS: You see the same electrical conduits in Exhibits 22 and 23? A. Yes, sir.

Q. And I am now particularly referring to Exhibit 22, a small one, which shows a break or a hole in the electric conduit. Do you observe that? A. Yes.

Q. Now we have evidence here that I think you heard of, and Mr. Chappelle spoke of the same phenomena—that is the electric lights in the building flickering first of all and then going out in the whole building. The time of that occurrence as I remember, subject to correction, varies, but taking an estimate of the lapsed time I think it was said to be fifteen or twenty minutes after he heard what he mentions as a sound as though that wall of the building had been hit by a truck. Looking at the photograph what would that evidence indicate to you? A. It indicates primarily that a short circuit occurred in the conduit.

Q. Will you describe what is inside the conduit? A. There were two cables—the remains of two cables I should say—that carried electric current into the building.

Q. Were they insulated? A. They had been insulated originally. They had been insulated before the fire. During the fire the insulation had been destroyed by heat.

Q. And the destruction of the insulation — would that suggest to your mind intense heat? A. It would suggest moderately intense heat. It is difficult to—

Q. Do you know what the insulation—

MR. SMITH: Let him finish. A. It is difficult to understand what is meant by intense heat.

Q. MR. WOODS: Can you tell the character of insulation? A. From the remains—no. But the fact that the insulation had been destroyed suggests that it could only have been compounded rubber asphalt insulation—the common insulation of electric cables.

Q. I do not want to use any term that is not understandable. Will you describe the amount of heat that would have to be employed at that fire in order to destroy insulation to such an extent that there would be a short circuit in the electric current? A. Certainly, a temperature of twelve hundred degrees Fahr. would destroy insulation. That is, put descriptively, a dull red heat.

Q. Coming in close contact? A. Yes the application of flame sufficient to bring that outer conduit to nearly a dull red heat would result in the destruction of any compounded rubber insulation.

Q. Would the fact of the flickering of the flame of the lights in the hotel before they went out altogether have any significance to your mind in showing the cause of the lights in the hotel going out? A. I am not prepared to say other than it might indicate a partial short circuiting—
20 an arcing—between the cables not sufficient to fuse them together or to destroy the conduit box but sufficient to reduce the power supply to the lights to an appreciable extent.

Q. In what way could the lights of the hotel go out? How could all the lights in the hotel go out? What ways are there? We have one—a short circuit? A. The lights in the hotel could be put out otherwise than by short circuit by someone opening the main switch supplying the hotel with electrical power.

Q. If someone did that would the lights flicker before they went out? A. If one opened the switch the lights would not flicker. They
30 would go out at once. If he played with the switch they would flicker.

Q. Does the fact of the lights going out some fifteen or twenty minutes after what we will assume is the dull explosion—does that fact indicate to your mind the presence of gas heat at that time? A. It does in as much as a supply of gas coming through the lights at those conduits and burning was the only source that was evident to me of the necessary heat to destroy the insulation and cause the short circuit.

Q. Is there any other kind of fire that would generate that amount of heat in that length of time other than fire from gas coming into the lane? A. I do not think so for a fire initiating fifteen minutes before a
40 short circuit.

Q. I am going on with this photograph that is also a portion of the south wall and illustrating your remarks as to the spawling of the brick? A. This is the west wall up to the corner of its intersection with the south wall.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 43

Edward
Herbert
Boomer
Examina-
tion.

continued.

Q. I was wrong. It is the west wall of the basement of the Corona Hotel? A. Yes.

Photograph of south wall of basement after debris removed, marked Exhibit 52.

Q. Will you illustrate your remarks about the spawling of the brick on the upper line of that basement rather than on the lower six feet, by reference to that photograph? A. Now, Mr. Woods, this particular wall showed only slight traces of spawling, here and there. It was a painted wall painted white originally. On the upper half of that wall the paint had been completely or nearly completely destroyed. In the lower half of the wall the paint was still there in fair condition. It showed signs of hav- 10
ing been dried out but nothing more.

Q. I was mistaken in calling that spawling. That was a painted wall? A. Yes.

Q. I am showing you Exhibit 35 which is the portion of the south wall and which you had before in another connection, showing the gas supply pipe coming into the building. What condition did you find there just above that gas supply pipe or in that neighborhood? A. Just above that gas supply pipe the evidence of fire on the brick wall illustrated by the spawled surface was much greater than at points removed from the area just above the gas supply pipe, indicating more flames or intenser 20
flames playing along that wall or up that wall above the hole where the gas supply pipe entered, that occurred at points to the west or to the east of that hole.

Q. Do you find any evidence of spawling below the pipe there? A. No there was no evidence of spawling below the pipe at all. That is illustrated in the photograph fairly well.

Q. Did you find any condition as to soot at that point? A. There were traces of soot at that point that appeared to mark the boundary of the flames. The traces of soot were in the form of a spreading line or- 30
iginating at the side of the hole going upwards. They were very faint.

Q. What would the presence of soot, even to the extent that you do say you saw it, indicate? A. The burning of a gas containing hydrocarbons in an insufficient supply of air.

Q. And is that gas supply pipe where it comes into the building at a corner of the wall? A. It is just at a corner of the wall—eight inches or so to the east.

Q. And just below the ceiling? A. Just below the platform to the basement stairs.

Q. Now those indications are of a light gas fire? A. Yes.

Q. Now just at this point I would like to get quite clearly from you 40
the different gases that could be present. I gather from what you said that there are gases that are heavier than air and there are gases that are lighter than air. That is right? A. Yes.

In the Privy Council.

No. of 1935.

*On Appeal from the Supreme Court of Alberta
(Appellate Division)*

BETWEEN

NORTHWESTERN UTILITIES LIMITED
(Defendant) Appellant,

AND

LONDON GUARANTEE & ACCIDENT
COMPANY, LIMITED, AND OTHERS,
(Plaintiffs) Respondents.

RECORD OF PROCEEDINGS

VOLUME I.

Page 1 to Page 450

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For the Appellant.

BLAKE & REDDEN,
17, Victoria Street,
S.W.1.

For the Respondents.

27 CO F 1935

In the Privy Council.

No. of 1935.

**ON APPEAL FROM THE SUPREME COURT OF
ALBERTA (APPELLATE DIVISION)**

Between

NORTHWESTERN UTILITIES, LIMITED

(Defendant) Appellant

and

LONDON GUARANTEE AND ACCIDENT COMPANY, LIMITED
AND OTHERS

(Plaintiffs) Respondents

RECORD OF PROCEEDINGS

VOLUME II.

Page 451 to Page 900

Q. What are the heavier than air gases? A. Do you mean that might have occurred in the hotel or any heavier than air gases?

Q. Well I do not want you to cover the whole gamut of heavier than air gases. But direct your remarks as much as possible to whatever gases might have been present so far as your information of what was in the air goes by the burning of material in the hotel? A. Well it is possible that gases could have arisen under specified conditions from some items in the stock of the Motor Car Supply Company, namely rubber goods, which would produce gases heavier than air. Secondly, lacquers if open
10 might produce vapours that are heavier than air; gasoline, lubricating oils, greases under destructive distillation and open might produce gases heavier than air.

Q. What are the lighter than air gases? A. In the hotel it is destructive distillation of wood, paper, garbage and such like, would produce gases that would have about the same density, the same specific gravity. Coal which was known to be in the basement of the hotel would produce gases under destructive distillation that are lighter than air and lighter than Viking gas. To the best of my knowledge they are the only
20 gases that could have been produced from materials on the premises.

Q. And what are the lighter than air gases? A. Coal gas which is a mixture principally of hydrogen and methane.

Q. And what other lighter than air gas apart from coal? A. Well hydrogen is lighter than air, carbon monoxide is about the same or slightly less heavy than air, and hydro - carbons such as acetylene and ethylene are just slightly lighter than air. Offhand I do not know any more.

Q. We have gas seen burning between the edge of the pavement and the brick wall within a very short time of the outbreak of the fire. What would you say as to that phenomenon with regard to the possibility of
30 this fire being the result of the ignition of that heavier than air gas? A. I do not believe it is possible, for a number of reasons. First, these gas flames appeared very shortly after the reported explosion at widely separated points in the building along a considerable distance of the outside south wall and the south kitchen wall inside—inside the elevator—inside under the basement steps. The development of those flames in such a short space of time after the explosion at levels above the basement floor—considerably above the basement floor—suggests the accumulation of a comparatively large quantity of a light gas in so short a time. And it is impossible that it could have been derivable from any material in the
40 building. Furthermore, any gas derivable from material within the building apart from the specific gravity would have a strong and readily detected odor and the accumulation of any gas from any source within the building would take time and it is almost certain that the odor would have been noticed and some sort of an alarm given. Viking natural gas being nearly odorless is the only gas I know of that could be present and

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 43

Edward
Herbert
Boomer
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*
—
Plaintiffs'
Evidence
—
No. 43
Edward
Herbert
Boomer
Examina-
tion.
continued.

could accumulate over a period of time in sufficient quantities to produce the observed effects without being detected.

Q. What would you say as to the possibility of the spaces between the wall being impregnated with Viking natural gas without being observed prior to the fire? A. I would say it was quite possible and in the time required to form an explosive mixture. In the basement it is almost certain that a large amount of that gas would get up in the spaces inside the walls—in the spaces between the plaster and the brick work.

Q. We have evidence of firemen who saw a fire on the south wall of the kitchen which they have described and I think you have heard, if not all some of it, and of one of the firemen who put his pick through the south wall and had the flames jut out. What would you say as to that? Is that what you would expect from what you have been describing? A. Well I would not expect a jet except under very special circumstances. I would expect upon the opening of that wall to see flames—to have gas flames burn up the wall, but I am hardly prepared to predict a jet unless the up-draft in the fire had been developed to a very great extent which might cause the gas to issue in the form of a jet.

Q. I spoke of the fireman with regard to that jutting. He said he put his pick in the wall and the fire came out of it. 20

MR. SMITH: Hargrove used the word "jet".

MR. WOODS: I have in mind the Browning man who said he hit the wall with his pick and fire came out at two different places.

THE COURT: Those two witnesses seemed to be speaking of two different phenomena. One was described as a jet and the other a larger flame.

MR. WOODS: May I correct your Lordship? Hargrove and Browning went into the kitchen practically simultaneously and Hargrove said he saw a jet, he saw fire on the south wall of the kitchen. I don't know whether he is the man who says he saw it where the plaster work came off or not but we will assume for this purpose there was plaster came off but Williamson describes that fire as coming through where there was some plaster off. Hargrove and Browning were in there almost immediately after Williamson and he said he put his pick in the wall and fire came out. It is the same fire at the back of that kitchen wall. 30

THE COURT: The same fire, but their description—

MR. WOODS: It is all at different times maybe.

THE COURT: But the one who spoke of the jet. Was that Hargrove?

MR. WOODS: I don't know. He spoke of seeing the fire on the south wall. 40

MR. SMITH: He used the word "jet". He is the only one who did.

MR. WOODS: I just want to get away from the suggestion your Lordship indicated that it was a different fire.

THE COURT: Oh no. My expression was that they seemed to have observed different phenomena. That is all I said and I do try to make my statements accurate as well as concise.

MR. WOODS: I was under the apprehension that your Lordship had the impression that this fire was a somewhat separated fire that these men saw.

10 MR. SMITH: I have not any doubt that Mr. Woods later statement is correct. I do not think it is of any great importance but I do say that Chief Hargrove was there first and Browning came and then assisted Airth to the hotel and the chief saw a jet of fire and Browning came and stuck his pick into the wall, and the note I have is that he put his pick into the wall and "A flame shot out."

MR. WOODS: What I have to say is this, the evidence of Hargrove and Browning about that, in my submission, it is not conceivable that a person could come to any other conclusion than that the fire, that those two men saw, the one shortly after the other, came from a fire
20 behind the kitchen wall between the kitchen wall and the brick wall. They were in there where Dr. Boomer indicates it might be.

Q. I would like you now to indicate to us in greater detail why you eliminate the possibility of gas fires caused by the burning of various substances that we have indications of were in that building at the time. Begin with rubber? A. Rubber, that is to say compounded rubber, as it is used in modern articles like tire or cement and vulcanizing materials in general is a staple article. Compounded rubber does not ignite of its own accord at ordinary temperatures. It is not subject to spontaneous combustion. Heating rubber results in its decomposition and the gases
30 produced are heavy gases, containing considerable hydro-carbons, considerable carbon monoxide and carbon di-oxide, some hydrogen sulphite, some sulphite di-oxide. There may be other constituents depending upon rubber. This gas has a very disagreeable repulsive odor.

Q. Does that come from sulphureted hydrogen? A. In parts, yes. The gas is highly poisonous due to the content of carbon monoxide and hydrogen sulphite and sulphite di-oxide. Those three gases are all poisonous, carbon monoxide possibly the least poisonous.

Q. We have evidence here of three gentlemen being in the premises of the Motor Car Supply Company in the main part upstairs in the effort
40 to collect some books or records which Mr. Colin McKenzie wanted to get. The time was after ten o'clock at night at all events. Two of those gentlemen, their sense of smell is unimpaired. They went in and they collected these records from a space some little way from the front door.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 43

Edward
Herbert
Boomer
Examina-
tion.

continued.

Coming up into that room there is an open basement steps to the basement and further behind on the west portion of their premises there is another open basement steps to the basement underneath. The basement underneath going down to some rooms in the basement in which are kept a large quantity of rubber tires—Firestone tires—racks of them. If those rubber tires had been burning at that time is it possible that those men would not have smelled it? A. I believe those men would have smelled it if there had been any fire in that stock of rubber tires, even combustion, the burning of rubber in a limited supply of air gives out a smoke that is unmistakable, possibly not described as fumes, but decomposed rubber in the absence of air, but certainly unmistakable. 10

Q. What is the effect of burning rubber on smoke and what is the character of the smoke? A. The smoke from burning rubber is very black and highly charged with soot. It resembles in some respect an oil fire in that way.

Q. Is there any evidence that in any way shows that gases from burning rubber initiated or sustained the fire in its early stages? A. All the evidence goes to show that gases from those fires—that rubber stock—could not have initiated or sustained the fire in its early stages. There are a number of reasons. First the heavy nature of the gases that would be produced from the tires would result in their concentration at floor level. Their distinctive odor would result in detection, and lastly, with regard certainly to part of the tire stock there was a salvage and the condition of the east wall of the Motor Car Supply Company's basement where tires were stored is or was in such good condition as to indicate that no high temperatures had existed in that region where tires were stored. 20

Q. Is that a picture of the east wall? A. That is a picture of the east wall on Jasper Avenue. And the wall is, in the basement area at least, in relatively good condition and does not show the effect of fire to the extent that the south wall of the basement showed it or the east wall above the basement level. 30

Photograph showing northern part of east wall, marked Exhibit 53.

Q. I do not know what is in this Exhibit 17 but I think that is an inventory of the stock of the Motor Car Supply and I cannot tell you whether there were any lacquers in stock. But we will assume for the purpose of my questions that there were lacquers in stock. Will you direct your remarks to the possibility of gases burning and the possibility of lacquers being there? A. Well lacquers are a mixture of anywhere from three to ten constituents all of which, except the pigment are inflammable. In some cases the pigment is inflammable. The modern lacquer is a solution of pyroxylin in a volatile solvent. There is usually added some natural gums plasticizers or other liquids and substances known as brush resistants to produce the finished article. All these substances are highly in- 40

flammable. Pyroxylin which may make up twenty-five per cent. the weight of the lacquer is a nitrocellulose, that is a relative of gun cotton very similar to celluloid and is highly inflammable and dangerous. These lacquers themselves as made up or any of their constituents are not subject to spontaneous combustion. They are perfectly safe if kept in closed containers and are safe to use normally when precautions are taken not to vaporize them or put lighted flames near them. The decomposition of these lacquers by heat results first in the evaporation of the volatile solvent that forms heavy vapors all of them much heavier than air and they are all characterized by a rather sweet odor. The typical solvent would be ethylacetate. It has a nice sweet odor. And the others, alcohols and ethers, the odors are not unpleasant and they are distinctive. The other constituents—castor oil may be a constituent—give rise to odors of decomposition. The pyroxylin will decompose possibly as soon as any of the heavier constituents such as castor oil and the odor from pyroxylin is unmistakable, being pungent and acrid due to nitric oxides. It is highly poisonous and can result in rapid poisoning when inhaled. All, I think I can say, about these lacquers is first they would give rise to vapors and odors which are unmistakable if they had been exposed to heat and only when exposed to heat. Further, as I understand it, they were all kept in containers. Before the vapors could be released in the building it would be necessary for heat in sufficient quantities and intensity to raise the pressure within those containers to a point where the containers would burst and the lid come off. Then, and only then, would explosive vapors and inflammable vapors from these lacquers be liberated in the building.

Q. And would that make an explosion that one could hear? A. It might result in an explosion when sufficient heat reached the stock of lacquers to result in the destruction of the containers. A great deal of inflammable vapor would be liberated.

Q. And how would any such gases that are formed by the ignition of vapors from this class of material act? A. Well, assuming the vapors were produced in the early stages of the fire those vapors being heavier than air would sink and fall to the lowest possible level—the basement floor.

Q. Now will you take up the matter of any question of the possibility of gases being formed from the burning of lubricating oils or greases or gasoline? I think there was suggested a small quantity of gasoline? A. Well these materials are not subject to spontaneous combustion. They require a source of ignition before they become dangerous. The lubricating oils and greases and such like are very stable materials. They have high flash points and fire points relatively speaking and when they are vaporized or decomposed the explosive vapors that may originate in them are heavier than air and sink to the floor. Further, on burning they produce a great deal of black smoke unless burned under perfect control in a furnace. Gasoline represents a much bigger hazard

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 43
Edward
Herbert
Boomer
Examina-
tion.

continued.

than such things as lubricating oils and greases, but too produces a heavy vapor. The vapors that arise from gasoline on evaporation are heavier than air and seek the lowest level mixing slowly at the same time with the air. The mixing is very slow. The amount of gasoline in the premises would not begin to account for the quantity of gases necessary in the explosion that initiated the fire.

Q. Now I think I covered all the gases unless there is something else occurs to you. Summarizing, what you say about that, what would your opinion be as to the possibility of this fire as we have had it described originating from gases created by the burning of material in the Motor Car Supply Company? A. No part of the stock of the Motor Car Supply to my knowledge is capable of producing the effects observed in the early parts of the Corona Hotel fire. The distinctive odor, the heavy vapors, the distance those vapors would have to travel to get to the origin of the fire on the south wall, make it impossible, to my mind, to say that the fire originated in the Motor Car Supply Company's premises. 10

Q. I gather from what you said and I thought it was more or less common ground, there is no doubt in your mind that this is a gas fire? A. There is no doubt in my mind, no, sir.

Q. Now will you come to coal gas—the possibility of this fire being initiated by the igniton of coal gas? A. Well coal gas can be produced in comparatively large amounts by the destructive distillation of coal up to five cubic feet per pound of coal. It is a gas that is lighter than air, lighter than Viking gas for that matter and is highly inflammable and when mixed in the proper proportions with air it will explode and in fact usually detonates. That is the kind of gas you get from the complete destructive distillation of coal giving a product, coke. Lower temperatures or partial combustion produce less amounts of combustible gases and it may quite easily be that partial combustion, combustion that is able to sustain itself, produces a gas that would not explode under any circumstances. The burning of coal in any of these processes is greatly changed, the surface changes in its appearance, coke may result if the temperature is high enough if it is the combustion of the coal that is occurring. Coal is subject to the phenomenon known as spontaneous combustion and may occur in coal piles sufficiently deep and insufficiently ventilated. The gases produced in spontaneous combustion are smoky, contain combustible gases but are not explosive usually when mixed with air. They are, moreover, readily detected. That is true of any gas that may be generated from coal. The odor of the pure coal gas is unmistakable. The gases that might be produced by partial or spontaneous combustion in the coal pile are odorless and smoky and readily detected. It is highly improbable in a small coal pile such as existed in the Corona Hotel basement that spontaneous combustion did occur. If it did occur the time required to produce sufficient gases to give rise to the observed effects would be considerable and it is certain that someone would have noticed the smoky odor associated with it. In that I am not admitting it 30 40

was possible to get an explosive mixture from the gases of spontaneous combustion. That is, I believe, the chief points in regard to coal gas.

Q. Reverting again to this fire on the south wall that is outside the building between the wall and the lane that occurred, according to the evidence, would it be possible to have gas generated from coal such as was in that bin that would keep up that kind of phenomena during the night? A. I do not believe so, no..

Q. And while we are passing. You mentioned coke. What have you to say about that? A. Well coke under conditions such as existed at the fire would not generate combustible gases in any amount. It is not readily ignited, it does not generate gases on heating except under general specified conditions.

Q. Did you examine the coal that was visible near the south wall after the fire? A. Well I examined the coal that was present in the coal bin near the south wall on March 23rd.

Q. MR. SMITH: It was not a coal bin then? A. It was in the position where the coal bin once had stood. It was under the debris from the fire that had come down from the upper part of the hotel and was still there. Some of the coal was visible and we removed bits of brick and what-not to see more coal. It showed no evidence of heating or combustion and there were no ashes in the surface layers and it still possessed its usual shiny black surface. The nearest approach to fire in the coal which could be determined by an examination of the brick wall behind us was within two feet above the surface of the coal. There was no sign of combustion on the brick wall and the bricks were in very good condition and the mortar in very good condition. It is not surprising that the coal was in good condition. The coal chutes were opened in the early stage of the fire and smoke and flame issued from these coal chutes and large amounts of water were poured down these coal chutes which ultimately would rest upon the coal or pass through it and protect the coal from the fire that is above it. The continued issuance of smoke or flame from these coal chutes could only be explained by a fire from the ceiling whereby a gas fire on the brick wall between the coal chutes—

MR. WOODS: Was it over the coal? A. Yes.

Q. Now will you direct your attention to the possibility of this fire as we know it having arisen from the burning of paper, wood, garbage or any such material as that? A. Well first the destructive distillation of paper, wood, vegetable or animal scraps for the production of inflammable gases, cause small amounts of inflammable gases which do not under circumstances that could exist in an ordinary room under normal conditions, explode. Even inflammable gases when mixed with air do not explode. The partial combustion or the destruction of such materials in a limited supply of air results in a less inflammable gas, and a gas that could not explode either. Such gases are dangerous chiefly because of

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 43

Edward
Herbert
Boomer
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 43

Edward
Herbert
Boomer
Examina-
tion.

continued.

their poisonous nature.. The chief inflammable constituent of the gas from the destructive distillation of paper, wood or vegetable matter is carbon monoxide and it is a matter to illustrate the possibility of these gases being the cause of the fire. An explosive mixture of carbon monoxide in air requires at least twelve and one-half per cent carbon monoxide. A person could not survive one minute in an atmosphere containing twelve and one-half per cent carbon monoxide. It is improbable, it is almost impossible, that such gases originated at the fire. Poor adjustment of the boilers or garbage burner, improper combustion in the boiler furnace or garbage burner, would give rise to these gases—carbon monoxide—but no explosive mixture could develop that gases could be burned, that they would propagate a flame when mixed with air. I do not see how gases from any of these materials or gases from improper operation of the boiler, for instance, or the garbage burner could have caused the fire because they would not form explosive mixtures nor would they be so very poisonous. 10

Q. Now apart from that the other thing that is in my mind—I do not know whether it has been suggested — is the possibility of sewer gas getting into the basement. Will you direct your remarks to any gas known as sewer gas? A. Well the sewage can generate inflammable gases that may often form explosive mixtures with air. The sewer gas is largely carbon dioxide and methane and is produced under conditions of anaerobic fermentation. 20

Q. What is that? A. Fermentation in the absence of oxygen supply. To produce a sewer gas in quantities requires that not only the air in the sewers but the sewage itself should be comparatively stagnant and still. And Edmonton sewers are well ventilated by vents provided and my information from the city is that they are well drained also and sewage does not accumulate in them. In addition abrupt barometric changes from the 19th to the 21st February, 1932, would materially assist in the ventilation of the sewers. On March 5th, 1932, I supervised the taking of two gas samples from the sewer at 107th Street and the lane south of Jasper. The barometer had been steady for two days previous and only changed by five one-hundredths of an inch on that day. So that the sewer system would be ventilated only by the vents provided and not with any assistance from the barometric variations. One sample was taken about two feet under the manhole cover before the manhole cover was disturbed. The other sample was taken at the bottom of the manhole on the up-stream side of the sewer, that is the east side of the sewer. These samples were analysed by me and proved to be normal air within the limit of air in the analytical apparatus used. They did not contain positively hydro-carbons in amounts greater than one-tenth of one per cent which is the limit of air of the apparatus. It is my opinion that sewer gas can be eliminated entirely because it is not generated in the sewers in any appreciable quantity. 30 40

Q. Now you have heard or it has been reported to you certain evidence with regard to the possibility of the explosions that we have evidence of that took place in that manhole about eleven o'clock at night, two of them, as near as can be judged from five to ten minutes apart or thereabouts. And they have been described—blowing off the cover of the manhole and up into the air. From your knowledge of the circumstances and what you have heard in evidence what would be the most likely explanation of that phenomena? A. The most likely explanation would be that the explosions were due to the presence of natural gas escaping from the break at 107th Street into the sewer system. The up-draft created at the fire would make itself felt through the sewer system by means of the vent pipes at the hotel building. That up-draft would result in the flow of whatever gases were available into the sewer system at other points removed from the fire. Air would flow in through openings that were available and at the manhole "A" gas might well be sent into that manhole because of the draft flowing in the direction of the hotel. The mixture of air and gas could come out at the hotel and be ignited by flames at the fire. This ignition could result in a flash back into the sewer system and an explosion in the sewer system. The description by Mr. Barnhouse of what he heard indicates such a flash-back running through the sewers under the lane to the manhole at 107th Street.

Q. The sound that he heard or felt under his feet? A. The sound that he heard might be described as typical of methane air or natural gas air explosion.

Q. Did you take any samples of air under the pavement of the lane? A. Yes.

Q. When? A. In the morning of May 11th, 1932.

Q. Where? A. Under the pavement of the lane at the rear of the Corona Hotel I had it identified as the west of the telephone pole and east of the coal chute.

Q. How many samples did you take? A. I only took one sample of twenty litres from the soil about four inches under the pavement and four feet from the pavement edge. A hole was drilled by means of a soil augur and a twenty litre sample was drawn through that hole by means of a glass tube that was inserted to the bottom of the hole and that sample was discarded and a second twenty litres drawn for analysis.

MR. SMITH: May I raise an objection to this? It seems to me that a sample of air or gas or whatever it may be taken in March or April, two months after this fire, when you consider changing conditions—

THE COURT: Well he may go on.

MR. WOODS: What was the result of your analysis of that sample? Will you tell the Court? A. The samples had very nearly the composition of air. There was a trace of combustible hydro-carbon just detect-

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 43

Edward
Herbert
Boomer
Examina-
tion.

continued.

able with the apparatus. In four different analyses on the sample the average was one-fifth of one per cent of combustible hydro-carbon.

Q. Of combustible hydro-carbon. What is that? A. Well in such small amounts I am not able to say, but methane is the simplest and commonest hydro-carbon.

Q. Methane is the principal constituent of Viking gas? A. Yes.

Q. From your knowledge of the conditions what would you say as a scientist as to there still being traces on the day you took that sample of the natural gas in the soil or in the air under that pavement from the time that it escaped on the 21st February? Would you like to say? A. 10
I would not like to say. I have no idea.

Q. Is there anything else that you have not covered that I have not asked you about that might conceivably be the origin of that fire except natural gas? A. There is nothing else that I can conceive of, in the light of my knowledge of the fire.

CROSS-EXAMINATION BY MR. SMITH.

Q. Now I have emerged from listening to your most excellent thesis with one fact upon which we can agree and that is that there was a fire in the Corona Hotel. A. Yes. I agree there.

Q. And also that gas was there from the Viking field? A. Yes. 20

Q. And from an examination of the air sample found underneath the pavement you found more methane there than at your examination of the gas in the sewer? A. I cannot agree there.

Q. As I wrote it down—you found in the sewer, that is in so far as your instrument would go. I take it it was not perfected to carry it any further? A. The instrument would detect one-tenth of one per cent. and that is all.

Q. And you did detect that tenth? A. In the sewer—no.

Q. Combustible hydro-carbon, was in the air? A. If there had been I would have missed it. 30

Q. And should I concern myself with anything you found as being striking in the examination of the earth behind the Corona Hotel? A. Well it would indicate that gas was possibly in that soil to a slight extent, I have not any idea when and where it got there.

Q. There is not much doubt that gas was in the conduit box behind the Corona Hotel, is there? A. No.

Q. You have no doubt about that? A. No, sir.

Q. Neither have I. Now I want to talk about these barometric readings. I am always afraid of things I don't know much about. Now this graph here I cannot read anything. It is in such small print I cannot see it so I will take it as read. Now with respect to the barometric question. As I understand your evidence to be, the striking change in pressure was 40

on the 22nd of February, I have noticed that you have been in great part using manuscript in giving your evidence? A. I must glance at it now and again to be sure that I am right.

Q. I just want to make it clear that you have in part been using manuscript in giving your evidence? A. Yes. I have it here the barometer rose rapidly all over the 20th to a maximum about six a.m. If you look on that photograph you will find the sharpest practically occurred on the early morning of the 20th. It rose very sharply all day on the 20th up to the maximum at six a.m. on the 21st. The barometer fell thereafter
 10 not quite as rapidly as it rose and continued to fall until about noon on February 22nd. I cannot tell you what it did after that.

Q. I suppose your idea is that that being so the gas would come out of the earth? A. With the falling barometer.

Q. Or would it go in? A. With a falling barometer the gas would come out.

Q. And the opposite idea of that is that the earth will become more impregnated on a rising barometer? A. Yes.

Q. And you have not the least doubt that the neighborhood in the area of this break was impregnated with very considerable quantities of
 20 earth with natural gas? A. I imagine that is so.

Q. You would not think there is any doubt about it? A. No.

Q. You are quite familiar with the soil in the City of Edmonton?
 A. I observed the soil there.

Q. And you observed the soil on 107th Street? A. Yes.

Q. And there is no doubt in your mind there would be no difficulty in impregnating that soil with natural gas to a very considerable extent?
 A. Certainly the available spaces in the soil for some distance around that practically would be full of natural gas, maybe mixed with some
 air?

30 Q. Let us get it right. There is no doubt in your mind, knowing the character of that soil as you saw it that it was a soil of a character which could be impregnated with natural gas over a very considerable area? A. No, Mr. Smith, I do not think the area would be very great in that soil. It would spread upward to the pavement and the soil and the amount of gas to saturate that soil would be very small.

Q. We found gas in this soil 200 feet away in the month of May. Now surely in February we would have the soil near the break in a very considerable area impregnated with natural gas? A. Yes, Mr. Smith, I quite agree with you.

40 Q. Now staying with our barometer for a moment. Taking the greatest change you have got. What does it mean in points of air pressure on the earth. A couple of pounds? A. Oh no.

Q. What is it? A. Half a pound to a pound.

Q. Taking it at half a pound. Now having regard to the fact as you know that there are pressure changes in the intermediate gas line in this city of five pounds from time to time? A. Yes.

*In the
 Supreme
 Court of
 Alberta*

Plaintiffs'
 Evidence

No. 43
 Edward
 Herbert
 Boomer
 Cross-Ex-
 amination
continued.

Q. And if there had been a pressure change of five pounds going against your half pound it destroys the barometric theory almost completely. A. There is no relation between the pressure in your i.p. main and the barometric pressure effect.

Q. None whatever—on the gas in the earth and its remaining there? A. With the increasing pressure in your main there would be an increasing flow from that leak. These barometric changes take place over a considerable period of time, you may put it as a kind of breathing by the earth—when the barometer is dropping.

Q. If we have a barometric change making it possible for more gas to come from the earth and in the meantime from the break in our pipe we have an increasing pressure which causes us to put more gas into the earth, then so far as the impregnation of the earth is concerned the change in pressure in the gas main would more than compensate for the barometric change permitting the earth to breathe. It would get across faster? A. I do not understand you. We are talking at cross purposes. 10

Q. You tell me that a barometric change—that one causes the earth to breathe—it goes somewhat faster? A. With a rising barometer, an increase in atmospheric pressure, air moves into the soil. With a falling barometer or decreasing atmospheric pressure air moves out of the soil. If there is a leak in the gas main and the barometer is rising more of that gas that is leaking will stay in the soil than would be the case if the barometer were steady. And if the barometer is falling more of that gas coming out at the leak would escape from the soil into the atmosphere than would be the case if the barometer were steady. 20

Q. Exactly. A. Now it is only a qualitative — it occurs — but the quantitative aspect of it I cannot give you.

Q. Tell me this. One of these firemen saw flames at the back of this building at eight o'clock in the morning? A. Yes.

Q. So this barometric theory of yours—did it have any relation to that? A. Well it is a possibility that the falling barometer, the dropping atmospheric pressure of that morning, would continue to assist or to draw gas out of the soil after the pipe had been vented. I say, definitely, there is only a possibility. 30

Q. I do not think we would have heard anything from you about this barometric pressure problem if this fireman had not slipped and said he saw flames coming out of the back part of the hotel after the mains were shut off? A. No. I wanted to find out an approximate time for the break rather than the other.

Q. The fireman who found flames when you know there were none there at eight o'clock—the barometric idea is to help him out a little bit, isn't it? A. I heard his evidence. 40

Q. And how are you going to help the chief out who saw them going across the middle of the road? Have you a theory to support him? A. No. I decided that the evidence in regard to the flames at the back wall

is sufficient for my purposes. After the first fireman I did not need any more.

Q. And you left the poor old chief out in the cold? A. No, sir, I do not doubt the chief and I do not need his help either.

Q. I was not trying to be either smart or unkind but I was just wondering what you thought of these flames? A. I would suggest it was a crack in the pavement.

Q. And if nobody else saw them what would you suggest? A. That they had been put out.

10 Q. I think that is logical isn't it? A. Yes.

Q. And I think that is the best answer you can give me, isn't it, that if they ever were there they were put out? A. Yes.

Q. And Tom Templeman went up and down there at four o'clock in the morning, and he is not a fireman but a plumber and he never saw those flames there that whole evening after their first appearance, did he, back of the building? A. I will have to take your word for it.

Q. Don't you remember? A. I don't think I heard all Mr. Templeman's evidence.

20 Q. Did you hear that part of it? A. I think I remember hearing about his examination into the basement and that is about all.

Q. You don't remember? A. No, I really don't. I will take your word for it.

Q. Were you there when they conducted a smoke test? A. No.

Q. Well you heard the evidence of a smoke test? A. Yes.

Q. The evidence was this, that with the conduit box open and the line unplugged no smoke emerged from the box except at the holes which had been dug?

30 MR. WOODS: I do not think that is a fair statement. I object, My Lord. That is not my memory as I remember the evidence that Mr. Ruff gave about how the smoke test was made and it was made under his direction. It was that first of all the smoke was put through the conduit box without it being plugged in order to see whether it came up at the holes from the conduit box up.

MR. SMITH: Correct.

MR. WOODS: And after that it was plugged in order to see whether it came out of the box, seeped along the box and came out at the holes.

MR. SMITH: Correct.

MR. WOODS: Now that in my submission does not justify Mr. Smith's statement?

40 MR. SMITH: That is right. What he did say was that the only place when the line was opened was it came out at the holes only. When the line was plugged it came along the box to the holes, that the only place

*In the
Supreme
Court of
Alberta*

—
Plaintiffs'
Evidence

—
No. 43

Edward
Herbert
Boomer
Cross-Ex-
amination
continued.

where smoke was observed was at either side of the airway in the basement.

MR. WOODS: The only place the smoke would be observed at all was at the holes. In one case it came along the box and in the other case it came outside the box and, seeping along the box would come up at the hole. The only place under any circumstance would be the smoke came up at the hole.

MR. SMITH: I am trying to give you again my recollection of the smoke test and I am not going to disagree with my friend's facts. I do disagree with his conclusions. And I add this, that the evidence in this case is that the only place that smoke came into that building was between the air chute and the brick wall during the smoke test. I think you were here and am I not correct? A. Yes, as far as my memory goes. 10

Q. And that was only after the free passage of that smoke had been blocked in the box itself. That is also correct, isn't it? A. As I understood it, Mr. Smith.

Q. So that in all these places, pipes, through bricks and so on, where you have found gas coming in you are assuming that gas came in all of these places and they were not shown by the smoke test? A. Yes. The places where the most obvious traces of gas flames are the gas service pipe, at a few holes in the brick wall and principally around the coal chute to the middle bin. 20

Q. Will you either agree or disagree with me first in what I have said to you? I am saying that you are now assuming gas coming in at these various places where it was not indicated at the smoke test? A. Would you show me on the photograph where the smoke came in?

Q. Yes, between the chute itself and the brick wall it had not been "keyed in." I think someone used that expression. A. I am interested in the chute in question particularly.

Q. It is the air chute back into the road. Now east is towards the hotel (referring to photograph)? A. The west half of the basement. 30

Q. I am showing you another photograph. You recognize the places as the most easterly one which we have been calling "airway?" A. Yes.

Q. And that is the most easterly hole on both of these photographs I am showing you? A. Yes.

Q. The witness has said that the opening in question is the most easterly or the opening on the left hand side of the two photographs? A. That is the opening you are asking me about, yes.

Photograph of south wall after debris removed, chutes and air shaft, marked Exhibit 54.

Photograph of south wall partly removed showing chutes and air shaft, marked Exhibit 55. 40

THE COURT: Fifty-four is before it was cleaned out?

MR. SMITH: Yes, My Lord.

Q. Now I suppose you are aware that some air tests have been conducted with a view to finding which direction from the break, that is east or west, the most of that gas was escaping? A. I do not remember anything about it.

Q. Well I wonder if you won't agree with me that in so far as the wooden conduit box itself was concerned more gas was going west than east. Do you agree with that? A. I don't know.

THE COURT: These two photographs do not look the same to me
10 (Exhibits 54 and 55).

MR. SMITH: You might look at these two again and say whether these two openings are the same, one after being cleaned out and the other before? A. I thought you told me that. I agree, though, that these openings are the same. The difference is the angle. One has been taken at a sharp angle and one taken directly. In one you see the face of that building.

Q. MR. SMITH: You observed from the smoke test that no smoke was observed outside the wooden conduit box without the plugging of the box? A. Yes, I believe that is so.

20 Q. And there is not any doubt in your mind that there was a very free passage for this gas in both directions along that conduit pipe? A. Yes.

Q. Does it go to the power house? A. I have not any idea.

Q. I think it does lead to the power house? A. Yes, ultimately.

Q. What I am really at though, in any experience you have heard of or seen you have found no block to the passage of gas in either direction down that conduit box? A. I have no information as to any blocks or obstructions in that conduit.

30 Q. Yet you are still of the opinion, I take it, that the most of the gas which got into that hotel came from the conduit box? A. Mr. Smith, I think I expressed the opinion that there were several channels. I would not care to give an opinion as to how much went by way of the box and how much went by way of the skin of the pipe.

Q. As I understood you it was then, you said there were several channels through which it might come but it was demonstrated to you that it was in quantity going down the conduit box. Is that a fair way of putting it? A. That is a fair way of putting it.

Q. Now let us talk about the pipe. In your view gas could follow along the outside of our pipe? A. Yes.

40 Q. Then you do not think very much of this bond theory of Mr. Haddow's about freezing our pipe solid to the ground. You do not think much of that? A. Not the way you put it. I do not know the theory.

Q. You think that between the pipe and the earth there was room

for gas to travel along the outside of our pipe? A. I think so, yes, Mr. Smith.

Q. You have a very considerable knowledge of the soil of Edmonton at that place. You saw the soil? A. Yes, I saw it.

Q. Now we all know that fires even fires which are not gas fires are strange and sometimes almost unaccountable things. What I have in my mind is this, that in the absence of natural gas, in a town where they have not any gas it has been most remarkable why fires within a building recur and recur at the same spot that firemen put them out. You have heard of that very thing? A. No, Mr. Smith. I am not a fireman. 10

Q. Well have you seen anybody who is, in this case? A. Yes.

Q. What I have in mind—fire is a difficult thing to control once it gets started? A. Yes, I imagine so.

Q. And there are, I suggest to you again, and you might agree or disagree with me, in towns or cities where there is no natural gas we have the recurrences of fire without any “solid reason” if I may use that expression? A. If I could answer yes or no to that. I don't know. I will have to take your word for it.

Q. Now in so far as these holes are concerned. By the way. Fire, you state, caused the spawling of the bricks? A. Yes. 20

Q. May it not at the same time spawl cement? A. Yes, I should imagine so. I have not observed it in the case of cement.

Q. My information is that it would have largely the same effect. You spoke of several holes in the wall? A. Yes.

Q. And the suggestion I make to you is that the spawling which you see in the brick might have accounted for the disappearance of the cement, granting it was there of course? A. Yes.

Q. That seems reasonable, doesn't it? A. I cannot say, not having considered the spawling of cement or the plugs, if these pipes were sealed.

Q. Does it seem unreasonable that flames that would spawl bricks would also spawl cement? A. Yes. 30

Q. And I stated flames might have spawled the cement so that it disappeared or dropped out. That seems reasonable? A. Yes, I will agree with you.

Q. So that what you found in these holes was evidence that there had been fire around and evidence in some cases I think of traces of soot? A. Yes, Mr. Smith.

Q. And soot, as I understand you, comes from incomplete combustion, does it? A. Yes.

Q. And hence the deposit is made. That of course means that there has been an absence or improper relation of gas and air? A. That is a good way to put it. 40

Q. And I suppose it means an improper relation of gas and air whether that be natural gas or any other gas? A. Not any other gas, but most other gases.

Q. In other words, if you take a stick of wood. If I burned a stick of wood and have it burning and take even a match and put it up in a hole in the wall where there is insufficient air passage by burning that match there I will deposit soot on the hole in the wall? A. Yes.

Q. So as far as these holes in the wall are concerned—and remember I am speaking only from their appearance and nothing more—speaking only from their appearance the most we can say is that soot had been deposited there by the incomplete combustion of something? A. Yes, Mr. Smith.

10 Q. Let me be fair—only from the appearance as you saw it? A. From the appearance as I saw it it was incomplete combustion of something that must have been a gas because we followed the soot traces back in the cracks. There may have been slivers of wood in there but it is highly unlikely.

Q. There may have been anything and I am going to come to the “maybe’s” in a moment. Combustion is the conversion of inflammable material into a gas and it burns? A. Yes.

20 Q. So that where we have a flame of any source which is incomplete in its combustion and coming in contact with a place wherein combustion cannot be complete we may expect soot to be deposited? A. Yes.

Q. I am speaking of things like wood and furniture and so on? A. Yes.

Q. And, turning and only very briefly indeed, to the evidence of flames observed in the building, I take it that you have based your flame in connection with this fire? A. Yes, to an extent.
opinion to some extent on the evidence of flames and of recurring

30 Q. Well now would you tell me what evidence given in this case you have used to make up that factor in arriving at your conclusion? A. The only evidence I have considered in that regard is the evidence of the putting out and recurrence of the flames outside the wall and the flames underneath the basement steps.

Q. And having regard then to a photograph which has been put in by my friend this morning, it is the first one that was put in this morning—having regard to Exhibit 51, you found after the fire a two by four supporting or perhaps attached to or running to the floor landing has been charred in its upper area? A. Yes.

Q. And has not been as much charred in its lower area? A. Not at all.

40 Q. It has not been charred in its lower area. And your idea is there was a flame burning at that height? A. Yes.

Q. And I take it that if the lower area of that scantling were covered by something it would account for it? A. That is the reasonable supposition.

*In the
Supreme
Court of
Alberta*

—
Plaintiffs'
Evidence

—
No. 43
Edward
Herbert
Boomer
Cross-Ex-
amination
continued.

Q. And this photograph was taken on the 26th March, 1932? A. Yes.

Q. And you will also observe there the platform which was the platform of the stairway which we have heard a lot about in this case?

A. Yes.

Q. And the platform of that stairway, at least the supports—the wooden supports upon which this platform rested are still intact after this fire? A. They are still there.

Q. They are not intact because the bottoms of them have been charred? A. Yes, Mr. Smith.

Q. Some of the tops of them have not been charred as much as the bottoms? A. Yes, Mr. Smith. 10

Q. And that could be very easily accounted for because there was a platform on top of those stringers, couldn't it? A. Yes.

Q. And this much is also true that if you light the bottom of a board because that is what it looks like standing on its edge, if you light it at the bottom, the bottom will be more charred than the top if the combustion is not completed? A. Yes.

Q. And this being a place where at least one fireman said that they could not completely put out this fire, it is very hard to understand why this wooden structure is not completely destroyed, isn't it? A. Well I understand that spot got a lot of attention from the firemen? 20

Q. At the early stages. District Chief Hargrove in retiring from there—my impression was that they made an effort to put out that fire on the last occasion and did not fully succeed. But that is neither here nor there.

MR. WOODS: No, I do not think that is right.

MR. SMITH: But the fact remains that here we have a wooden structure unburned in the basement of this hotel? A. Yes.

Q. And the places where you have assumed or established to your own satisfaction that gas came into this basement were largely on the westerly side of the south wall? A. Yes. 30

Q. Is that generally correct? A. Generally correct from that—

Q. In other words, this place where the smoke came in is the most easterly? A. Yes, the area between the three chutes and the westerly wall is the area we examined.

Q. And the point I had in my mind is that this wooden landing is right where you have in your judgment found a considerable portion of the gas entering the building—the pipe right beneath it? A. No, if you look at the photograph underneath that landing there is only one line of spawled brick above this pipe. 40

Q. And this pipe being? A. The gas service pipe.

Q. And you cannot see, if I follow you correctly now, you cannot understand how there could have been any considerable quantity of fire in the neighborhood of that landing, underneath that landing. You

found, as I understand you—I was wrong in suggesting that a considerable quantity of gas in your judgment came in and the answer was no it came in a bit further to the east? A. The only opening under that platform was the opening where the service gas line came in. That was the only place under there we observed traces of the bricks and flames on the wall. The others are over here to the east (indicating).

Q. May I say it follows from that that is not an area in which you would expect much of a fire? A. Well I have not thought of it in that way. The results show there was not a great deal of fire there.

10 Q. That is in an area where you do not think there was much ingress of gas? A. I agree with you, yes I agree with you.

Q. Now it is perhaps out of turn, but I want to clear up one thing. You said to my friend Mr. Woods that in your judgment that gas behind the kitchen wall or walls, I mean coming through the kitchen wall or walls would not burn any without the form— A. I cannot imagine why it should form. I can imagine why it would not. Probably both conditions necessary for one or the other cannot be obtained. I do not know whether they occurred in the fire or not. I have this much to say about that, if the wall between the plaster and the brick were full of
20 the gas lighter than air it would tend to come out in the openings in that wall and if the gas were nearly pure, so that its total difference in gravity with respect to air were available it might come out of the hole half an inch in the form of a curling flame. Well that is a question I have answered to Mr. Woods.

Q. I understood you to say to Mr. Woods— A. I understood Mr. Woods—I thought he spoke of a jet.

Q. MR. WOODS: What did you mean? A. When you spoke of a jet I was thinking of—when I think of a jet I think of the source of supply of gas under a few ounces pressure. It may be a very small jet
30 because of a small hole.

MR. SMITH: Here we have this gas coming through the conduit box, going through this rarefied mixture in the box here, I mean this porous mixture and being porous it contains a light air and somebody has already told me that when these flames reached the building they could be blue because of the quantity of air mixed with them even then? A. Yes.

Q. And we get this gas through the building and we get into the wall between the brick and the plaster and we all know that is an air space, and when we arrived at the kitchen wall there is not much of a
40 story about the insufficiency of air? A. No. It depends on how long the gas had been entering the building as to the concentration of gas in the walls and the space.

Q. Now in the absence of a built up pressure, knowing that the gas in the conduit box was well under five pound pressure— A. I don't know that.

Q. Knowing that, and knowing this travels through the earth, through the wall, up the basement wall, in the absence of a built-up pressure, then that gas would be practically without pressure at all at that point? A. Yes.

Q. And to get a jet you must anticipate that there is pressure behind it? A. You can get Viking gas—a gas lighter than air will flow out of a hole into the heavier medium air. Because of the difference in gravity you can have also, and undoubtedly do have, although I cannot say it was developed to any extent early in that fire—a draft in considerable magnitude which means a reduction in pressure within the structure which would give you a pressure difference. It is the pressure difference which drives the gas. 10

Q. In your words, your suggestion is that if there is a jet in that kitchen wall it would be because of the intensity of the fire, there is not enough air taking up gas and drawing it through the wall? A. What do you mean by jet?

Q. Anything that will come and protrude from a wall? A. Up to an inch, it might be. But an inch jet from an inch and a half hole, the draft would pull it out. It may be that the difference in the gravity between the two gases would. 20

Q. You also remember that at the time the fire appeared in the kitchen wall there was practically no fire in that building? A. Yes.

Q. So we can dismiss this idea when we are talking about that kitchen wall? A. Yes.

Q. Which brings me back again to this, that we have got to go to pressure to find flames of the description given as a jet and we have no pressure, have we? A. Yes. We have no pressure.

Q. And certainly, to dismiss it once and for all, the flame which was described by one of the witnesses as a whirling flame coming from an inch and a half orifice in the wall and extending to eighteen inches long, that is an impossibility? A. I cannot ascribe it to gas leaking in from the break on 107th Street. 30

Q. That flame could not have been caused by natural gas? A. Under those circumstances, no.

Q. Not under the circumstances as you know them? A. Yes.

Q. And as you have described them in this Court this morning? A. Yes.

At 12:30 Court adjourns till 2:00 p.m.

At 2:00 p.m. Court resumes.

Q. You said, having regard to the time of fifteen minutes, at least I understood you to say to my friend Mr. Woods you knew of no flame there sufficiently strong to burn these cables in the conduit, in the fifteen minutes? A. Yes, sir. 40

Q. And I suppose you would extend that to twenty or twenty-five minutes? A. Yes, to any time. It is difficult to say—fifteen minutes to thirty minutes.

MR. WOODS: What is that?

MR. SMITH: You asked the length of time to burn through the conduit. You said a flame of gas within sufficient area in striking a cold object would show blue? A. Yes.

10 Q. You are not suggesting that after that fire was going for a time the back of the building was a cold object? A. No, sir. I was trying to demonstrate that flames from natural gas may be of any color. I was not suggesting anything with regard to that at all.

Q. Now I suppose with your knowledge and experience you would agree with me that there is no such thing yet in this world as a completely tight gas system. There are leaks in any gas system of which you have heard? A. I have not a great deal of knowledge of gas systems and I assume you are correct.

Q. I mean your general knowledge? A. Yes, I would accept your statement to be true.

20 Q. What I have said is— A. Yes. But with my experience it is difficult to define.

Q. And granted that it lasts, you know of no tighter joint between pipes than a welded joint? A. No.

Q. And I want to ask you, as I understand you, and I am not going to quarrel very much with you, you are under the impression that gas at some stage of that evening, of that fire, entered the manhole "A" and came down through the sewage system to the hotel? A. That is my explanation of the explosion in the sewer system.

30 Q. Now we will assume that gas was escaping into manhole "A" and having regard to the change in the barometric pressure, I am suggesting to you that granted the top on manhole "A" had been opened the day before and the vents were opened, having regard to conditions of barometric pressure that gas would go out of the manhole into the air, wouldn't it? I am speaking of the pressure you spoke of as tending toward the gas leaving the ground more quickly. A. That is after six on the morning of February 21st the dropping barometric pressure would assist in the ventilation of the sewer system by drawing the air out of the sewer system.

40 Q. And granted we had been pumping gas into manhole "A" and manhole "A" was vented at the top your barometric action would assist any gas coming upward rather than going downward into manhole "A"? A. That is previous to the Sunday morning, six o'clock on February 21st.

Q. And what change took place on Sunday morning? A. Previous to that. I would have to look at my barometric pressures.

Q. Providing the vents were open. I think I said that to you? A. Yes, I understand the manhole top was off.

Q. In other words, there was room for the escape up? A. On the 20th and up until six o'clock on February 21st, the Sunday, the barometric action would confine the air in the sewers. It would assist any air going into the sewers. On the 21st after six o'clock the barometric action would be to withdraw the gas from the sewers.

Q. Now we have heard of gas going into this manhole through construction joints? A. Yes.

Q. I do not think anybody has given us any idea of what they are. 10
Is it anything of any size? A. I don't know.

Q. What is the construction of the manhole? Is it solid concrete or concrete blocks? A. All I know, it is concrete. There must be construction joints. It is not monolithic.

Q. But they are very small things, aren't they? A. Any I am familiar with or have seen you might describe them as cracks.

Q. And that is the only means of entry that we know of of gas of ours into that manhole? A. I don't know.

Q. MR. WOODS: I think there was evidence of the manhole top— 20
between the manhole top and the manhole?

MR. SMITH: The only evidence I recollect is the evidence of Mr. Haddow who said that the gas could get into the manhole through the construction joints. That is the only evidence given by anybody suggesting the ingress into the manhole.

THE COURT: I do not remember the construction joints.

MR. SMITH: That is all I do remember. I may be using the wrong word. I think "construction joint" was the only term that was used as a method of ingress of gas.

Q. Well, be that as it may. You have heard in the evidence in the 30
very late stages of the fire, that is after the walls had fallen down, evidence given by two witnesses of a pile of bricks burning in the back part of the first floor, that is the unexcavated portion, the back end of the Motor Car Supply Company's building? A. Yes, that was my interpretation of the evidence.

Q. And I think one of them placed it as two feet from the wall and another as ten feet? A. Yes.

Q. And I have more or less assumed they were talking about the same thing. Rightly or wrongly, that is what I had in my mind. And do you also know that just at that point there was a sewer entry to that 40
building? A. No, I don't know that.

Q. Your investigation has not carried you that far? A. This is behind the Motor Car Supply Company?

Q. Yes, at the back end of the Motor Car Supply Company. I remember Mr. Templeman said he saw it about ten feet inside and spoke to Mr. Spencer and said: "Your gas would heat all hell," or something?

A. I knew there was a sewer. I never paid any particular attention to where it came into the building. I do not know.

Q. I was wondering whether your investigation carried you that far? A. No, I do not know where it was.

Q. Granted that at that late stage it had got natural gas into the sewer and the connection had been either melted or broken at that place it might probably account for the continuation of this fire of which these men were speaking? A. It might. The sewer entry came up near that pile of bricks.

Q. That is my information. A. It might be that gas could come up that opening.

Q. Do you remember the hot bricks we had there? A. Yes.

Q. You had not taken that into consideration in forming your opinion? A. No.

Q. MR. WOODS: May I interject my memory of that matter? I am again subject to correction. It is this, that spot Mr. Smith is speaking of is a spot underneath in the rear of the Motor Car Supply Building in that part of the building that is over the unexcavated material.

MR. SMITH: No doubt about that.

MR. WOODS: And I think it was Tom Templeman spoke of seeing just inside the wall a gas flame such as he described. It was to Mr. Spencer. It is in the unexcavated portion.

Q. MR. SMITH: You did not misunderstand me? A. No, in the Motor Car Supply premises I knew it was in an unexcavated place.

Q. There is no doubt we have sewer connections that are not all in our basement in this country? A. I don't know.

Q. What I mean is, we will take a vent from an ordinary toilet and your soil pipe rises to the highest pitched room you have in your place? A. Yes.

Q. And it goes to the top floor of the Macdonald Hotel? A. Yes.

Q. And if we had a sewer emptying something into the Macdonald Hotel and we had destroyed one of the toilets on the sixth floor gases could escape into that sixth floor? A. Yes.

Q. And this opening at the top of the Corona Hotel it does not affect the fact of there being a sewer connection there, does it? A. No, not one bit.

Q. Do you know where the Loveseth Filling Station is in that neighborhood? A. Yes.

Q. There is one that occupies a fair amount of ground? A. Yes.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 43

Edward
Herbert
Boomer
Cross-Ex-
amination
continued.

Q. I think there is one at the corner of 106th Street? A. Yes, Mr. Smith.

Q. And that is a gasoline filling station? A. Yes.

Q. And it is connected to the sewer which goes down behind the Corona Hotel? A. Yes.

Q. And this trench is from 106th Street to 107th Street? A. I don't know about that.

Q. Well our plans will show that so we do not need to discuss it. And if there were and if we know that in other cities very extensive explosions have been made by gases escaping into sewers— A. Yes, I 10
have read of them.

Q. And you have read recently of tremendous fires in London, England, from sewers? A. I have a memory of that occurrence.

Q. So these things are not myths, they do take place, not in Edmonton of course but they do take place elsewhere? A. Yes.

Q. And three or four years ago in Chicago they had streets blow up through sewer explosions? A. Yes.

Q. And by gasoline being in sewers we have explosions and fires, not in Edmonton of course. A. I have heard that theory put forward to account for sewer explosions in other places. 20

Q. Perhaps those other places have not any natural gas. A. I don't know as to that.

Q. Did you make any examination at the time of the fire with respect to the examination of the sewage in that lane or in the manhole? A. The only recollection I have of that is that March 5th when I had the gas samples taken out of the sewer on 107th Street. I went down in the manhole, not to the bottom, the city employee did the sampling for me, but I went down where I could watch him and I was struck by the absence of odors in the sewer, which was the only noticeable thing I can remember about that. That was the only time I was in 30
the sewers.

Q. You never lived in Winnipeg in the winter time? A. No, sir.

Q. There is a tremendous odor in sewers there? A. Well that might be.

Q. What I have in mind. I suppose you can quite conceive if there were explosions in these sewers from some cause other than natural gas I suppose you could quite contemplate an explosion in that manhole would cause a breach of our pipe? I am asking you if it is not possible for an explosion in the sewer to cause a breach in our twelve inch main? A. I do not think so. 40

Q. You are familiar with that bridge across the river that goes right down behind the Macdonald Hotel? A. What is called the Low Level Bridge?

Q. Yes. A. Yes.

Q. And you know this company's twelve inch line crosses that bridge? A. I will take your word for it.

Q. And we also cross the other bridge over the river. Perhaps you will take my word for that? A. Yes.

Q. And I suppose that you having given evidence with respect to temperatures and barometric pressures will agree with me that the changes in the pipe by way of contraction and expansion will be more violent where those pipes are exposed to air than they will under ground? A. I would say they would occur more rapidly.

10 Q. What I mean is this, that the atmospheric temperature is sub-
ject to much more abrupt changes than ground temperatures? A. Yes,
I think so, Mr. Smith.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 43
Edward
Herbert
Boomer
Cross-Ex-
amination
continued.

RE-EXAMINATION BY MR. WOODS.

Q. With regard to Exhibit 51. That has to do with this, what we have referred to is the platform at the top of the basement steps? A. Yes.

Q. And Mr. Smith examined you as to the condition in which you found it after the fire. Do you remember? A. Yes.

20 Q. And can you assist me in this way. Did you when you saw that
construction after the fire notice that any of these stringers had been
actually burned out? A. Yes, the most westerly stringer had been re-
duced to a charred stub. It was practically completely gone. It is not
visible in the photograph. Well it may be visible at the very back of that
platform in the right hand corner—the stub that we noticed of the
remains of the most westerly stringer.

Q. And is that about the position in which the gas conduit entered that wall of the hotel? A. That is above the position—slightly to the west—an inch or two to the west of the hole through which the pipe came.

30 Q. Now my memory of the evidence given with regard to the fires
that were under that landing is this, there was a fire found there, there
was water put on it and it was put out. Later on it was observed there
again and again put out; and I think District Chief Hargrove said they
found it not possible to put it out in the sense of keeping it out, but
that it was a point at which there was a great deal of attention given to
it; a good deal of water put on to it, and there was a good deal of
fighting it at that part of the fire early in the fire before the men had
to get out of the basement. Now would the condition in which you saw
that platform in the basement after the fire be consistent with the fire
coming in through that hole where the conduit pipe is—not the conduit
40 pipe but the gas service pipe—and a good deal of gas coming in there,
being lit, and the gas fire underneath that construction extinguished and
lighting again and extinguished? Would the condition in which you

Re-Exam-
ination

Q. There was nothing else I could ask you just in connection with found the platform bear out that supposition? A. That was my impression at the time I first observed the platform.

that. Is it still your supposition? A. Yes.

Q. You said in answer to my friend, speaking of that area that I have been referring to, that it was an area where there would not be a large amount of gas coming in comparable with the total amount that came in. Did you wish by that answer to in any way qualify the evidence you gave me in chief as to the likelihood of that opening that was shown on some of the photographs where the gas appliances came into the hotel conducting gas through it which was lit and accounting for this gas fire underneath that construction and underneath the kitchen floor and up through the walls? 10

MR. SMITH: I am objecting to the questions. It seems to me we here have a witness who is quite capable of expressing what he means and has done so very well indeed. My friend examined with respect to this and I cross-examined and the question of whether or not he intends to qualify is a question for your Lordship alone and I submit it is not in any sense proper re-examination particularly of a witness of the very fine type Mr. Boomer is. 20

MR. WOODS: I submit it is, but if your Lordship does not consider it is I am willing to drop the question.

THE COURT: I am willing to have the question answered.

MR. SMITH: You will note my objection, my Lord?

MR. WOODS: You understand my question? A. Not quite.

THE COURT: I was just wondering if that would be the witness's answer.

THE WITNESS: You wish to know if I had anything further to add to what I told you before or did I wish to qualify what I told you before? 30

MR. WOODS: No. I am referring to the answer that my friend succeeded in getting from you with a great deal of difficulty as to whether in that area there was a large amount of gas coming out, and your answer that I took down at the time was that there was not a large amount of gas coming out compared with the total amount that came into the building. Have you anything to say in regard to that answer to him, having regard to your original evidence to me on that subject, or not? Did you mean the same thing? A. I meant the same thing. I may not have realized what was being asked for. But certainly the majority of the gas was coming in elsewhere than underneath that platform. Compared to the rest of the gas there was a fraction, one-fifth, one-sixth or one-seventh of the total. It was an appreciable amount. 40

RE-CROSS-EXAMINATION BY MR. SMITH.

MR. SMITH: May I ask Dr. Boomer something I have forgotten?

Q. I was asking about gasoline seepage into sewers in the City of Edmonton. I wonder if you know whether or not the Chief of Police has been circularizing gasoline stations the city complaining of this sort of thing? A. Recently?

Q. Yes, 25th September, 1933, is the last one I know of. Did you know of an occasion quite recently? A. Well several years ago I know that sort of warning had been issued.

10 Q. I mean the chief of the fire department. The chief of the fire department has been endeavoring to get users of gasoline at the stations and elsewhere not to put this liquid into sewers? A. Yes, that is a sensible thing.

Q. THE COURT: I thought that last evening, looking at a stick of wood in a coal and wood fire in a grate at home that I saw at the end of it a bluish and yellow flame. I thought also that the last match I lit before coming into the Court room, that the flame was partially blue, from the match. The reason I asked, apart from a mere matter of interest, I was wondering how far the color of the flame which was
20 emphasized so much by some of the witnesses has any probative effect? A. I never paid any attention to the colors of the flames because I know they can be anything from a complete yellow to a complete blue, depending on conditions.

Q. Would the gas flame I saw last night on the wood that I thought was yellow, come from the flame itself? A. It would be gases generated from the heat of the wood. All flames are like that.

Q. One is not surprised that even a fireman might put too much weight upon the color of the flame? A. My Lord, it is because the gas flame familiar to most people is a blue flame, which is really the Bunsen
30 flame from the well-regulated burner.

No. 44.

Evidence of Ibrahim F. Morrison.

IBRAHIM F. MORRISON, being called as a witness on behalf of the plaintiffs and having been duly sworn was examined by Mr. Woods and testified:

Q. What position do you occupy in the University of Alberta? A. I am Professor of Applied Mechanics at the University of Alberta.

Q. And what is your specialty? What generally speaking is your

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 43

Edward
Herbert
Boomer
Re-Cross-
Examina-
tion.

No. 44
Ibrahim F.
Morrison
Examina-
tion.

specialty. You are investigating. A. Well I teach a number of courses in the Civil Engineering Department chiefly connected with structural engineering and also with materials.

Q. And am I right in giving that you are in your opinion capable of giving expert and opinion testimony with regard to materials generally? A. Yes, sir.

MR. SMITH: I have no hesitation in admitting that with respect to Professor Morrison.

MR. WOODS: Do I need to go on and qualify him?

MR. SMITH: As far as I am concerned you do not need any qualification. I am quite glad to admit it.

MR. WOODS: I want to identify certain plans, one of which is already in. This is a plan which you made, Exhibit 41. And I will have occasion to refer to it later on. And there is another one here that is very similar to a plan of the City Engineer's that is in but which perhaps you will verify for me before I proceed. That is your plan? A. Yes, that is my plan.

Plan showing hotel site and details of intersection 107th Street and lane south of Jasper Avenue, marked Exhibit 56.

Q. This Exhibit 56 shows in one part much the same thing that the City Engineer's big plan does only on a smaller scale and right above that is the general layout of the hotel and the surrounding buildings and the lane and Jasper Avenue with these same constructions as shown down here marked with relation generally to the building. Then there is just below that a special little picture of manhole "A" of the weir chamber of the fifteen inch overflow sewer into manhole "B", and the other constructions at the corner of 107th Street and the lane. Some of these pictures are clearer a good deal than the ones already in. There is another cross-section of that in another piece here and that gives a picture of it looking from the south of section "BB" and similarly another cross-section of it just below. I would say looking from the north—is that north? A. Yes, "BB" is there. 20 30

Q. I will change my question to say that these two cross sections of the manhole and of the constructions are taken from the point on the other plan which is next door to it and we may have occasion to refer to that?

MR. SMITH: By the other plan you mean Exhibit 41?

MR. WOODS: No, the other plan on this same point. Now there is another plan that I want you to identify made by you of the basement of the hotel with certain numbers in circles on it showing the places where you took certain photographs? A. Yes, sir, that is my plan. 40

Q. And it is a plan of the basement of the hotel made by you from all the available information you could get on the subject? A. Yes, sir.

Q. Showing the different rooms and otherwise? A. Yes, sir.

Q. It is an elaboration of the plan, the sketch plan that was put in as Exhibit 4? A. Yes, sir.

*In the
Supreme
Court of
Alberta*

—
Plaintiffs'
Evidence

—
No. 44

Ibrahim F.
Morrison
Examina-
tion.

continued.

Plan of hotel basement marked Exhibit 57.

Q. And from time to time during the examination both of Mr. Haddow and Dr. Boomer there were certain photographs put in, some of which you took yourself, some of which you got from the City. I
10 think it would be convenient here although it is somewhat disjointed to put in here at this stage and explain these other photographs that are not already in so that we won't omit any of them. Will you explain what this No. 3 photograph is taken for, where it is and what it discloses? A. No. 3 photograph is a photograph of a portion of the south wall of the basement of the hotel. The photograph is taken looking approximately southeast. It shows the coke supply chute and also a chute not in use at the time. That is a disused chute.

Q. Now that photograph, No. 3, I take to be a continuation eastward of this No. 2 which is Exhibit 36? A. Yes, sir.

20 Q. Roughly speaking, of the same wall? A. Yes, it is a continuation eastward of the same wall.

Q. You get an idea of it there? A. Yes, these points here—it overlaps like that, it shows the wall from the southwest corner of the basement of the hotel to the elevator shaft or the east wall.

Q. And there is a place—I have a note, it shows where the radiator pipe went up through the rear floor? A. Well it is about half way between the coke chute and the dis-used chute.

Q. The radiator pipe went up through the floor here? A. Yes, sir.

30 Q. And the annotations you have put on there are all correct? A. Yes.

Q. The chute not in use and the coke supply chute, the electric conduits, the coal chute, the rear entry door, the top of the stairs, the water supply pipe and the gas supply pipe? A. Yes.

Photograph, continuation eastward of Exhibit 36, showing coal chute, marked Exhibit 58.

Q. Now No. 5 of your general plan Exhibit 57—and these numbers on your Exhibit 57 in circles are the numbers identifying these photographs with the little black numbers on the top right hand corner? A. Yes.

40 Q. And you took these photographs at the places in the basement? A. Yes, those circles with the numbers inside of them show as closely as I can the position of the camera and also the direction in which the

camera was pointing, and those numbers in the circles correspond to the small numbers in ink on the upper right hand corner of each photograph.

Q. No. 5 shows what? A. No. 5 shows the basement wall on the west side of the hotel and near the northwest corner.

Q. What was it taken for? A. Well it was taken to show the character of that particular wall and to show in particular, damage done to it by fire.

Q. And what would you say as to whether the wall at that point shows any spawling of the bricks? A. The photograph shows that there is no spawling of the brick work around this portion of the wall. I might point out that this wall had a plaster covering and that the plaster has been broken away. I have no means of knowing whether it was broken away during the fire or subsequent to it. Anyway, some portion of the wall still plastered is in very good condition. 10

Photograph of part of west wall of hotel marked Exhibit 59.

Q. And the next one I have here that is not already in is your No. 9. When was that taken? A. I took that photograph myself. I cannot give you the exact date on which it was taken; it was, however, very soon after the fire, that is, as soon as I was asked to make an investigation. It was the first photograph that I took. It has been taken looking towards the south or the remains of the south wall of the hotel which was standing above the basement at that particular time before that south wall was taken down, simply to show the general condition of the south wall, the first time I came there to make an investigation. 20

Q. And that first time was not very long after the fire. You were asked to investigate this at my request? A. Yes, sir.

Photograph of south wall taken at distance, marked Exhibit 60.

Q. Just explain this No. 11. A. I secured photograph No. 11 from the City Claims Agent. I understand it was taken by him looking vertically down the disused chute and was taken for the purpose of showing that at least at the time the photograph was taken there was a crack between the walls of that chute and the south basement wall of the hotel. Photograph No. 12 shows the same thing from a slightly different angle. 30

Q. Mr. SMITH: Have you any idea when Mr. Gosling took these pictures? A. I do not know the date that he took those pictures.

**Photographs looking down coal chutes showing walls,
marked Exhibits 61 and 62.**

Q. These two pictures are taken looking down into the chute?
A. Yes, very nearly vertically down—not quite.

Q. And the next one I have not got is No. 18, and that was taken on the 24th of May, after the south wall had been torn down, and it was taken to show the porous character of the backfill? A. It was taken to show that, and also taken to show the walls of the disused coal chute.

Q. And what are the walls of the disused coal chute? A. The walls of the disused coal chute were constructed of brick.

Q. That is the place where 11 and 12 were taken? A. The photograph also shows that this brick work was not bonded to the south wall of the basement.

10 Q. And it was not bonded at the time of the fire? A. When the disused coal chute was constructed, there was no attempt to bond or interlock the brick of the coal chute into the basement wall of the hotel. There was no evidence of metal ties to tie that wall to the south basement wall of the hotel.

Q. And it also shows there were no footings to that wall? A. Yes, it shows no footings to that wall which formed the disused coal chute.

Q. And I am connecting that up with 11 and 12. According to Mr. Gosling, the place he has marked there, the south wall of the basement and the crack here on Exhibit No. 62, that would be a crack between the 20 south wall of the basement and these two walls of the disused coal chute? A. Yes sir, those photographs 12 and 11.

Q. Or Exhibits 61 and 62? A. Exhibits 61 and 62 show that crack.

Photograph of south wall showing chutes, marked Exhibit 63.

Q. And No. 18, which is Exhibit 63—the continuation of that is the one you are now looking at, No. 19? A. No. 19 is just to the west of photograph No. 18 or Exhibit 63. That is to say, they go together.

Q. They go together in a panorama? A. Yes.

Q. And this is the same telegraph pole? A. Yes.

Q. And that shows the backfill under the whole of the basement? 30 A. That shows the character of the backfill. It shows the coal chute and the character of the pointing between the coal chute and the south wall and it also shows the concrete coal chute and the character of the pointing on the west side, and it also shows the position of the metal electric conduits which came or which covered the power and lighting wires that went into the hotel.

Q. When you spoke of the character of the pointing between those two apertures and the basement wall, what does it show as to their crack?

A. Well it shows that these surfaces which were then exposed as shown in this photograph, shows there had been no attempt to tie these walls 40 forming the coal chutes on to the wall other than placing them so there would be a contact.

Q. And what effect would that have in the case of settlement? A. If there was any settlement of these chutes it might result in a small crack between the chutes and the wall of the basement.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Examina-
tion.

continued.

Q. And I notice in this Exhibit No. 19 you have a note marked "six feet". What is that for? A. On photograph No. 19 I have shown a dimension of six feet from the pavement down to a point which, when I examined the wall, seemed to indicate that it was about the lowest that the fire had reached. That was from my actual examination of the wall.

Photograph continuation of Exhibit 63 westward, marked Exhibit 64.

Q. There is an exhibit in here, No. 33, at some stage. It was put in I think in Mr. Haddow's examination, which shows the wooden box culvert when it was exposed back of the hotel. Do you see? A. Yes.

Q. And I am directing your attention to the vertical crack between the two sections of the wooden box culvert at this point. If your Lordship will look at it, that crack between those two pieces of the wooden box culvert. Whatever would happen in the way of shrinkage or otherwise to that wooden culvert up to the time the photograph was taken—would that crack be extended or affected particularly or would that be the condition in which it was at the time of the fire? A. There was very little shrinkage of wood in the direction of the ground. There might be some shrinkage across the ground to open up these cracks which have been shown.

Q. But these bottom ones? A. Would change very little, whether the wood was wet or dried out.

Q. And while this crack at the bottom, the horizontal crack—that might be bigger on account of the drying out of the wood? A. Yes, and there is no appreciable change.

Q. And you know the position where that vertical crack is? A. Yes, this is the telegraph pole.

Q. And you know the evidence as to where Christie says he came in and over the coke bin he thinks he heard a hissing sound?

MR. SMITH: He was towards the elevator, he said.

MR. WOODS: He was towards the elevator door and when he was next the coke bin which has a roof on it he heard a hissing sound and put a match up there to see what it was.

MR. SMITH: With respect, I submit that is not his evidence.

MR. WOODS: Well, that is my memory of it.

MR. SMITH: He mentioned the statement about ten feet from the garbage.

MR. WOODS: He might be ten feet westward from the garbage thing. But the point is, it was above the place where the coke chute was. There are two rooms of coal that went right up to the ceiling and the east one was where they had the coke and that had a top on it.

THE COURT: For the moment I won't put my memory up against either of you.

MR. WOODS: That is my memory, and it was above that he looked for this strange hissing sound, the sound which he heard. Now assume that I am approximately correct, where would that crack be as compared with where Christie would be if he was looking for—if he was in that position and putting a match up in the neighborhood of above the coke bin? A. Well, that crack is approximately opposite where Mr. Christie is supposed to have stood, at least where he told me he stood—approximately opposite. Of course, he may have been one or two feet one way or the other from it, but approximately opposite it.

Q. Now I want to avoid as much as possible any repetition of the evidence given by Dr. Boomer or Mr. Haddow, and I am making it as short as I can, having a regard to that. You did examine the walls and the debris after the fire, did you? A. Yes, sir.

Q. And we have had Dr. Boomer. He was with you some of the time, at all events? A. Yes.

Q. And some of the photographs he put in and that he referred to particularly as showing where the fire was, were taken by you and his evidence with regard to them is correct, is it? A. He was very often there with me when the photographs were taken.

Q. And would you corroborate what Dr. Boomer has said?

MR. SMITH: I do submit the question should not be put in that form. Dr. Boomer was in this stand half a day or more and I speak as much for Dr. Morrison as for myself, and I submit he should not be asked "do you agree with what Dr. Boomer has said."

THE COURT: I take it that the answer yes or no to that question would or would not say whether he confirmed the cross-examination as well as the direct examination. The value of the evidence would be what you expect it to be if you put that question alone. Was that general question intended to relate to—it refers to whether there was a channel through which the gas from the break in the wall in the twelve inch pipe might have gone, and the opinion of these witnesses that it was that gas that Christie ignited—is that as far as that general question goes?

MR. WOODS: Yes, and to verify the same apertures that are shown. I do not want to ask this witness all over again as to whether he saw this aperture and the other.

THE COURT: It may be convenient for me, Mr. Smith, to say to that, subject to what evidence you may give, that seems to be fully proven. I have not heard the evidence the other way of course at all.

MR. SMITH: That there was a channel through which the gas might have come?

*In the
Supreme
Court of
Alberta*

—
Plaintiffs'
Evidence

—
No. 44
Ibrahim F.
Morrison
Examina-
tion.

continued.

THE COURT: Yes, and I am inclined to think it was natural gas from this break that probably caused the fire.

MR. SMITH: I would not be a bit surprised if that is true.

THE COURT: In other words, unless it is to be contradicted very seriously by the expert evidence that may be called by the defence, I am inclined to think that a lot of this evidence that has been given—I am not giving it offensively—has been perhaps painting the lily.

MR. WOODS: In view of what your Lordship says and in view of the frankness with which my friend has proceeded, I am not going to take this witness over the same ground with regard to these photographs, 10 and the charring of structures in the places they were charred, and the places where the gas could come through the wall, and the spawling of the bricks and all that. I am going to let it rest on Dr. Boomer's testimony. It may shorten this up a great deal.

THE COURT: Mind you, I will have no definite opinion until I have heard all the evidence.

MR. WOODS: Quite right, my Lord. If there is any real doubt I may be permitted to recall Professor Morrison.

THE COURT: Yes, and Mr. Smith, I may say, perhaps, that is an arrangement that might have been made before now. 20

MR. SMITH: I am not receding one moment from the position usually taken by a solicitor in a defensive position, that the plaintiff must proceed the best he can to prove his case. I may, by Professor Morrison in cross-examination, contradict the evidence already in.

THE COURT: At the moment, I take it Mr. Woods is leaving it to you in cross-examination to assist yourself.

MR. WOODS: I am coming to the matter of this break in the pipeline, which is a different subject altogether.

Q. We have it in evidence that a break in that twelve inch intermediate pressure main was discovered between one and two o'clock on 30 the day following the fire and on your plan, Exhibit 56, the position of that break is shown with a legend "approximate location of fracture of intermediate pressure gas main." A. Yes, sir.

Q. And how far below the surface of the pavement was the pipe at that point? A. Approximately two and a half feet.

Q. Now we have it that there were pits open, one east and one west and one in the centre. Now the first place that you saw the gas main exposed was at the centre pit, I believe? A. The first place I saw the gas main exposed was at the centre pit on March 4th, 1932.

Q. And at that time what covered the broken joint? A. At that time 40 the joint was covered by a split Dresser coupling.

Q. And I believe that by an arrangement between yourself and your colleague Mr. Cameron, who was advising the defendants and who have been working together very adequately on this case, that there was a measurement taken by the gas company of the amount of gas that was coming out of that leak at that time. The split Dresser coupling was taken off? A. No it was not removed. There was a pipe coming out of the split Dresser couplings which had a valve on it which should be opened—a meter for the purpose of measuring gas was attached to a pipe leading from that valve and a measurement was made on March 4th of the amount of gas escaping from that valve. Of course all the gas coming through the crack in the pipe must have passed through that valve.

Q. What crack? A. Well, the welded joint was cracked. That was the purpose of putting the Dresser coupling at that point. All the gas coming through the crack in the weld must have passed out through that small valve and into the meter where it was measured.

Q. And what was the measurement? A. The measurement on that date was approximately one hundred and fifty cubic feet per minute.

Q. And would you like to say anything about your opinion as to whether the fracture on March 4th corresponded to the fracture on February 21st or was there any appreciable difference in it? A. I think the fracture on this date may have been slightly larger than it was on the 21st of February. It is my understanding that there was some slight settlement of the pipe that had gone on between February 21st and March 4th. This slight settlement might increase the fracture. It is impossible to say how much.

Q. And would you be of the opinion that the increase in the fracture was an appreciable difference in the amount of gas coming out on the 21st of February to the 4th of March, to make any difference in the conclusions Dr. Boomer came to? A. It might be possible to admit a larger flow. It is impossible to say how much larger.

Q. That is the closest you can give in the matter? A. Yes.

Q. And perhaps I might say, that these gentlemen on both sides connected with the University staff have been working together and it has been a great deal of advantage to us as litigants and to my friends as litigants that we have them in that way capable of giving their services, both on my friend's side and on our side?

THE COURT: You, having made that remark, it leads me to make this. I have been hoping that we would not have a recurrence of what happened in Brody and C.N.R. with regard to Professors from the same University.

MR. WOODS: I do not think there is any likelihood. If we did not have Professor Boomer and Professor Morrison working on these cases common to both of us we would not have them in the Court.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Examina-
tion.

continued.

THE COURT: Yes. And it may become necessary if occasion arises to recede from certain things I said with regard to the situation that then arose.

MR. WOODS: I think we were very fortunate.

THE COURT: I think counsel and the learned gentlemen from the University understand what I mean without my making my meaning clearer.

MR. WOODS: Now on the 13th of June that pipe across 107th Street was laid bare for inspection? A. Yes, sir.

Q. And also the wooden conduit? A. The wooden duct was also exposed, the side of the wooden duct was exposed. 10

Q. And levels were taken of a twelve inch pipe at that time by the City Engineer? A. Yes, sir.

Q. And the split dresser coupling was removed when? A. The date that I have was June 15th.

THE COURT: Am I right in my understanding that the split dresser coupling was a temporary repair?

MR. WOODS: Yes. This was in the winter and the load on the gas main in the winter was very heavy and actual repairs were very wisely delayed until the load became less in the summer and a split dresser coupling was put in in the meantime. 20

Q. You had an inspection of that pipe before it was removed? A. Yes, sir.

Q. And you carefully examined it along with Mr. Cameron and with Mr. Haddow, I believe, did you? A. I would not say I examined it along with Mr. Cameron, because I did not carry out my examination with him. I did with Mr. Haddow. I think Mr. Cameron was present when I carried out my examination but I did not talk with him about it.

Q. Will you be good enough to tell us what your examination of that pipe in place showed at that time? A. Well the twelve inch intermediate pressure pipe had split approximately six inches at the point of fracture, which was I should say, half way between the two Dresser couplings, the one being on the west side of 107th Street and the other being on the east side of 107th Street. That makes the point of fracture approximately at the centre of 107th Street. 30

Q. The two Dresser couplings were about how far apart? A. I have not the exact measurement, but I should say they were seventy-six feet.

Q. And what else was revealed by the examination of that pipe in places? A. The detailed examination showed that the pipe had been placed on filled material. This filled material had a maximum depth of roughly seven and a half inches near the centre of 107th Street. The fill varied towards the west and towards the east from that point, being less in depth as you went west and went east from that point. 40

Q. And what was the next thing that you observed about that pipe in place? A. I examined the soil and noted that the soil below the pipe was a sandy clay, that it was quite wet or moist near the centre of 107th Street and wet also from that point towards the east. From the centre of 107th Street towards the west it was more sandy and a bit drier. There is one point here also that I should mention. We had as an exhibit a wooden roller. I presume it was a roller or a piece of wood that was found underneath the twelve inch pipe.

10 Q. That is Exhibit 26? A. Yes. This wooden roller was put into that trench at the time of construction of the twelve inch pipe line.

Q. How do you so understand? A. I understand that it was used to get the pipe into the tunnel underneath the pavement.

Q. You are familiar with the pipeline construction, of course? A. I have never been on a pipe construction job. I will say that.

20 Q. But it has been suggested here that is what it was used for? A. I think it is quite reasonable that that is what one would expect. It has been sawed off intentionally and it was found lying at right angles, roughly, to the direction of the pipe—that it was a roller or support used when the pipe was placed in the tunnel. The point I wish to make in connection with this is that this piece of wood is in a very good state of preservation especially as compared with the wooden conduit box that runs alongside the pipe. The inference from the good state of preservation of this piece of wood is that the ground upon which it was lying was or had a good moisture content, that is sufficient to cover this piece of wood with a film of water which prevented it decaying. I saw that because I think it is important to know that this was wet ground at this point.

30 Q. And what was the next thing you observed in looking at that pipe and the wooden box culvert? A. I noticed that the wooden conduit box as it has been called was in a state of decay. In fact I broke open the box at places in order to examine its condition.

Q. And was it wet or dry? A. The wood of the box was wet at the time I examined it.

40 Q. And what did the box contain apart from the contents? A. I noticed at the side of 107th Street that the box contained a certain amount of silt inside the box. That would indicate that at some time prior to my examination the box had contained running water which had been muddy and the water had run down and deposited silt inside the box extending from the east side of 107th Street towards the centre. I did not make an examination to find how far this silt went. I did not want to rip up the whole box from the east side of 107th Street to the centre. The natural drainage is from the east side towards 107th Street.

Q. And do you remember whether the summer of 1931 was unusually wet or unusually dry?

MR. SMITH: It is something which can be found out if it is of any

*In the
Supreme
Court of
Alberta*

—
Plaintiffs'
Evidence

—
No. 44
Ibrahim F.
Morrison
Examina-
tion.

continued.

importance and have it given exactly—a statement with regard to weather conditions during the whole summer. If the amount of precipitation is of any importance let us get it accurately.

MR. WOODS: I am sure the witness knows whether the summer was unusually wet or not. If he does remember the summer of 1931 was unusually wet I think, with deference to my friend, he is entitled to say so.

THE COURT: Oh I will hear it but the probative force of it might not be as good as the effect of the proper evidence.

MR. WOODS: Do you remember it? A. My recollection is that 10 the latter part of the summer of 1931 was what we call a wet season. I have not any records to show it but my general remembrance is it was fairly wet.

Q. And what is the next thing you observed in connection with that layout you then saw open for the first time? A. The trench opened at that time exposed not only the twelve inch intermediate pressure main, but also the ten inch low pressure main. I noticed that the low pressure main which runs parallel to and just a little to the south of the other had not settled anywhere near to the same degree that the twelve inch main had settled. Naturally, I examined this matter carefully and found out 20 that the ten inch main near the centre of 107th Street was resting on top of the old sheeting, piling or trench laying that had been used during the construction of manhole "A" and since it was resting directly on top of this sheeting piling it was quite evident that no further settlement could take place unless the wood went down, which it had not.

Q. And you noticed something about the trenches where the construction of the 1907-8 sanitary sewer was? A. Well the excavations at that time showed the outline of the old open cut that had been made for the construction of those sewers. That is, I could see where the replaced soil came across the virgin soil at that place. 30

Q. And the old filled in trenches were visible? A. Yes they were visible.

Q. And you have that location shown on No. 3 of yours? A. Yes.

Q. And it is also shown in the model Mr. Haddow put in but you might just as well point it out? A. This was the one trench for this pipe or sewer running this way. This shows the trench getting through that way. I could see the sides of this old trench where the new ground or the fill on top of the sewer pipe was made. This here, was like that and I could see the sides of that. That is wider because the trench is cut diagonally across there and the trench was a certain width across but it looks 40 wider on the section than if you had cut across diagonally.

THE COURT: That is Exhibit 41? A. Yes.

Q. MR. WOODS: At the date when the pipe was taken up, was that the 15th of June? A. I have the date as the 15th June the split dresser was removed.

*In the
Supreme
Court of
Alberta*

Q. Was that the same date the pipe—A. Yes, they removed the split dresser coupling and took up the pipe on the same day. I have another date, on the 18th of June, when the old pipe was raised and replaced by a new pipe. I do not recall whether the split dresser was taken off—I thought it was taken off first to let us have a look at it and then put on and then the pipe was raised several days later.

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Examina-
tion.

10 Q. Now the lower half of the circumference of the welded joint on the day that you had a look at it, how much did it cover of the lower half? A. Well when I first saw the crack I should say that it covered most of the lower half of the circumference of the pipe.

continued.

Q. And how wide was the opening? A. Well the opening as near as one could estimate without being able to measure very accurately was about one-sixteenth of an inch.

Q. That is the exhibit that is already in but which you and Mr. Cameron have arranged to have taken away today to have a piece taken out? A. Well that was part of it.

20 Q. To get an idea of the width of the opening you could get it fairly well by looking at that other exhibit. That is where you can see how big the crack is? A. Well this is the part that had actually separated, the separation at the bottom here of course that was decreasing as you went up.

Q. And we cannot tell now because that is taken apart? A. No we cannot really tell now.

Q. On the eighteenth the old pipe was raised and replaced by a new pipe. Was that carefully done? A. Well after the gas had been shut off and the dresser coupling removed the old pipe was carefully raised
30 until the fracture had closed. I believe a piece of paper was put in and tried from time to time and as soon as it had gripped the paper it was considered that the fracture had closed and the amount of raising of the pipe to close the fracture was approximately six and one-half inches.

Q. Now on the seventh of July the City Engineer, as he has told us, had the concrete wall of the weir chamber and manhole "A" cut away for the purposes of examination. Now will you take that and explain what exactly you saw there on the seventh of July and on the eighth of July and who was present? A. Well on the seventh I went to manhole "A" (Referring to Exhibit 41), in company with Mr. Haddow and also with
40 Professor Cameron and we went into the manhole and then in turn went into the weir chamber. The weir chamber was large enough I think to hold only one or possibly two at a time. I think we went in one at a time and looked into the hole which had been made through the weir chamber wall above the fifteen inch tile overflow sewer. That hole is indicated on Exhibit 41 at the end of the weir chamber. In looking through

that hole one could see the roof of the tunnel which had been made for the purpose of constructing the tile sewer. The backfilling which had been placed in that tunnel had settled slightly and left an opening between the roof and that material. The opening would be, perhaps one should describe it as crescent shape. I did not take any very exact measurements because one would have to reach in at full arm's length and perhaps a bit further than that in order to reach the end of it. It was what one would naturally expect under those circumstances. A thing in which I was particularly interested was that the roof of the tunnel was still intact and showed no signs that I could discover of settlement of the material above the tunnel. That was the thing in which I was particularly interested. 10

Q. You were making this examination at the request of the solicitor for the plaintiffs or all these examinations and in order to make a report of them? A. When I carried out my report I was interested, as I still am, in trying to find out the real truth of the whole matter.

Q. Now I am a little bit hazy there in connection with the hole. Mr. Haddow described it in answer to Mr. Smith as though the length was vertical. Was it that way? A. According to my observations it was longer perhaps about that wide and perhaps about that high, a sort of semi-crescent shaped opening. 20

Q. When you speak of long how do you mean? A. Well in the direction of the fifteen inch overflow sewer. I call that the length looking away from you. The width was at right angles to that, and the height was perhaps something of that order. I did not take any measurements of it.

Q. Mr. Haddow has described it, roughly speaking, as of the dimensions of Exhibit 17, and could you say one way or the other as to whether your observation of it corresponded with that? A. Well roughly of the same order. 30

Q. But as I gather from what you say instead of Exhibit 17—

MR. SMITH: I think Mr. Haddow said there was one thing he wished to emphasize, and he mentioned this hole.

MR. WOODS: Your evidence is that that is the way it rested—the long part of it was the horizontal parallel or in the same direction as the fifteen inch tile sewer? A. Yes, sir.

Q. That is the seventh. And what was the next? Is that the only thing you discovered? A. That is inside the chamber. On the next day I went to the manhole again and went inside and observed another opening through the concrete wall of the manhole made above the weir chamber. 40

Q. Point that out to his Lordship. A. On Exhibit 41 there is shown a hole through the concrete wall of the manhole through which I looked on the second day. Looking through that hole I could see the brown

earth, a slight excavation was made beyond the hole to examine the earth. I could see the brown earth, that is the original clay soil there. So far as I could discover there were no cracks or any signs of sliding or sloping in that earth and also looking up as well as we could and filling up between the old sheet piling and the manhole there seemed to be a cavity between the sheeting and the concrete manhole which would indicate of course that this was filled material in here. Whether there had been any indication of filling it solidly or not I could not say. It was constructed a great many years ago. All I observed was there was a cavity
10 in there.

Q. Mr. Haddow has mentioned that, too? A. I believe he has.

Q. Would that cavity, dealing with it first, have any bearing upon the question of the settlement of this twelve inch gas main? A. In my opinion it would not have any bearing on the settlement of that gas main because first the cavity was between the old sheet piling and the concrete wall of the manhole and secondly the extent, that is the width of the cavity was not very great. Perhaps it might have been that wide this way (indicating).

Q. How much wide? A. Well say fifteen inches horizontally—
20 across. The settlement of the twelve inch intermediate main took place throughout a whole length of pipe. That was not confined to one short length of pipe but throughout a long length of pipe. My own opinion is that that played no part in a settlement as all of the twelve inch gas main—

Q. And what would you say as to the possibility of the other cavity you have described above the area at the side of the weir chamber having anything to do with the settlement of the twelve inch gas main? A. The cavity first referred to on my first inspection the cavity seen through the opening of the weir chamber, well in my opinion simply went to show
30 that the roof of the tunnel, that is the tunnel put in for the construction of the fifteen inch overflow sewer was still intact, that it had not dropped into the tunnel and the very presence of that arched roof would indicate to me that there had been no disturbance of the original brown clay soil above that. Furthermore, the place where the cavity was seen was, shall I say, five feet away from the centre line of the pipe. It was not directly below it but was to one side of the pipe.

Q. Unless I have omitted something that is in your notes that you have to say about that matter of the examinations that you have made of these points and of these places at the manhole I am going on to the question of the construction of the pipeline? A. At that time I confirmed
40 one of my previous observations, that there was a space between the cast iron frame which holds the manhole cover and the concrete below it—I had observed that space before but on this date, the second date, I confirmed my observations by taking time to examine that space.

Q. And how much of a space was there? A. Well a space perhaps

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Examina-
tion.

continued.

of a quarter of an inch or three-eighths of an inch, somewhere on that order.

Q. And can you show it on this model here? A. Yes, sir.

Q. Is it between this manhole cover—A. This is the manhole cover frame and this is the manhole cover. This is concrete, the manhole itself. There was a slight space between the top of the concrete and the under side.

Q. Now we have it stated in evidence that that portion of the twelve inch intermediate pressure line that went under the pavement at 107th Street was constructed in 1923 by digging a tunnel under the pavement and having the string of four pipes which already were welded together in the trench or on the side of the trench outside the pavement pulled through that tunnel. We have it in evidence that there were three holes made in the pavement for the purpose, one on the east side of 107th Street, one on the centre of 107th Street and one on the west side. We have not got, unfortunately, the dimensions of those holes. Mr. Smith was to give me some of them. 10

MR. SMITH: I gave them all to Mr. Haddow yesterday at noon.

MR. WOODS: Anyway, that is a closed book to us. We cannot tell how big the holes were but we do know that traffic did — there was enough of width between the centre hole and the west hole for traffic to go up and down the street. Now the connections, as we have it, made up in evidence, made at the east and west sides were made by dresser couplings. And how many welds would there be in the string of pipe between the dresser couplings? A. There were four pieces of pipe. That would make three welds, one at the centre and one approximately twenty feet each way. I do not think the pipes were quite twenty feet long. 20

Q. Those welded joints are shown on the City Engineer's plan that is in and also on your own plan? A. Yes, sir. I have shown the position on Exhibit 41. 30

Q. And, as we have already had it, the centre weld is the one that broke. Now from what you saw could you say whether the bottom of the pipe rested on the bottom of the tunnel? A. No, sir, the bottom of the pipe when I saw it was resting on what has been called filled material. That is material which was placed after or replaced, may I say, after the trench or tunnel had been constructed. The pipe was resting on that filled material.

Q. And Mr. Ruff, the city sewer foreman, described his view of that trench. Perhaps I got a wrong impression of it or perhaps I got a right one. But I want to see what you say about it because you saw it. As I understood him he said something to the effect—I took it to mean that one part of that pipe—the welded pipe, the stringer pipe that we mentioned, rested on the virgin ground and the other half of it rested on filled material; that the north part of it rested upon ground that was not 40

filled material and the south part rested on filled material. Was that your observation? A. It was not my observation. As I remember it when the old pipe was removed the city engineer started approximately at the centre of 107th Street and by digging the bottom of the trench one could see the contact between the original bottom of the trench and the filled material. I think Mr. Haddow and also Mr. Cameron at that time went along as the digging progressed and at various points along placing a level rod for the purpose of taking levels at that contact, and in that way the profile of the bottom of the old trench was secured. Now I did not
 10 notice whether the north half of the pipe, if I may call it that, rested in the virgin soil and the south half on the filled material. My own impression is that it rested all on filled material.

Q. I suppose this plan of yours you have taken this profile of the filling on the twelve inch pipe from the city engineer's plan? A. That data was secured on that day, was plotted on a co-ordinate paper for the purpose of seeing the profile of the bottom of the old tunnel or trench and it was from that plotted profile that I plotted this particular sheet. Of course the scale here has been made to an inch scale. The one I received from the city engineer had an exaggerated scale as such profiles
 20 usually have.

Q. And was it your own observation that the intermediate pressure main was found west of the fracture and near to one of the west welded joints to be resting on a brick? A. There was a brick at one place and I understand this roller or stick at another place as shown on that plan.

Q. The brick is over here to the west side of the street and the stick to the east side of the street? A. Yes.

THE COURT: They were not in place when you saw them? A. It strikes me I saw that roller and brick if I remember correctly. I was there when the pipe was removed and looked at the trench all the way along.

30 MR. WOODS: Now take that method of construction as you saw it on the ground when the pipe was raised, what would you say as to the probability of settlement of the backfilling taking place? A. When one takes into account all the circumstances, that is to say the fact that the backfilling is a sandy clay, that it has been in a position where it was kept moist by natural drainage, that it was difficult by that method of construction to backfill underneath the pipe in a very solid fashion, I should say that it was quite reasonable to expect that the pipe would settle at points along the line not necessarily only between the dresser couplings but perhaps both east and west somewhat from the dresser
 40 couplings.

Q. Now can you give me a description of how that settlement takes place from year to year? A. Yes. I think the settlement took place in this way; each year in the early part of the winter the ground would start to freeze from the top downwards. It is well known that in clay soils the

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44

Ibrahim F.
Morrison
Examina-
tion.

continued.

water content in those soils freezes and that ice crystals start to form. Those ice crystals continue to grow and exert an expansive pressure. The water coming to form the ice comes up from the clay from below. The freezing takes place from the top down. That exerts an expansive pressure on the under side of the pavement at the top of the pipe, the soil below the pipe has not yet frozen and is still soft. The pressure tends to force the pipe down into that soft soil below. The soil itself would undergo a certain amount of compacting and also a certain amount lateral displacement as any plastic material will be displaced laterally. An illustration of that sort of action is given when one places an iron bulb in a barrel of asphalt. The bulb sinks slowly and it may take a year or more to get to the bottom and it does so by a displacement of the plastic material up around the ball and eventually it sinks down. Now that process in my mind did not take place all in one year. That is, it is a process which has been going on ever since the pipeline was constructed and would be dependent each year on the amount of moisture available in the soil at the beginning of the freezing period. That is to say perhaps the first year it might have settled half an inch, the second year three-quarters of an inch and perhaps next year it had not settled at all. We do not know how that took place. And I observed also that over the pipe the pavement has also settled in an elevation running parallel and immediately above the twelve inch and ten inch mains. That shows that instead of the pavement being heaved up as it does in some cases that this pavement had actually been pressed down during summer probably by vehicles passing over it. That would naturally fall in on top of the soil so that there is from year to year this wedging action that is going on. 10

Q. And what happens in the spring? A. The ground is going to thaw out. It would thaw at the top down and there would be no tendency to lift the pipe. Of course as the freezing progressed during the winter naturally the ground completely around the pipe would be freezing and at that time there would be no further sinking of the pipe for that particular winter and even as the ground froze and down below the pipe there would be some tendency to press it back but the frozen ground above it would keep it from going back very much. 20

Q. And each succeeding year saw this pipe sinking deeper and deeper in the backfill? A. That is the picture that I have of it. 30

Q. What would be the effect on the sinking of the pipe as you saw it sink, that is to say not altogether but sinking in the centre six and one-half inches lower than the two sides. A. The important point in connection with the sinking of the pipe is that the pipe did not sink uniformly throughout the length between the Dresser couplings. It may have sunk down some at the Dresser couplings but during that sinking process it sunk further near the centre of 107th Street than at the Dresser couplings. The pipe was originally approximately straight, that is to make the welded joints you had to bring the pipes together and they would be reasonably straight. And when the pipe was put in the trench perhaps 40

there was a slight downward bend in it during construction. That would immediately at that stage of the game throw a certain amount of stress in the pipe and it would stay there and as the pipe sunk down more and more, that is relative to the Dresser couplings the pipe got into a bent or curved shape and when it did get into that bent or curved shape it became stressed.

Q. Now I am coming to this matter of the weld in the joint which is the particular subject upon which I wish to ask you to be very specific and give all the information as clearly as you can to us unscientific men.
 10 Will you describe the welded joint with reference to the exhibits before you as you see it? A. The type of joint is a butt welded joint. There has been no attempt made—at least so far as I can discover—to make a “V” in the metal from the outside in order to permit the easy penetration of the weld metal through to the bottom of the joints. I understand that this is not the practice with pipe one-quarter of an inch thick. I shall remark on that later also.

Q. But presently you do not understand it is practical to have an outside “V?” A. I understand it is not the practice at the present time.
 20 I would not expect to find the evidence of a “V” there. I did not examine that particular joint. We are waiting for the piece to be cut out from the other pipe. The examination of the fracture shows that the weld metal has not been worked through to the bottom of the joint, that is to say the inside surface of the pipe. The pipe itself at the bottom of the joint has not been fused together. The pipes appear to have been placed quite close together when the welding was carried out. I might remark that the point in that is it is usually customary to leave a slight separation between the ends of the pipe in order that the pipe metal may be fused together right to the bottom of the joint. That is to say, there has not been good penetration of either the pipe metal—the fused pipe metal
 30 or the metal from the welding rod itself in that joint. In examining the fracture I found that there are gas cavities — a contentious point of course; I find under the microscope that there are oxide inclusions and I find that the fracture has taken place by a tearing process of the metal, that is to say that the fracture does not show a ductile type of fracture. That does not mean that the metal is not ductile. It does not show the ductile type of fracture.

Q. Just explain that—the ductile fracture. A. There is a reason for that which is perhaps rather elaborate but I think perhaps I should go into detail and explain the reason for that. May I say first that the
 40 fracture is of the faceted type.

Q. It shows the facets? A. It has a scintillating appearance characteristic of what is called the brittle type of fracture. Please do not misunderstand me. I do not say the metal was brittle. The cohesion of the end metal at the end of the little fissure by the lack of penetration was overcome by the stresses which have been imposed upon it. This frac-

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Examina-
tion.

continued.

ture is characteristic of that which took place in a metal at points of high stress concentration. I shall have to go into that. I am sorry to do it but I see no other way out of it. Now in my mind the most important thing in connection with this whole fracture is the fact that the lack of penetration of the metal into the joint has left this small fissure. I shall utilize photographs and also other exhibits to show that. First if I may mention the effect of such a fissure on the strength of a piece of metal regardless of what the metal may be—the effect of a fissure of that sort is to raise the average stress by several fold. That can be done and it can be shown that is not only theoretical but experimental as well and has been shown experimentally by different methods. 10

Q. What do you mean by a fissure—so that the Court will understand the fissure in question. A. I think probably if we refer to the exhibits I can make that plain.

Q. Now this is not an exhibit of this particular weld. A. No.

Q. It is a picture under the microscope of the weld at one side of it.

A. One of the other of the three welds.

Q. We will have to wait to get a picture of the thing we are getting today before we can be quite certain that we will find a fissure there?

A. I do not have to wait. I know there is a fissure there, absolutely. 20

Q. Assume for the purposes of your explanation. Explain what a fissure is by reference to that. A. These two pictures have been taken for the purpose of showing the tiny fissure which goes up. This is the inside of the pipe and this is the weld metal and one piece of pipe this way and the other that way. The weld metal has not penetrated between the two pieces of pipe (indicating). That is what I mean by the fissure extending from the inside of the pipe up to the base of the weld metal. The weld metal comes in there and can be seen very clearly in this photograph in here. Those exhibits are 46 and 45.

Q. Do you place any great stress in connection with the evidence you are going to give upon these gas cavities? A. I do not look on the gas cavities as of comparable importance as compared with the fissure that I have described. 30

Q. I know my friend is in the habit of saying “we will wipe out the gas cavities.” You are not wiping them out but you are not giving the paramount importance to it. A. No. Certainly a gas cavity will weaken a welded joint but it depends on the size of the cavity and its location as to how much its weakening effect would be, but the fissure I am talking about is of far more importance than any gas cavities that may have been found, and there were quite a few even in this weld. 40

THE COURT: Are Exhibits 45 and 46 microscopic? A. Yes. The pipe is approximately one-quarter of an inch thick. That has been magnified approximately three times I should think.

Q. You have a little pipe there that you polished up, have you?

A. Yes. That is another piece of the same welded joint. That photograph is not of that particular one but of one cut right alongside of it.

Q. But that is the size of the thing and this is the magnified size?

A. Yes, quite.

Piece of one of the welded joints shown in Exhibit 46, marked Exhibit 65.

MR. WOODS: That is what a fissure is and if it is convenient to Your Lordship I would like to begin tomorrow on what the point of stress concentration is.

Actual pieces of weld shown on Exhibit 46, marked Exhibit 66.

10 **Actual piece of weld shown on Exhibit 45, marked Exhibit 67.**

Q. These are properly called cross-sections of the weld, are they?

A. Yes.

At 4:30 Court adjourns till 10:00 a.m.
Thursday, January 25th, 1934.

Thursday, January 25th, 1934,
Court resumes at 10:00 a.m.

MR. WOODS: Before you proceed with your explanation I am putting in here as Exhibit 68 a piece that has been cut out of the weld by arrangement, out of Exhibit 43 at the place shown, in order to illustrate the point in your evidence that you are now at. That is as Your Lordship remembers, the piece of pipe and the weld in question and the pieces taken from the upper side of the weld, the break having been at the lower side as shown by the other two exhibits that are in.

Piece of steel taken out of Exhibit 43, marked Exhibit 68.

Q. This has been polished on one side and etched on the other side, the etching being a process whereby acid is put on to show the contact of the weld? A. It is polished first and then etched with a suitable material to show the line of contact between the two.

30 Q. That exhibit; what does that exhibit disclose as compared with the other two welds that are already in, one each side of the two pipes that are welded? A. Well that exhibit discloses this fact that there is a lack of penetration of the metal through to the inside of the pipe. The other welds one to the east and one to the west, show lack of penetration and now that we have this one it also shows lack of penetration through to the inside of the pipe, that is penetration of the weld metal and lack of fusion of the two pipes together along the welded joint. Of course we have taken only one small section but it has been taken out arbitrarily, and these fractures here also indicate a lack of

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44

Ibrahim F.
Morrison
Examina-
tion.

continued.

penetration. So that I think it is quite fair to realize that around the entire circumference of the pipe there has been a lack of penetration.

Q. You were going on this morning to explain to the Court as shortly as possible what you meant by stress concentration having regard to the fissure that is shown in each of these three exhibits filed? A. If I may offer as brief an explanation as possible. First may I say something about just what I am going to call the average stress in any piece of material? If any piece of material is pulled then the pull divided by the cross sectional area of the piece, the pull divided by that area gave me the average stress. Now if I had a piece in which there is a fissure of an inch or a notch or any hole or any other discontinuity then the average stress is still obtained by dividing the pull by the cross sectional area. But the actual stress in the vicinity of the notch is raised by a considerable amount due to the presence of the notch. Now the effect of the notch or fissure is dependent on the sharpness of the end and there is a very simple formula that has been worked out theoretically and tested experimentally in several ways to prove its correctness, that the stress at the bottom of the notch is raised by a considerable amount. That is to say one arrives at a multiplying factor so that in order to get the stress at the bottom of the notch one has to multiply by this factor the average stress. That has been called by certain investigators a stress raiser. Now the amount by which that stress can be raised has been investigated. 10

Q. When you speak of stress throughout do I understand that means the amount of pull or the amount of force that will be necessary to overcome the cohesive strength? A. That will be the breaking stress. The stress, no matter how large or small the pull may be, is always figured by dividing the pull of the area and the stress at the bottom of the notch is figured by taking that average stress and multiplying it by the factor, depending on the sharpness of the notch at the bottom of it. Now that factor might be anything, well depending on the radius of curvature, anything from one up to a fairly large number, depending on the sharpness. The experimental values that have been investigated seem to include figures from three to six. So that in the case of a piece of material being pulled although the average stress may not be sufficient to overcome the cohesive strength of the material the presence of the notch may raise in the vicinity of the end of the notch the stress high enough to overcome the cohesive strength of the material and the fracture starts. Once a fracture starts, the fracture itself is a fissure or a notch and it is a self propagating phenomenon which will not stop until the average stress at the point at the end of the notch has decreased so much that even if you do multiply it by the factor it will not overcome the strength. Of course it may stop if you come to a hole and not continue beyond that hole. Now that is what is meant by the term "stress concentration." I have endeavored to strip the entire description of technical phraseology and endeavored to make it simple. I have no hesitation in saying that 30 40

it will take two hours to two hours and a half to expound the complete theory and practice and experimental work and so on that has been done on that particular subject and this is no place for that, to my mind.

Q. Now is that fracture characteristic of what takes place in a metal at a place where there is high stress concentration? A. The type of fracture is the type that takes place in a metal when the fracture has been initiated by the presence of a fissure and by the presence of stress concentration. There are a great many examples of that and this is one characteristic fracture. May I go into that in detail?

10 Q. Yes. A. The fracture as I described yesterday, has a scintillating appearance or used to have, but this is very nearly two years old now and it has become dark and corroded somewhat. The section that we have here of the actual fracture shows that all along there was no fusion at the inside of the pipe and therefore that there was a fissure, as I have called it, all the way around.

Q. You are referring to Exhibit 42? A. Yes, sir. This is the bottom of the pipe here (indicating). The stress at the bottom of the pipe due to the bending of the pipe and to some other factors was the average stress—it was greatest at this point. The average tension stress was
20 greatest at this point. At some point on the inside of the pipe and at the base of the fissure the fracture started. I have a photograph, one of the exhibits, which shows an arrow pointing to the outside. It is put on there to show in general where the fracture started. The fracture started on the inside and once started progressed outwards and upwards around the pipe.

Q. You are referring to the photograph Exhibit 44? A. Forty-four. The inside of the pipe is here and the outside here. I have put an arrow to show in general where the fracture took place. There is no evidence in examining that fracture as to whether the fracture took place all at
30 once or not. All that I can say about that is this, that there was not a tiny fracture on the outside of the pipe, on the outside of the weld for some time prior to the actually breaking through. In the first place I think I have explained that the fracture took place at the inside first and worked to the outside. If it had broken on the outside for some time before the final break which caused the leak to take place then we would find evidence of that on the fractured surface, and there is no such evidence there. So that in my own opinion in regard to how that fracture took place it was that it suddenly took place at the bottom running immediately through the weld and somewhat on each side. It is impos-
40 sible to say how far upon each side. I do not think anybody knows that. But it was quite sufficient to produce a good sized leak.

Q. But the opening took place suddenly? A. Yes. I mean it was not a slow creeping fracture which might have gone on for weeks or months before it finally broke through.

Q. But the crack that produced that sudden break may have been a

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44

Ibrahim F.
Morrison
Examina-
tion.

continued.

crack that proceeded in stages for quite a long period of time? A. The fissure was there. Of course the fissure in itself is almost practically a crack in a sense. It is a potential sort of thing. Now my opinion of that is this that as the stress gradually increased at the bottom of the pipe due to the bending and other causes it got to the pipe where the cohesion of the metal was overcome and once that was overcome the fracture immediately went through to the outside. At least there is no evidence that I can find that it did anything else. If it had started as a tiny crack on the outside of the weld there would be very characteristic evidence that it had done so. There is not any on this particular fracture. 10

Q. Could you from anything you have seen give an opinion as to how many inches the crack would cover as a minimum in your opinion at the time it finally broke open? A. It is impossible to estimate how long that crack would have been after the first run took place. My opinion is that it starts and runs a little way and it would go so far as necessary to relieve the stress and probably no further. Now it could be only a very very crude estimate—I should judge four or five inches might be a reasonable distance for that crack to run first but there is no way of calculating.

Q. You mean the actual fracture? A. Yes, the actual crack right through. 20

Q. Four or five inches is as far as you can estimate what would be in your opinion the first actual part broken? A. I think that would be a reasonably conservative estimate.

Q. And would that amount be sufficient assuming it was that long, would that be sufficient to allow of the outflow of a considerable amount of gas at thirty-five to forty pounds pressure? A. At thirty-five or forty pounds pressure I think a considerable flow of gas would come out of a fracture of that sort.

Q. Now will you explain what in your opinion is the cause of that fracture? A. I have put the cause of the fracture into two groups. I have called those groups the important and sufficient causes and then the unimportant and unlikely causes. In the first group there is the stress due to the bending of the pipe, the tension stress at the bottom of the welded joint due to the bending of the pipe. We know that the pipe was originally approximately straight. I know when I saw it taken up it had become slightly curved and the sag at the middle was approximately six and one-half inches. That in a quantitative way indicates that there was tension at the bottom of the pipe. It does not make any difference how long the curve took to get there. It is the final effect that really is of importance. That is one cause. Another cause is the contraction or resistance against contraction to shrinkage due to temperature of the pipe itself. 30 40

Q. Would you be good enough to explain that to me so that I will understand it in connection with the possibility of that stress or of that resistance to that contraction being in any way taken up by the Dresser

couplings on each side of the pipe where we have them? A. Well the pipe was of the order of eighty feet in length between the Dresser couplings. The Dresser couplings themselves have to be tight enough to prevent the escape of gas and they offer a certain amount of frictional resistance at the end of the pipe. On the other hand the pipe during the winter was lying in frozen soil and there would be a holding power of that soil all the way along the pipe from each Dresser coupling towards the end. Now I have made no attempt to estimate how much that holding power is. There could be no question but what it is there. As to its amount I think it is quite impossible to say with any degree of exactness how much it would be.

Q. Is that on account of lack of data? A. On account of lack of accurate data. One would have to know the temperature of the pipe at the time it was laid and he would have to know perhaps a certain amount of history of the rise and fall of that temperature over eight years while it was in the ground. He would also have to know something about the conditions of moisture throughout that entire eight years and also how much the holding power of the soil was and the holding power of the Dresser coupling. There is so much data lacking that I make no attempt to put in whatever any quantitative estimate. It is there, however, qualitatively. Now those two causes of stress in the pipe are of primary importance. By themselves I do not think that they would be sufficient to cause the fracture but when multiplied by the stress concentration factor which is also difficult to estimate because we do not know how sharp the fissure was at the bottom, then there has been sufficient cause for the fracture to occur. There are other causes such as—

Q. Before you go into those other causes which I understand, or am I right, are they unimportant? A. There are no others of primary importance, in my mind.

Q. Here are the two pipes together and the weld is in this middle joint? A. Yes, sir.

Q. As it lays in the ground the middle part where the two ends meet on the inside (illustrating with folded plans) there is a drop of six and one-half inches from the perpendicular and that produces a certain amount of stress in the bottom of the pipe. On each outside end of those two pipes there is a Dresser coupling, as I understand it? A. Yes, sir.

Q. The temperature factor as explained by you I understand to be the holding power of the ground on that pipe and as opposed to the tendency of the pipe itself to shrink in the clay? A. Yes, sir, in length.

Q. So that that holding power of the ground to some extent—correct me if I am wrong—counteracts the shrinkage of the pipe. Am I right? A. Yes, sir.

Q. But when the two elements of the shrinkage of the pipes due to temperature and the stress concentration made by sinking of the pipe as stated— A. No. I must correct you there. The sinking of the pipe caused

at the bottom, at the welded joint, a tension stress. The tendency for contraction of the pipe resistance by the Dresser couplings and the soil all along each way along caused also at the bottom a tension stress. These two stresses must first be added together. Let me call this the average stress. Having added those together you multiply by the stress concentration factor caused by the fissure due to lack of penetration of the metal through the weld into the inside of the pipe.

Q. And then having multiplied that average stress concentration in that way you arrive—it is in fact a greater figure than the figure that would be necessary to overcome the cohesive strength of the material? 10

A. Yes.

Q. And then a break happens? A. That is exactly the explanation that I offer.

Q. Now let me get straight on this. I gather that you speak of the contraction of the pipe as one of those factors. Suppose there were a Dresser coupling in the middle, what amount of play would be given? A. If it had been a Dresser coupling in the middle expansion and contraction to a limited extent would be provided for and that expansion and contraction would relieve the stresses not only due to temperature contraction but also due to the sinking down of the pipe, because a certain amount of rotation can take place in the Dresser coupling. That is to say, it would induce the element of flexibility in the pipe at the centre. 20

Q. But is there any importance or significance so far as taking up that contraction feature of the matter in the fact that there are Dresser couplings on the outside ends? A. The Dresser couplings on the outside ends are supposed to provide expansion and contraction but the holding power of the soil all the way along from each Dresser coupling to the centre where the fracture took place is an accumulated effect. That is to say the holding power at the end might be a thousand pounds, just as a matter of illustration. Two feet from the end two thousand pounds, three feet from the end it will be three thousand and so on until you get to the middle and you have a possible pull of forty thousand, if you have gone forty feet. Now that is merely an illustration; it is not an estimate of course. 30

Q. I have a picture of what you have put in as simple technical language as you can of how this pipe came to break and how that break might have been to a limited extent provided for by the presence of a Dresser coupling in the middle and I have a picture of a pipe contracting in the temperature. That contraction of the pipe in the temperature by reason of the temperature of course would mean that at the ends where there are Dresser couplings it could to a limited extent come out without breaking but in the middle where there is no Dresser coupling it would ultimately break, is that your explanation? A. If that had been a piece of plain pipe right straight through at the centre without any weld I do not believe the stress would have been high enough to break the ordinary pipe, but the presence of the welded joint of course with its stress 40

concentration factor has been sufficient to explain the cause of the fracture at that point now. If there were a Dresser coupling there that would permit a tiny amount of movement necessary to relieve the pipe of stresses due to both sinking and temperature contraction.

10 Q. THE COURT: Am I right in this, that I did not understand you to speak of the lack of Dresser couplings at the point of the fracture as one of the important or sufficient causes of the break, except when it was suggested to you? A. I think had the Dresser coupling been there there would have been no fracture of the pipe at that point. If one of the
 10 other welds had sunk by the same amount that this one did it might have fractured, but there would not have been any pulling apart or leak of the pipe at that point had there been a Dresser coupling there.

MR. WOODS: I do not understand the Dresser coupling as being any one of the factors that produced the fracture.

THE COURT: Do I understand that perhaps the most important and sufficient cause in your opinion is the bending of the pipe—do I understand you to mean that bending was caused by subsidence? A. Yes, sir.

Q. So that I can understand it? A. Yes.

20 Q. In other words, without subsidence the main premise of your opinion would be gone? A. If by that, by the term “subsidence” is meant the sinking down of the pipe—yes. Really in so far as the stress is concerned the pipe was originally reasonably straight. Later on I find that the pipe has become curved by a certain amount. The fact that it has changed from a piece approximately straight at least, to a piece curved the way in which we find it is qualitatively indicative of the fact that there is a tension stress at the bottom of that pipe. I make no attempt to estimate quantitatively how much it is. That can be estimated but there is not much point in doing so when you have to add to that the surely unknown stress due to temperature contraction and then you have
 30 to multiply by a factor that is likely around three or a little greater which you cannot be certain of and which you can only judge in a qualitative way.

Q. Could bending downwards be caused by—what? A. The bending of the pipe was a result of the sinking of the pipe into the soil below the pipe.

MR. WOODS: And what was the cause of the sinking of the pipe into the soil below the pipe? A. I think I went into that yesterday.

40 Q. THE COURT: But it could hardly have been, could it, in the manner of the illustration of the heavy ball sinking into asphalt. That illustration struck me perhaps as being hardly appropriate? A. The illustration was mentioned for this reason. The sinking of the pipe took place by going down into the soil beneath it. That soil was partly compressed and partly displaced up around the pipe by plastic flow. An iron

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Examina-
tion.

continued.

ball placed on some asphalt will gradually sink into the asphalt by displacement of plastic flow up around the ball. The illustration was put in simply to illustrate the phenomena of plastic flow of the clay up around the sides of the pipe.

Q. MR. WOODS: You have given what I understand to be the important and sufficient causes as being the two you mentioned—the sinking of the pipe in the first place combined with the contraction due to temperature stresses acting upon the weld as we find it to be. Will you say what you group under the unimportant and unlikely causes? A. The unimportant causes, or among them, first I might mention the fact that in all welded joints there are internal stresses set up due to the process of welding. Here again— 10

Q. While it may be quite true that you explained yesterday about this matter of the pipe bending, I understood his Lordship's question just a few moments ago to really be directed to the inquiry as to why that pipe bent and I would like you if it is convenient for you now to tell again if necessary why in your opinion that pipe did bend down? A. The pipe would tend to sink down in the first place under its own weight. That is one factor. In the second place there is the presence of frost action tending to also force the pipe down into the soil. 20

Q. What sort of soil? A. Into the soil beneath the pipe.

Q. What sort of soil was that? A. The soil beneath the pipe was sandy clay, a plastic type of soil when containing a sufficient amount of moisture.

Q. And we have it yesterday, that it was backfilled? A. It was back-filled under the pipe.

THE COURT: It was because of such memory as I had of his explanation of that that led me to ask the question. You may go over it again if you like.

MR. WOODS: Go on with your explanation of any, of first of all, what you in your own opinion regard as unimportant causes and then we will go to the unlikely causes. A. In each welded joint there are internal stresses set up which may be large or may be small but which cannot be estimated. We know of their presence. They can be removed after the weld is made by proper heating but of course it is not likely that that was done in this case, so that there is the presence of internal stresses. They have been known to be enough to fracture a pipe. In my opinion they were not important enough in this case to be an important contributing factor. They were present but I put them as of minor importance, for this reason, that if they had been more than of minor degree they would not have stood the treatment when the pipe was pulled. They could be very important, but not in this case. Another cause has been the possibility of shock or vibration possibly by the passing of vehicles along the street. When one realizes that this pipe was in frozen ground both above 30 40

and below at the time, the street of course was covered with snow and ice and may have been roughened up somewhat as our streets are at the present time. There is a possibility that shock could cause a fracture. On the other hand, in looking into this, realizing that the pipe is solidly imbedded in the frozen ground, realizing it is two and one-half feet below the surface of the pavement to the top of the pipe and realizing the usual method of spreading the load out as it goes down into the soil, that is to say it is losing its intensity by spreading itself out; the fact that heavy vehicles are not likely to pass up and down 107th Street on Sunday, that the wheel would have to be right over the fracture, which is a very very unlikely thing, it does not seem to me that there is a possible explanation that the pipe could have been fractured by any sudden blow or jar or impact. It certainly could not have been the sole cause because if that sort of thing could happen with any very great frequency it certainly would have happened some time prior to the eight years that had intervened between the construction of the pipe and the actual time of fracture. That is to say, that very factor in itself makes the probability very very small. So I have put that factor into an unlikely cause. As to the vibration from street cars up on Jasper Avenue that is practically imperceptible. During the time while the pipe was exposed although the ground was not frozen I stood in the trench and every time any sort of vehicle passed I put my hand to the side of the trench to see if there was any sort of vibration and when street cars passed along I also endeavored to detect the presence of vibration. In both cases I could not feel very much. Of course that is not reproducing the circumstances that were present at the time of the fracture so that one must not go too much on that sort of evidence. Well those are the unlikely causes. One could go into the weld metal itself as to its character and brittleness and so on. But personally I do not think there is anything there of importance.

30 Q. There has been mention made of gas cavities in pipe metal. In what category would you put those gas cavities or have you not put them in at all? A. In regard to gas cavities they are usually quite round and the radius of curvature is not terribly small as compared with the possible radius of curvature at the end of a fissure. They would tend to act as sources of stress concentration in certain circumstances. I do not consider that they have a weakening effect on the pipe from the point of view of stress concentration. They certainly contribute their small quota by the fact that they are simply holes and places where there is no metal. But they are not of primary importance in this particular case. I shall

40 mention that again when I speak of the tests that were made on the welded joints.

Q. How about slag inclusions? Are they in the same category?
A. They can be of considerable importance, if at the end of the slag inclusion there is a very sharp end because there again you can have stress concentration.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Examina-
tion.

continued.

Q. How about this piece? A. Well in one of the photographs slag inclusions can be observed. I think they probably have acted here as bonds, as stress concentration as well as the bottom of the fissure that I have mentioned. Take Exhibit 45. It is difficult to tell from the photograph whether it is slag or merely cavity.

Q. That is the black stuff? A. That is the black material at the base of the weld metal in Exhibit 45.

Q. Will you have a photograph of the exhibit we put in this morning? A. I did not ask Dr. Cameron to make a photograph. I have no doubt he would do so. 10

Q. Would it be useful for the Court to have one? A. It could be done of course, unless it be that we must have something of the actual weld itself.

Q. Have you any further information on that subject of gas cavities and slag inclusions? A. I have no further remarks of that sort.

MR. SMITH: If my friend wishes that photograph Mr. Cameron will send over and have it taken this morning.

Q. MR. WOODS: We might just as well have the three of them. I think it will be useful.

THE COURT: You are not asking me whether I want it or not. 20

MR. SMITH: No, sir, I am just addressing it to my friend. May I borrow the exhibit?

THE COURT: Certainly. Will the photograph be a microscopic one?

MR. SMITH: The same as the others, they were enlarged three times.

THE WITNESS: Three times or nearly so.

MR. WOODS: Go ahead, doctor. A. One more word may be said in regard to my reason for laying so much importance on the subject of stress concentration. During the last two years I have made a study of the subject of fractures. I have examined well over a hundred records of actual fractures which took place in service. I have examined a number of fractures at first hand. In the majority of those cases I find that stress concentration has been—that is the point of stress concentration has been the place or point from which the fracture started. It is reasonable to conclude therefore that the stress concentration itself is the cause of the start of the fracture. Of course the fracture once started, the crack itself, as I have explained, has a stress concentration at its end and therefore it is very easily propagated. 30

Q. Is that all you have to say on that subject? A. I should take up the tests of the welded joints. 40

Q. Go ahead, sir. A. After the pipe was taken up there were three portions cut off from the line approximately four feet long, and having in each case one of the three welded joints at the centre. Those portions were taken to the University and strips were cut so that the strip would be perhaps two feet long with the welded joint at the centre. Those strips were then prepared by machining along the edge in order to get away from the place where the cutting flame had fused the metal, and were then tested. These tests show that the average breaking strength of the joints was eleven thousand eight hundred and sixty pounds.

10 Q. What does that mean exactly? A. Well that is the test load on the specimen. That is the average test load of two. Well there may have been more than two, but I think the maximum recorded is fourteen thousand two hundred and the minimum nine thousand eight hundred and thirty. There may have been others in between. I am not sure, but there were four. The average is eleven thousand eight hundred and sixty.

Q. At the joints? A. That is at the welded joints. Those broke through the welds. The average strength of two samples of the pipe without the welded joint, in pounds was twenty-two thousand five hundred and fifty. The efficiency of the welded joints put on that basis by dividing the eleven thousand eight hundred and sixty by twenty-two thousand 20 five hundred and fifty and multiplying by one hundred gives fifty-three per cent as the efficiency of the welded joints tested. Now the middle of the welded joint could not be tested for the reasons that there was so much of it fractured and we were very doubtful as to whether the top would give us, that is the top portion, would give us a fair test. So that, in our estimation could not be tested to get a fair result. Of course it would have broken if it had been injured by getting the pipe out of the trench—it would have given a low result.

Q. So the nearest you can come to giving an approximation of what 30 the test of that middle joint is by taking the two joints at each end and finding what percentage of the strength of the unwelded material of the pipe— A. Yes.

Q. And in one case it was fifty-three per cent of the strength of the material? A. Yes.

Q. And in the other case? A. I have computed also the strength of the welds per square inch and I got that to be twenty-nine thousand one hundred pounds per square inch as compared with fifty-six thousand eight hundred pounds per square inch for the unwelded metal and that gives an efficiency of fifty-one per cent for the welded joint. That is 40 simply two methods of making the calculation. In one case I get fifty-three and in the other case I get fifty-one per cent. That includes all of the tests that were made on both of those welded joints. That is the average of all the tests.

Q. And did you have any tests made to show whether that particular material that we are concerned with in this case, those pieces of pipe

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Examina-
tion.

continued.

metal, could be welded at all? A. Yes, two pieces of the pipe metal were cut out in strips and then those strips were cut into at the centre crossways and I took those strips to a concern here in Edmonton and asked to have them welded together. I was present while those welds were being made. In fact I had on colored glasses and watched the welds as they were made. After the welds had been made they were taken back to the University and prepared in the same way as the other test pieces were prepared for tests. During the making of one of the welds—I had two different welders—one welded one pair of pieces and the other the other pair. The first welder appeared to me as being a little more skilful than the second welder. During the process of welding I called the attention of— 10

Q. Well do not say what you said. A. I am sorry.

Q. What was the result of that test as showing the strength?

A. Could I point out that during the process of welding I observed there was a gas cavity included in one of those welds?

Q. Yes, you could point that out but not what you said to the welder. The other I gather you did not see any gas cavity in it? A. In the first weld I observed no gas cavity. In the second I did observe a gas cavity during the welding process. The breaking strength of these two pieces were respectively twenty-one thousand pounds and seventeen thousand one hundred pounds. 20

Q. What efficiency does that give? A. The first test specimen did not break through the weld. The weld was stronger than the pipe metal itself; it broke outside of the weld. I might say that in this case the penetration of the weld metal was good; it went through to the inside of the pipe surface. It did not protrude inside but it went through as far as the inside of the pipe surface. The second specimen broke at seventeen thousand one hundred and broke through the weld metal itself. That gives an efficiency of one hundred per cent in the first case and seventy-nine per cent in the second case. In examining the fracture of the second weld it was quite clear that the fracture originated in the neighborhood at least of the gas cavity that I had observed when the weld was being made. 30

Q. Can you give me what in good practice a good welded joint should be—what efficiency of the pipe material? A. I think a good welded joint should have an efficiency of eighty per cent, possibly up to eighty-five per cent.

Q. What would you say as to an efficiency of a welded joint that has fifty-one or fifty-three per cent of the pipe material? A. I should classify that as being a poor weld. 40

THE COURT: What were these materials that the test was made of? I did not get that.

MR. WOODS: The material—it is in percentages of the very pipe

material itself. You get the relative strength of the weld compared with the breaking strength of this very material that we have here in Exhibit 42 and Exhibit 43. In the one case it is fifty-one to fifty-three per cent and in the case of the welds made at the instance of Professor Morrison by a welding shop in the city, of the same material, it is one hundred per cent in the one case and seventy-nine per cent in the other. That is all this, from the pipe material.

Q. Now what did your examination of the welded joint that broke show? A. You are referring to these Exhibits 42 and 43?

10 Q. Yes. A. Well my examination of that welded joint showed that there had been no penetration of the weld metal through to the inside of the pipe. I have already pointed out that that leaves a fissure, as I have called it, extending up to the base of the weld metal.

Q. Can you say whether the examination of the weld in question showed whether the pipes at the time of the weld had been very close together or had there been a little space left between them at the time of the welding or was that possible for you to tell? A. Well it is very difficult to tell whether there was an appreciable space left between the ends of the pipe. At some points it appears to me as though the ends of
20 the pipe had been brought quite close together. There should of course for good welding be a small space between the ends of the pipe which would permit the welder to work or fuse the material through to the inside of the pipe. I think possibly that may be an explanation as to why the welders or welder on the three joints did not succeed in getting the metal through to the bottom—that they were too close together.

Q. Did you have an examination to show whether there had been any corrosion at the middle weld? A. I examined the welded pipe around the weld and so far as the weld metal itself is concerned I can find
30 no appreciable corrosion on the weld metal.

Q. What would you say as a result of your examination of this weld in question? What opinion would you give—expert opinion as to that joint? A. My opinion in regard to that particular weld which broke is that it was put there primarily to—may I say—“seal” the space between the two ends of the pipes in order to make the joint gas tight. Of course some strength was given to the joints but it was primarily intended for the purpose of sealing the pipe rather than carrying a stress in the pipe as far as leaking gas is concerned. As far as I know there would have been no leaks of gas through this particular weld metal.

Q. Is it a suitable weld for the purpose of carrying the stresses to
40 which that pipe was going to be subjected at the time it was laid in 1923? A. I do not think it was a suitable weld for the purpose of carrying stress.

Q. From your examination of the pipe as it lay in the ground what would you say as to whether at the time that pipe was so laid and in the way it was laid it was clear that it would be called upon to carry

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Examina-
tion.

continued.

certain stresses? A. Well it is very difficult to know how much investigation the engineers, acting for the contractors, had made into our soil and temperature conditions at that time. We have in this country certain soil and temperature conditions which have to be contended with in all engineering work and they are different than in other parts of the world. In fact they are different in different parts of the city and there are evidences of the sinking of foundations of buildings in the city. I am not referring to the mining subsidence or anything of that sort, but in other places entirely away from mines. It seems to me that that is about all that can be said in regard to that question. The conditions were there. I have not any idea what investigations the engineers made. 10

Q. Should they have known that that pipe was going to carry certain stresses, laid as it was in the frost lines and laid on made ground?

A. There is always the possibility a pipe line has to carry stresses if it was sunk down in the way this was. I cannot say whether they should have anticipated the sinking or not.

Q. Now will you come to your conclusions then, Professor Morrison, made as a result of your examination after this fire? That is if you have finished with the matter of the weld. A. Yes, I have finished. 20

Q. You did make the examinations of the locus in quo—of the place after the fire? A. Yes.

Q. And you made a very careful study of the conditions? A. Yes.

Q. What is your opinion as to the origin of the fire? A. My opinion is it was due to the explosion caused by the ignition of natural gas in the basement of the Corona Hotel.

Q. Where was the source of the gas in question? A. The source of the natural gas in question was from a leak in a twelve inch intermediate pressure main of the Northwest Utilities Company at the centre of 107th Street and the lane or the intersection of 107th Street and the lane south of Jasper Avenue. 30

Q. What was that? How did that leak come about? A. The leak was through a fracture of the welded joint at the place I have already mentioned.

Q. How was the string of pipe in which this leak occurred put in the ground? A. I have no first hand information of how that string of pipe was put into the ground, but from what information I could get it is my understanding that the four pieces of pipe were welded together by the three welded joints, put into the trench, I am not sure whether it was to the east or to the west, and then dragged through the tunnel that had been made under the pavement of the street. 40

Q. And where did you find evidences of that pipe having laid—on what kind of material did you find it? A. I found that the pipe was resting on filled material which had been placed under the pipe in the tunnel and in the open cuts of the street during the time of construction.

Q. And what did you find as to the wooden box? A. The wooden box for the return leads of the street railway was in poor condition, that is to say rotting had taken place. The joints were not tight. It was wet when I first saw it. It had apparently acted to carry water from time to time as a sort of trench from the east down towards the centre of 107th Street.

10 Q. What did you find as to the sinking of the pipe? In what way in your opinion did this sinking take place? A. Well the sinking of the pipe was due to the weight of the pipe, to the frost action each year and, of course, the frost action itself is dependent on a natural ground water supply in the clay underneath the pipe. I think I explained yesterday that frost action which is the cause of the heaving of our pavements sometimes—the ice action drawing the water from below was sufficient to exert an expansive pressure. May I add that I observed that the pavement over the pipe had sunk down and was hollowed down to a depth of about three inches I think over the twelve inch and over the ten inch main.

20 Q. Referring now to this welded joint. Was that welded joint in your opinion a reasonably good welded joint when it was put down in 1923, from an engineering standpoint? A. I think the welded joint insofar as it was intended to seal the pipe against the leakage of gas was a good joint, but insofar as its ability to carry stresses is concerned I think that it was an unsuitable joint, I mean from the point of view of being defective, due to the actual making of the weld. That is to say, the welder did not do a good job, so to speak, if the pipe had to carry stress.

Q. And your remark then was to the art of welding in 1923? A. Yes.

30 Q. What would you say as to the placing of this welded joint near a sewer manhole of the city and in the frost line, as to whether special care should or should not have been taken under those circumstances? A. A considerable amount of damage has occurred from time to time by gases getting into sewer systems and into other places. The welded joints in any pipe line, barring defective pipe, are almost certain to be the weakest parts of the line itself. The joint here was placed very close to a manhole. If that pipe line was going to break or leak at all insofar as the welded joints are concerned it would do so at the welded joint rather than through the pipe metal. For that reason I have in my report expressed the opinion that it did not indicate the very best of judgment to put a welded joint near a sewer manhole. It would have
40 been better to keep away from the manhole in case a leak did occur in the weld.

Q. And is that your opinion? A. That is my opinion.

Q. Now referring to the method of construction of the pipe itself by pulling the four pieces of welded pipes through the trench as we

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Examina-
tion.

continued.

have it described in evidence. Would such a method of construction be expected to result in stresses on that pipe such as we know developed through the sinking of the pipe? A. Well the welding of a string of four pieces of pipe together, putting it into the trench, then dragging it through, and realizing that it was resting at definite isolated points, would tend to put stresses all right at that time into the welded joints. How severe those stresses would be it is impossible to say but I have not the slightest doubt but that from the very first day that pipe was placed in the trench there was already some stress on that centre welded joint, because it was dragged in and put on isolated points, and there would be a tendency to bend towards the middle. The bend from the stress was not very much, probably, but it was there nevertheless. 10

Q. And still referring to the time this pipe was put down in 1923 would your opinion be that placed where it was the distance below the pavement that it was, and near a utility such as we know it was, whether good engineering and good construction would have called for that weld at that middle point to be constructed in any other way than it was? A. I think it is a general principle in engineering that when there is a possible source of danger arising from fractures more care is usually taken than when possible consequences are not so great. That is to say, in all kinds of structural designs the factor of safety is usually increased in cases where the result of a fracture or break would cause loss of life and large loss of property. In other cases where the consequences are not so great the factor of safety can be reduced. 20

Q. My question was would you say in your opinion that weld should have been constructed in any different method to what it was, and my next question was going to be in what way? A. I believe that care in making those welds should have been used under the circumstances, where the weld was going to be placed near a manhole, where the danger of escaping gas was great, precaution should be taken in making welds. 30

Q. And would you say that care was not taken as evidenced by the weld itself? A. Well the welder—I do not know whether one welder made all three welds or not but all three welds are defective in exactly the same way and I mean by that that this is no mere accident of just one single weld. There were three welds. Those are the only three welds I have examined in the whole system—all turned out to be defective in exactly the same way. That is apparently that the welder was not skilful enough or did not endeavor to get pipe metal fused to the bottom or to the inside of the pipe. 40

CROSS-EXAMINATION BY MR. SMITH.

Q. I understood you to say that in your opinion you thought the welded joints should be placed at a greater distance from the manhole?

A. I think that in this case it would have been a very simple matter to have had a twenty foot length of pipe so that there was no weld directly opposite the manhole. That is, that the two ends of the twenty foot length would come as far as possible from the manhole. I think that would have been good engineering judgment.

10 Q. But of course if we had done that and the City of Edmonton had come along and built a run-way beside our pipe and it had broken away it would have filled the manhole just the same? A. I have no doubt the gas might well have found its way into the manhole but the ease with which it could get there, and the quantity that might arrive at the manhole would certainly be less, the further away the welded joint was.

Q. Supposing the conduit box never had been there and we had put our weld twenty feet away or on your basis ten feet away, it would be good engineering because you would have a twenty foot length? A. Yes.

Q. Do you think the gas would have gone through the ground into the manhole? A. Gas can travel through ground. It has been known to do so. I can cite two or three instances where I know it has done so.

20 Q. But in this place do you think it would have travelled through the ground? A. I think it could have done so.

Q. So we would not be much better off from a practical standpoint, would we, if we had the joint further away? A. Oh yes.

Q. In what way? A. The distance to travel is greater, the probability of there being fissures and so on in the frozen soil, of course will lead to the manhole, but it would be certainly less. The diffusion of the gas—I am not a gas expert by the way—in various directions, from the leak would take place and therefore there would be less gas going towards and into the manhole from a joint which was remote from it. I am not denying it could go there. It certainly could go there.

30 Q. I am glad you said that because I gather you are of the opinion that if we put gas into the Corona Hotel we would put it there by carrying it along a conduit box which is two hundred feet— A. In my opinion the gas went towards the hotel not only along the box, possibly under the pavement and also along the outside surface of the ten inch main and the twelve inch main.

40 Q. And you can see no difficulty in gas travelling through the earth under the pavement something over two hundred feet from our break to the Corona Hotel but do see difficulty in it going ten feet from the break into the manhole? A. I did not say I saw no difficulty in it going two hundred feet.

Q. But it would be proportionately greater? A. Of course there is the resistance to flow all the way along.

Q. Now going back to your evidence of yesterday, and I wish to question you first about this ditch and I am referring to Exhibit 28 which is Mr. Haddow's plan. And as I understand you you are of the

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Cross-Ex-
amination
continued.

opinion when we put our pipe down we put it down reasonably straight. That was your expression to my friend? A. Of course I have no first-hand information as to whether the pipe was actually straight or not but in order to make the welded joint the pipe had to be brought so that the ends were close to one another and if there had been any appreciable angle between them you would not have the ends close together, and a big space. So it is quite reasonable for me to suppose that the pipe was reasonably straight.

THE COURT: One expression was "approximately straight?" A. Approximately or reasonably. 10

MR. SMITH: You are giving here and my opponents are giving it as your expert opinion that when this pipe was laid it was laid reasonably straight? A. That is as far as I can go.

Q. You agreed with my statement of what your evidence was? A. I have no first hand information of it.

Q. I am speaking of an opinion? A. That is all.

Q. And you do give me that as your opinion? A. That is my opinion based simply on the fact, that in order to weld pipes properly they must have been lined up.

Q. And you give me that opinion after having made as careful an examination of the ground as you could at the time the four welded joints were removed from 107th Street? A. I did not base my opinion on the examination of the ground. My opinion as far as the original straightness of the pipe is concerned is that the welded joints show that the ends of the pipe all around were in quite close proximity to one another, if not in actual contact all around. You could not have that if the pipe were connected off its natural square. 20

Q. Let me put it in this way, that having made an examination of that ground when those four lengths of pipe were removed you saw no reason to change the opinion you have expressed to Mr. Woods and myself? A. Which opinion do you refer to? 30

Q. Your opinion that this pipe was laid reasonably straight. A. I am not passing my opinion that the pipe was originally straight or anything to do with the ground.

Q. I merely said to you and I said it very simply, that having examined the ground and the pipe when the four lengths of pipe were removed you saw nothing there which would alter the opinion you have expressed, namely, that when the pipe was laid it was laid reasonably straight. Now I think you can answer that. A. Not insofar as the ground was concerned. 40

Q. Or the pipe itself or anything you observed in the locus, if I may use that expression? A. No, sir.

Q. So that so far as you are concerned you eliminate any question of a failure to lay to grade as a reason for the ultimate breach in this weld? A. I am not sure that I just understand your question.

Q. I can make it clearer by saying I am eliminating the question of faulty backfilling. What I am saying to you is that you are eliminating any question of a failure to lay to grade as a contributing cause of the breaking of our weld? A. Well as I understand it—I may be wrong in this, but my understanding is that the four pieces of pipe were first welded together. That was on the surface of the ground, I suppose; that they laid down planks or pieces of timber crossways and put the pipe on those pieces of timber. The welders then rolled the pipes into position and brought the welded joints close together. The welds were then made. The pipe was then rolled or lifted—I don't know just how—and placed into the open trench, either on one side of 107th Street or the other. The tunnel under portions of the pavement had been dug out and the bottom of that tunnel was, according to my best information, as given on this Exhibit 28. I did not take elevations. This is the City Engineer's. I saw the City Engineer and Professor Cameron at work taking them and stayed there while they did it. As I understand it that string of pipe as we have called it was then dragged through underneath the pavement. If we are to take Exhibit 28 as showing the profile of the virgin soil in that tunnel or combined tunnel or trench, under the pavement then I do not believe that the shape of the pipe as dragged in, conformed to the shape longitudinally of the bottom of that trench. The pipe after being dragged in, as I understand it, was supported at points. We have a wooden roller here. Somebody has mentioned the fact that there was a brick present under the pipe. Now that shows in my opinion that the pipe did not lie on the bottom of the trench.

Q. What I said to you is this—I do not care whether it was supported on bricks or sticks or anything else—merely as long as it was laid to grade. A. It just depends what you mean by laying to grade.

Q. As indicated by the City Engineer on the plan he gave us telling us to lay it to that grade. It was marked as an Exhibit, I think. There are instructions on Exhibit 37 "N.B. On this lane run to established grade and take away surplus excavation. A. W. HADDOW." If I understood you in giving your reasons for the breaking of our weld they were primarily a sinking of the pipe into the soil at the centre, that is the greater depth being at the centre and the sinking was caused by poor backfilling. Now that is the way I understood you. Am I right about that? A. No, I do not think that I said the sinking was the cause of the poor backfilling—that the poor backfilling was the cause of the sinking. I have no doubt had there been solid or virgin ground underneath the pipe all the way along, that the additional resistance or supporting power of that ground would have gone a long way towards preventing the sinking of that pipe. The cause of the sinking I have placed as due to the weight of the pipe and due to the frost acting above the pipe tends to force it down into the backfilling which was not as solid as the virgin soil at that particular location. That is to say, the

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Cross-Ex-
amination
continued.

part with the backfilling place is simply that it is a soil which has not got the same capacity for supporting the pipe from below. It does not form the cause of the sinking. There are two different things there.

THE COURT: Of course the word "cause" might have different meanings? A. Yes, sir, it might have two different meanings.

Q. I think I understood what you mean now by "cause" in the sense of your previous interjection.

MR. SMITH: What I am trying to get at is very simple. The pipe laid across that street straight irrespective of what it was supported by, would be unobjectionable to you if we could properly support it after? A. Well as I say, in my opinion the pipe was very likely approximately straight when it was put in. Now had it been supported from below by soil of sufficient bearing capacity to prevent a sinking it seems to me it would have been satisfactory. In fact I do not think we would have been here. 10

Q. Supposing as we had first laid it we had supported it with cement, carrying the footings to bedrock, if there is such a thing in Edmonton, it would have been unobjectionable as to its grade? A. I should say that no objection could be raised to making certain that there was a support of sufficient bearing capacity under the pipe to prevent settlement. I think that would have been very good engineering. 20

Q. That is not what I asked you at all. What I am trying to find out is whether or not you attribute as one of the causes of the failure of this pipe, the failure of this defendant to lay that pipe to grade in 1923. Now do you or do you not? A. Well I do not think I could answer that question exactly because I am not denying that the pipe was laid to grade. I have not any doubt that in so far as the grade was concerned the pipe was laid to grade. What I am saying is that it was not laid on a material which had sufficient supporting capacity to prevent it sinking and being forced down into that material. 30

Q. And surely you will answer me with a simple yes or no to this question. If you say you are satisfied that the pipe was laid to grade then you are not introducing a failure to lay to grade as a factor in the failure of this weld, are you? A. I have no means of knowing whether the pipe was laid to grade or not.

Q. Assuming that it was, as you said it was. A. Assuming it was. I think the answer to your question is "yes."

Q. So we come on to the question of the causes of the pipe sinking. I am asking you to look at Exhibit 28 which you have in front of you. Now you will observe that running generally together there are the twelve inch welded line and the ten inch line which I think has not yet been proven but which I want you to assume is a welded line. Did you observe the welds? A. Yes, I understand the ten inch line was also a welded line. 40

Q. You do understand that the ten inch as well as the twelve inch is a welded line? A. Yes.

Q. So across this street you will first look at the wooden conduit box, and I am asking you to observe that from the point you will observe the break? A. Yes.

Q. I am going from left to right. I want you to take a look at the way the ten inch line and the conduit box cross that street and you have already said that there has been a subsidence in the ten inch line? A. I have not mentioned ten inch line.

10 Q. Well tell me if in your judgment there has been a subsidence in the ten inch line? A. I did not measure it and I could not say at all. All I know is there had been no appreciable subsidence near the man-hole where the ten inch line was resting on the sheeting.

Q. Now assuming Mr. Haddow is correct when he said there had been some subsidence in the ten inch line you would also anticipate there had been a similar subsidence in the wooden conduit box, looking at your plan. A. Well I cannot assume there is any subsidence in the wooden conduit box. You cannot tell anything about it because there was no attempt to lay it to grade. The cables go up and down, as they
20 are flexible, and I dare say no attempt was made to lay it to grade, but merely from the point of view of giving a warning to any workmen who might pick there so that they would not strike a pick into the cables. There is no attempt as far as I am aware of any attempt to lay to grade and for that reason since we have no idea where the conduit box was originally we cannot say there was any settlement. It may have gone up for all I know.

Q. That on your part is complete supposition? A. As far as the wooden conduit box is concerned.

Q. Were you here when Mr. Haddow in this Court swore that this
30 wooden conduit box across 107th Street was laid to grade but not to instrumental grade? Did you hear him say that? A. I do not recall that I was here at that particular moment.

Q. According to the City Engineer of this City I want you to accept that the box was laid to grade. A. It is quite possible it was laid approximately to grade. That is instrumental grade—you mean they had taken the trouble to put a level with a competent surveyor there, on the top and to put that box into grade, and that of course would be between points where the grade would eliminate trouble—it should be a straight line—if it were done instrumentally. On the other hand I am
40 not at all certain Mr. Haddow meant that it was done with any very great degree of accuracy, that it was just a general grade, that is the wooden box was not put in intending to put it in two feet below the pavement or that they put it four feet inside, that is he put it in approximately to grade. It might have been three inches too low at one place or two inches too high at another and so on.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Cross-Ex-
amination
continued.

MR. WOODS: And that is my understanding of his evidence, too.

Q. MR. SMITH: If you will take a look at the grade of the wooden conduit box you will agree with me that at the crossing of 107th Street it has followed very closely the grade of our ten inch main. Surely that is apparent? A. This plan of course was drawn up by the City Engineer and I have no doubt but what it is kept accurately but I am familiar with drawing plans myself and I do not believe for a minute that that line showing the bottom of the conduit box has been drawn in with any very great amount of accuracy unless I know in the first place that the City Engineer has taken a series of levels across on that wooden conduit box as well as on the pipe to get accurately the position of that box. My own feeling is that so far as the box is concerned a few isolated points on the box have been taken, and that straight lines have been drawn between those isolated points. The box in my mind between those points is probably somewhat up and down. That is the ordinary way of doing this thing unless careful levels were taken every few feet all along. 10

Q. I am unable to say, and you won't argue with me that this plan was wrong, because I asked the City Engineer if it was right and he said it was. A. I am not assuming it was wrong. 20

Q. Then let us assume it is right. And there is a most peculiar continuity of line and direction between the wooden conduit box and the ten inch line that runs across 107th Street? A. Well they seem to be roughly parallel to one another. I do not think insofar as the laying was concerned that they had any relationship to one another.

Q. Perhaps you will go this far with me, that it is at least a coincidence that we find the conduit box and the ten inch line, that we find following one another so accurately as to elevation? A. Well they follow one another accurately only near the centre of 107th Street.

Q. Well it is apparent on the plan how far they do, isn't it? A. Well near the east property line they are close together and at the west property line they are not close together. 30

Q. And it drops in a distance of about thirty feet until they are running approximately together in a point beyond the brick shown on the plan? A. Yes.

Q. And they are so continued right across the street to the other property line. That is apparent? A. Yes.

Q. The ten inch line is between the twelve inch line and the conduit box. This plan does presume to show the elevations of these things? A. Yes, it does. 40

Q. And you will perhaps further agree with me that if there has been a subsidence in the ten inch line it is a peculiar coincidence that the conduit box has shown a similar subsidence. I mean it is at least a coincidence? A. Yes, if there has been a subsidence in the ten inch line and if there has been a subsidence in the conduit box.

Q. Take it either way. If either the ten inch or the conduit box were laid to grade they have subsided. I would suggest you look. A. It would depend on what grade they were laid to. Laying to grade depends on what they are laid to. It may be a straight line or a broken line. And the grade may be curved, so laying to grade does not mean a straight line.

Q. Now a line on this plan shows a distinct sag in that ten inch main in the crossing of that street. A. Yes.

10 Q. You are not going to suggest that anybody would intentionally lay that ten inch line with a sag in it across that street? A. I have no doubt how they intended to lay it.

Q. As an engineering proposition you would not suggest an engineer would plot a sag on his plan on which that pipe was to be laid going that distance? A. I should not think so. Very likely it was intended to be straight.

Q. So if it was intended to be straight and was laid straight it has in fact sagged? A. Because it is intended to be laid straight does not prove it was.

20 THE COURT: His question was "if it were laid straight." There are certain things that are based on plain facts, whether assumed or otherwise. This question happens to be one based upon a supposititious circumstance or fact. Now let us get on with that. Assuming that the ten inch line were laid straight, it now shows a sag? A. Yes, sir.

Q. And that sag no doubt is a subsidence of that pipe? A. Yes, we might call that a subsidence. I prefer to say it as a sinking of the pipe. Subsidence is rather a broad term.

30 Q. MR. SMITH: I suppose you will go this far with me. When you assumed and gave me your reasons for the twelve inch pipe when laid being reasonably straight you will also go with me on the same reasoning and give me as your opinion that when the ten inch pipe was laid it was also laid reasonably straight? A. I should think it was laid straight. It was a welded pipe—and for the same reason.

Q. So that on the assumption this time that you are correct in your opinion that we laid the ten inch line straight it has in the meantime sunk in the crossing of 107th Street? A. To a certain extent.

Q. And you found that ten inch line resting on some sheeting. Is that the word? A. Well sheeting, piling near the manhole.

40 Q. And you were also aware that those pipes—the ten and the twelve—were laid at different times? A. I understand they were laid at different times.

Q. Separately trenched? A. I believe so.

Q. So if both were originally laid straight, both then have sunk on account of our failure to properly backfill them to hold them up? A. If they were laid at different times.

*In the
Supreme
Court of
Alberta*
—
Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Cross-Ex-
amination
continued.

Q. Assuming that, because that is a fact. A. It does not necessarily mean that the backfilling under the ten inch main was done with the same quality of workmanship as under the twelve inch main. One may have been poorly done and one may have been very well done. They were laid at different times.

Q. But this, though, is true, that if both pipes have sagged in backfilling we not only have a bad backfilling once but we did it twice? That is true, isn't it? A. If both pipes have sunk into the backfilling it would indicate to me that that backfilling was not sufficiently strong to support either of these pipes, taken separately of course, under the circumstances of climatic conditions, soil moisture and various other factors that might well be mentioned. 10

Q. You can give me a simple answer to this question, I am sure. What I suggest is this, admitting, as you have, a sag in both these pipes crossing 107th Street, admitting that in your opinion that when they were first put in they were laid approximately straight or reasonably straight, then we have twice failed to properly backfill a pipe going across that street. There is no doubt about that, is there? A. I do not think I have said anything about whether the backfilling was properly done or improperly done. Did I use a term of that sort? 20

Q. I am suggesting you did. But let us clear that up. In your view did we properly backfill our twelve inch line? A. It is quite evident to me that the backfilling under the twelve inch line was incapable of supporting that twelve inch line. Whether it was done properly or not I think it seems to me that that is indicative of the fact that it was incapable of supporting the pipe, the backfilling was not as well done as it should have been.

Q. Do you want to go so far as to say that having regard to the soil you find in Edmonton under 107th Street it is impossible to backfill a ditch to support this twelve inch pipe? A. I would not say it was impossible. In fact I think probably it could have been done if sufficient care was taken. 30

Q. In fact you will go this far with me, that it is possible with the kind of soil present under that pavement on 107th Street to so backfill our trenches as to hold up our twelve inch line? A. Insofar as the soil itself is concerned I think that it would be possible to sufficiently place or to place that soil under the pipe to a sufficiently packed condition provided there was room to work so that it would support the pipe. Of course in my investigations I have found out that that was rather a wet spot there and that also is a contributing factor in regard to the sinking of the pipe. I may go on to say that I have found other places in this city where there are also such wet spots and a sinking has also occurred not only of pipes but of other things—in these places. 40

Q. I suggest to you there is no doubt at all that you can take those four lengths of pipes, plug up the ends and they will float in water,

won't they? Will you tell me whether or not in your judgment these pipes of ours would float in water, that is if they were plugged? A. Yes, if you take a piece of pipe line and plug up the end so it would not leak I am sure it would float.

Q. And I am showing you a photograph that illustrates the thing very clearly. And I have a booklet that has to do with the construction of this pipe line and you will see a great many feet of it floating in the slough, and the waggon is full of sand bags to put it down? A. Yes.

10 Q. And the way that line would be laid, a trenching machine would go through that slough, making what sort of haphazard ditch it could and then the sand bags would be put on it to put it down? A. Yes.

Q. That would be proper engineering practice? A. Yes.

Picture illustrating laying of pipe, filed as Exhibit 69.

MR. WOODS: The only part my friend wants as an exhibit is the photograph, not the printed matter.

MR. SMITH: That is all.

Q. And there is another picture here, where it is apparent that this line is being laid in earth and water almost of the texture of thick soup? A. Yes.

20 Q. That is true? A. Yes.

Picture illustrating laying of pipe, filed as Exhibit 70.

THE COURT: I suppose something subsides because something sinks. It is not the pipe that subsides? A. Well of course, but the pipe may be exerting a pressure on whatever was below it.

At 12:20 Court adjourns till 2:00 p.m.

At 2:00 p.m. Court resumes.

Q. When we adjourned for lunch we were talking about the sinking of our pipe which is the word I think we agreed upon? A. Yes.

30 Q. I suppose there is no doubt that this pipe or ours at 107th Street has been sunk by the jacking action of the frost and to some extent that is going on on all the lines in this city? A. You mean in connection with the frost action forcing the pipe into the soil below it?

Q. Yes. To some extent that must be going on with all the lines which we have laid in this City. A. Yes. In that particular vicinity where there was a sufficient amount of water to enable that sort of action to go on I think probably it is quite fair to say that all the lines were subjected to roughly the same sort of action. One might get it a bit more than others.

40 Q. To some extent it is going on with respect to all our lines in this City? A. Well wherever you have the clay soils and mixtures of sand

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Cross-Ex-
amination
continued.

and clay you would have that action. The action does not take place where you have sand and furthermore it does not take place where you do not have a sufficient amount of water that can be drawn up from below to give the effect. Of course there has been heaving of pavement throughout the city in various places.

Q. Mr. Haddow tells us that the soil in that locality was similar to the soil of Edmonton generally. I will put it this way, where we have similar soil conditions our pipe lines are being slowly year by year sunk? A. Well I suppose when Mr. Haddow said that the soil was similar to the soil in Edmonton that he meant that in a very, very general sort of way. As a matter of fact going around the city you will find some places where the soil is very, very clayey and other places very sandy and other places in between, where it seems to be a combination and in one particular place you might find a certain soil which is not generally characteristic of the Edmonton soil. But there is a fair variation all the way from sand to a pretty greasy clay. 10

Q. I will put it to you in this way. We are here on McDougall Avenue and here where we are standing at 107th Street it is, generally speaking, a level bench land on this side of the river. The soil conditions are about the same as they are on 107th Street? A. As at where else? 20

Q. Well where we are now the soil conditions are about the same. A. I have not investigated the soil conditions on McDougall Avenue although I did look at the soil on 107th Street. Now the soil conditions can vary in that distance. Now where my house is built is on sand and I am just about a block from where the University is and it is clay.

Q. But that is on the other side of the river? A. Oh yes.

Q. But on the assumption that there are many other places in the City of Edmonton where the soil conditions are similar to what they are on the 107th Street crossing, then that jacking action is going on on all our lines and joints in these portions of the city? A. Providing all the conditions are similar, not only the soil but also the supply of water as well. 30

Q. Do you suggest there are springs there? A. Oh no.

Q. So you suggest you have conditions in the absence of springs where the earth is made moist by the gentle rain which falls from heaven and that being so, our pipe lines are slowly being jacked down into the ground by frost action, according to your view? A. I believe that action takes place at that particular point and can take place at other points. For instance, I know of a certain place not far from the Court House where the ground seems to be particularly wet for some reason or other. I do not know why it seems to be wet. The ground not far from it does not seem to be as wet as there. 40

Q. I will give you a reason why it is wet in general. The fire department filled it with water in February and snow was on it in the winter

time and no doubt you had some spring rains and no doubt it was influenced by that time by all the three things you mention. A. Well I suppose it is influenced by all the water that got into it previously.

Q. Perhaps you will go further with me and admit that the trench being in that direction and a great deal of water having been pumped by the Edmonton Fire Brigade in that vicinity would no doubt increase the amount of moisture which you found in that soil in June? A. It was my understanding that most of the water the Fire Department pumped went into the hotel and not on the pavement.

10 Q. They endeavored to put some flames out behind the buildings. You heard about that? A. Oh there might have been some water got down between the pavement and the south brick wall of the hotel on account of the porous backfilling back of that south brick wall. I think that water would be inclined to go down in back of the wall. Some might run down under the pavement towards 107th Street, but I imagine the percentage was not very much.

Q. And the reason you say that in your opinion—you give me this as a scientific man, that the pumping of water is the reason you say that did not increase the moisture content on 107th Street is you believe the
20 fire department put the water inside the building? A. I do not believe. I said it did not increase the water content.

Q. Would it in your judgment increase the water content? A. It may have increased the water content a very slight amount.

Q. Now coming back to what I was saying a moment ago. I will put this to you again. I say, and you may agree with me or disagree, that in this city where we have pipes laid under similar soil conditions we could expect that our lines in this place are being slowly jacked down under the earth by frost action? A. Wherever you meet similar conditions to those and heaving action. I think it is properly described as
30 heaving, because it very often does heave sidewalks, although there was no heaving of the pavement here which was done—there may be that heaving action.

Q. Did you make a survey to see whether there was any heaving of that pavement? A. I did not do any more than put a level rod on the pavement and measure the amount of sinking below that straight rod. That is all I did in the way of surveying and the sinking was three inches.

Q. Did that hollow extend clear across 107th Street? A. The hollow extended across the street but not as much as it was at the centre. What I mean is this, that the laying axis went from east to west across the
40 street but the depth was greater towards 107th Street than it was towards the east side and towards the west side.

Q. You mean towards the centre? A. It was greatest towards the centre of 107th Street.

Q. And what was the width of it? A. Oh it was, I should say, five feet. It is very difficult to tell where it begins and where it ends. It goes down gradually.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Cross-Ex-
amination
continued.

Q. Well you put a straight edge on it. A. Well it is rather an ill defined point.

Q. You put a straight edge on it? A. Yes.

Q. And how wide was it? A. Well about five feet. The photograph will show it (looking at photograph); at one place it was seven feet.

Q. Are you estimating that? A. I am reading that off the level rod I put down. That is as near as I can read with this magnifying glass, and the fact that I cannot get the exact point of contact there. That width varied as you went across the street, you see.

Q. Now I put this to you. You have no doubt we have lines laid under similar conditions to that of 107th Street. We have not found the only soft spot in Edmonton? A. There may be other places. 10

Q. Well have you any doubt of it? A. I have no knowledge of where the mains, the gas mains in this City run. I know there is one back of the Corona Hotel and crossing 107th Street, but I have not any idea where the gas mains run.

Q. May I tell you we cross three hundred streets. Now have you any doubt we run across similar spots as far as western conditions are concerned? A. Well it is possible. I have no knowledge of whether they do or not. 20

Q. And perhaps your view is that we do not, and this is the only place we are being jacked down. Is that your view? A. I would not say that is the only possible place. There may be other places. I don't know.

Q. Well, I will go on the assumption first that it is the only place. Did you as an engineer see anything in the soil conditions whereby any other engineer putting pipe through there should have anticipated a jacking down of this soil through frost action? A. The knowledge of the action of frost was not as well known in those days as it is now. I do not know in 1923 whether there had been any signs of heaving of pavement in the various parts of the City. The City Engineer could tell us that. I have not the slightest doubt but what there was some heaving. I know the centre of the street car tracks heaved up and there are other places. It is a well-known phenomena not confined to Edmonton. It is anywhere where there is a clay soil. 30

Q. I take it that you mean that this heaving of pavement came from a soil condition similar to that of 107th Street. Is that your view? A. Wherever the conditions for heaving are present, it may take place.

Q. And I was asking you with respect to an engineer going through this place in 1923 and having regard to soil conditions and I ask you to criticize, if you care to, his judgment in going through there. And your answer was that you did not know conditions with respect to heavings were as well known as they are now. You then went on to say that it was a well known fact that in many places in Edmonton and other places pavement heaved. Now surely, if there was any sense in what you said, it was this, that you are associating the heaving of the pavement with the soil conditions I was asking you about at 107th Street. Now were 40

you or were you not? A. I was associating the heaving of the pavement—

Q. With the soil conditions similar to what you found at 107th Street, were you not? If you were not, what is the possible connection?

A. Well, the heaving of a pavement as I have already explained, takes place where the soil is a clay soil and where the water conditions are such as they were at 107th Street. We understand now very well what takes place. That is what is the cause of the heaving, and I cannot remember all of your question there, but I started to take exception to a portion of it, because I thought you had misunderstood me.

10 THE COURT: The question, as I understand it, was this, Mr. Smith understood you as indeed I did, when you indicated the heaving of pavement throughout Edmonton and various places that that had some relation to the kind of soil conditions and frost conditions that we are dealing with in this case. And Mr. Smith wants to know if that is what you mean.

MR. SMITH: Exactly. A. Well, could I have Mr. Smith's question of it please. (Question read). I felt that you had misunderstood my previous statement in regard to our understanding at this date of the phenomenon of the heaving of pavement.

20 THE COURT: As I understand, Mr. Smith got beyond that. He was accepting that statement of yours for the moment and then he was asking what association or relation there was to the heaving throughout the City of Edmonton at the various places of which you spoke, to the soil conditions at 107th Street, the association or the relation and he suggested there was some reason for you interjecting it and he took it, as I did, that it had some relation to the thing we are dealing with here. Now do you understand that question? A. Yes I do but there was—

MR. SMITH: Well, let us just take that part of it. We will assume for the moment that scientists did not know in 1923 as much about frost conditions as they do now. We have got beyond that. A. In examining the soil at 107th Street I found conditions present which were capable of producing a heaving effect at that place. Does that answer Mr. Smith's question?

THE COURT: I do not think it does, but it is your answer.

Q. MR. SMITH: I will accept that. But go on to this. I am showing you a very crudely drawn diagram which I am going to endeavor to explain to you, and then ask to have marked as an exhibit because I want to ask you some questions about it. The top line represents the top of the pavement. The line "A" represents the earth; the hatching that you see around the circle, which is a pipe of course, and the whole of it down to the point "D" is backfilled. Do you follow me? A. Yes.

Q. That is a trench with a pipe in it as crudely as I have been able to draw it. A. Is it drawn to scale?

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Cross-Ex-
amination
continued.

Q. Oh no, this is merely a sketch.

MR. SMITH: I am asking to have this marked as an exhibit. It is not to scale; merely to illustrate some questions.

Sketch made by counsel for defendant, marked Exhibit 71.

Q. The upper line represents the pavement, line "A" the ground, and the circle is the pipe, and the remaining portion is backfill. Now I want you to look at my sketch and I am going to assume that by the jacking action of frost that you speak of, the pipe has been pushed down an inch, as you will observe the pipe is some distance below the line "A"?

A. Yes, sir.

10

Q. And I am suggesting to you that in that jacking action that you then would have a void of a similar size between the top of the earth and the pavement? A. Provided the pavement did not sink.

Q. Now having done that, as I understand your theory, it is that two things take place. There is some compacting of the earth beneath the pipe, that is the earth between "C" and "D"? A. There would be possibly some compacting and some flow.

Q. I am coming to that. And then there would be some flow up on either side? A. Plastic flow, yes, sir.

Q. In the meantime the frost line has been coming down evenly? 20
A. Yes, sir.

Q. So that when the frost reaches the top of the pipe, we have a frost line extending across the roof of the pipe to either side of the trench? A. Yes, sir.

Q. And I can follow that by saying such jacking action would convey itself to the bottom of the pipe? A. Yes, sir.

Q. And then we would have this compacting action to some extent below and the pushing of plastic material up to the sides? A. That is correct.

Q. And there is no doubt whatever that the pushing of that plastic material up to the sides and meeting this descending frost line would compact material, is there? A. That depends a great deal on the water content of the clay. The clay material can be compacted only in so far as the water content can be forced out of it. 30

Q. MR. WOODS: Will you speak louder. A. It would depend entirely on the water content of the clay. It is well known that clay can be compacted only in so far as the water content is or can be forced out of the clay. I mean to say this, if I had a closed cylinder with clay saturated with water in that cylinder, and I had a plunger in the top of the cylinder, you could not possibly force that plunger down by an appreciable amount into that clay. It only shrinks or compacts in so far as the water content can be forced out of it. 40

Q. The water content would, no doubt, go to the top? A. If it could get out, yes.

Q. It would go to the top of the space out of which either the clay or the water could move? A. I did not say why it should go to the top.

Q. We will take a bowl and fill it with water and take this clay at 107th Street and you keep pouring that clay into the bowl, the water would go out of it because water is lighter than clay? A. That is not the process.

Q. Well is that correct? Never mind the process. A. Yes.

10 Q. And there is no doubt in the first place that the equivalent of volume of this sandy clay in that area is heavier than our pipe per foot. There is no doubt about that? A. I suppose it is. I have not made any computation.

Q. But you have no doubt about that? A. I think that can be safely assumed, that the pipe is lighter than the clay soil.

Q. And we had better put a hollow ball into our asphalt? A. Yes, you can put a hollow one if you wish.

20 Q. And there is no doubt whatever that the plastic material, whatever it may be, as the pipe is depressed, will be to some extent compressed to the sides of the pipe and below the advancing frost line. There is no doubt about that? A. I won't admit that that material, clay material, can be compressed until I know whether the water content can flow out of it. Furthermore, with clays we know that the water content in the clay flows out very very slowly.

Q. I am suggesting this to you in passing, that the mixture of sand and clay that you have under 107th Street, if in a moist condition, naturally is the best and most easily backfilled material you have? A. It depends on the water content.

30 Q. But it can be tamped better than any other material in this city? A. If the moisture content is all right. I think very close to ten per cent. is the correct value.

Q. So that your whole assumption in the sinking of our pipe by the jacking motion of the frost is dependent on excess quantity of water in that otherwise splendid tamping material? A. I did not make different experiments to find out what the water content was in that clay. Water content can be quite high in clay and the clay will still appear to be relatively dry. In fact, that clay had enough water content in it so that you could squash it in your hands. It was of a plastic character.

40 Q. What I mean is this, that your whole theory of the sinking of our pipe by conditions in wet soil and the jacking action of frost is dependent upon having an excess quantity of moisture in that mixture of clay and sand, which with a proper amount of moisture is the best tamping material you can get here? A. If the moisture content were around ten per cent. it would make a very good tamping material, I believe.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Cross-Ex-
amination
continued.

THE COURT: Is that question of Mr. Smith's understandable, and if so, is it capable of an answer affirmatively or negatively without qualification or explanation? A. I would say no.

Q. MR. SMITH: I am showing you an area in this city as represented by this model Exhibit 30, and I suggest this to you, that you have just about as complete drainage in the cross section of that street as one could possibly find in this City, haven't you? Look at the number of drains? A. Well, there are a number of drains—

Q. You know that water follows the outside of these pipes? A. Oh yes. 10

Q. And I was not suggesting they were opened. But you will probably agree with all these pipes, knowing the tendency of water to seek the pipe and flow outside, that at various depths we have about as fine a drainage system in there for the street intersection as you could possibly find? A. If the natural water content could reach those pipes they would facilitate the drainage at that intersection, but the natural earth being clay, the natural water content flows very very slowly through that clay to travel a couple of feet.

Q. And the pavement has been on it for a good many years? A. Yes.

Q. So that the water that gets on today is only seepages from the side of the pavement over a good many years? A. Yes. Well to the east along the lane there are what is outside of the pavement as far as the hotel at least, anyway, and the water falling on that soil there would go into the ground and then slowly that water is travelling down towards this intersection. If that water landed on the yards up there it might be several months before it finds its way down to this intersection. The flow through the clay is very very slow. I am quite clear on that. 20

Q. And I take it that the clay is the same in those yards as it was originally under 107th Street? A. That may be.

Q. So that what we have done by the hand of man is to assist this trench and make it a better trench? A. I think these trenches do facilitate the drainage at that particular point. 30

Q. And you even found silt in the conduit box which, according to you, was left there by water moving down that box? A. That is correct.

Q. And I suppose you have no doubt that it moved down through the night of the fire? A. I don't know whether any water from the fire got into that conduit box or not.

Q. There were several holes driven into it and I have no doubt you know those holes filled with water. It would be a logical place for it to go? A. Well, I have not seen them. 40

Q. But you have heard about them? A. Yes, I have heard about them.

Q. And I am giving you a reasonable explanation of the silt you found in the conduit box? A. Well it may have dropped some silt. I don't know at all that that dropped all the silt.

Q. Can you give me a more reasonable explanation of finding the silt in the box than I have given you? A. Well the silt was undoubtedly deposited by the flow of water into the box. What the source is I am not prepared to say. It may have been from the fire or other causes, and it may have been going on for several years rather than for only one night.

Q. Can you think of a more reasonable source of water than I have already given you? A. Well, there are several sources. I don't know what you mean by a more reasonable source.

10 Q. A more likely source? A. Well I thought that I had already said that that was one source. There are others.

Q. I asked you if in your judgment as an engineer you knew of a more likely source of the water travelling westward on that box in which was deposited silt than the one I gave you. If you have answered me all you can, I am content. A. I do not think I can give you any other answer than I have already given you, Mr. Smith.

20 Q. Now I want you to go back again for a moment to the sinking of this pipe. By the way, I intended to carry a little bit further this sketch Exhibit 71, and I suggest this to you, that process of consolidation having gone on underneath the pipe to some extent as you admit, and that plastic material containing whatever water was necessary, to some extent having been forced to the sides of your pipe, I will put this to you, and they are to some extent consolidated, that that water there would tend to water flush that area and greatly consolidate the clay. Am I not right?

A. There is no question of water flushing there at all. There is no point in that.

Q. You have not got enough water for water flushing purposes? A. No, you have not got enough water for water flushing.

30 Q. But we will say that went on every year and our pipe was jacked down and I think the figure you used was half an inch or an inch?

A. We do not know what it did the first year. It might have done that. I don't know.

Q. You were just using them as an illustration? A. Yes.

Q. And we have our backfill compacted to some extent that fall? A. To a small amount.

Q. And that goes on over that second year and once more by pushing the material up the side and meeting the down moving frost line we compact it again. That is true? A. It is more difficult the second year of course. There might be some additional compacting.

40 Q. I am suggesting this to you as an engineer, as something quite reasonable, that in a year or two that process is bound to come to an end because our backfill has become quite compact by the very force you are talking about? A. Eventually the process would result in a packing of the backfill and an increase in the supporting power of that material below the pipe. I cannot admit that it is in a year or two though.

Q. Well, when we learn from Mr. Haddow that by far the greater number of breaks in welded pipes occur in the first year, probably it lends

some support to the idea I suggest to you, doesn't it? A. The amount of sinking probably is sufficient during the first year of any pipe line construction wherever settlement takes place to show up the very weak welds in that pipe line. I think that is quite natural for that sort of thing to happen. The second year they are probably very much less and perhaps the third year there may be none and in the eighth year one may show up.

Q. I am talking to you now about a pipe line that has never had a broken weld in the distribution system, in this city. What do you say about that? A. Well I don't know anything about that. 10

Q. Well I am telling you that and how are you going to associate that with your theory of eight years and a half to slowly force down this particular weld? A. Well I have not made any attempt to associate it.

Q. You are just content to leave that there, are you? A. Yes, I am. I have nothing to say about it at all.

Q. And you will agree with me and perhaps go so far with me as to say that it is something of a coincidence that the broken weld we had in this case was directly over some undermining which was done by the City of Edmonton the year before our weld broke? A. Well it is some coincidence. 20

Q. And it is probably a further coincidence that that break came within a year roughly after the ground was interfered with below us? A. Well it did come within a year, if one is to call that coincidence, yes.

Q. Do you know of any better word to use? I don't. A. No.

Q. And you would simply put that down to coincidence? A. It was coincidence, if you express it that way.

Q. So we have two coincidences with respect to the underground work which was done beneath it and on Exhibit 28 we have three. We have the bending of the ten inch pipe; we have the bending of the twelve inch pipe; we have the bending of the wooden conduit box, and those three things are just coincidences, meeting all with these others, to smash our pipe at one particular place. I have not misunderstood anything, have I? A. Well if you call a coincidence the fact that they all have got into the positions that they seemed to have got into at the time of the break, why of course it is a coincidence. 30

Q. And they got into those positions by three separately dug trenches dug at three different times. Doesn't it look just a bit as if there might have been some subsidence of ground under 107th Street?

A. In connection with the subsidence. I take it you mean a general subsidence of the entire ground at the intersection of 107th Street and the lane. 40

Q. I mean entire. What I have in my mind about subsidence is this, and in my very humble and crude way I will try to put it. I may be wrong. We will say we have a point in the ground where there has been a removal of support? A. Yes.

Q. We have a void we are going to fill. That void then with the line flowing to it will be something more than the vertical and something less than the horizontal. In other words, it will be irregular but it will come in in a sort of irregular funnel? A. You mean insofar as the tunnel in connection with the fifteen inch overflow?

Q. I am leaving that out. Take a theoretical case. Say I have burrowed a tunnel under some ground and any effort to fill that tunnel ground comes down to do it from above—flows down? A. Well the roof just caves in. Is that what you mean?

10 Q. I am suggesting that that can go to considerable heights and have movement of earth from considerable heights to fill the void that I have dug? A. That can take place in sand. I suppose it could possibly take place although I do not know of any cases of it in clay. Clay is capable of arching over a space not too wide and supporting the material above it for some length of time by exactly the same process that a clay bank can stand up vertically for some length of time, for instance as in the C.P.R. cut on the South Side where to my knowledge the clay bank has stood up for twenty years and has not moved down.

20 Q. THE COURT: I understood Mr. Smith's question to be this, suppose you have a void and something comes down to fill it, what is the process by which it comes. Is it as described by Mr. Smith or not?

MR. SMITH: It will fall out as I have described? A. It would be a falling in of the roof of the tunnel until this thing had worked up towards the surface.

Q. It might have gone in any direction and it might extend — A. Well not a great deal. That sandy clay, it would go out to quite an angle and there again the natural moisture content which governs the cohesion of the soil would play an exceedingly important part.

30 THE COURT: When you speak of the roof of the tunnel do you speak of the roof of the void Mr. Smith wants you to suppose? He is speaking of a hole into which the earth goes.

MR. SMITH: That is what I meant.

40 THE COURT: He used the word "void." Is that the word you mean? A. Perhaps I can clear it up in this way. If this is a tunnel in some clay and we won't put any filling in here at all. Now if this is clay soil from here up (indicating with blotting paper), if there is any displacement downwards well it takes place by the falling of the material in at the roof of the tunnel into this hole and that raises it up. There is no slipping of the material sideways into the tunnel. There would be if there was sand but not likely with clay which is a cohesive material.

MR. SMITH: We have some caving from the roof of the tunnel? A. The roof of a tunnel can cave.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Cross-Ex-
amination
continued.

Q. Well assume that it does, because I think you will agree with me that you would not care to dig a hole in a clay bank without supporting it and having it rest there without any support? A. There are tunnels dug in this city without anything to support the roof of the tunnel, when they are digging water lines.

Q. In this case here (referring to model) sheeting was put in? A. That is, sheeting is often put in as an added precaution of protection to the workmen. Where you have life at stake you have to take extra precaution.

Q. I never thought it was put in for any other purpose. And when I said it was put there to prevent caving I was right? A. It would be quite possible to put that hole down there without jacking and have that hole remain there without caving for some considerable time. I have already pointed out that in the C.P.R. cut on the South Side those banks have stood there without caving for twenty years except for a little stuff coming off the surface. And this hole might be there because of cohesive connection. 10

Q. And because it might not, we protect the workmen with sheeting piling? A. Yes. It could have stayed there without sheet piling.

Q. And that could be protection against the earth or clay caving on top of the workmen? A. Yes. 20

Q. Now with respect to the backfill in this trench of twelve inch casing, you said that you had found at the point of the break seven and one-half inches of backfill? A. That was the measurement that I secured from the profile supplied to me by the city engineer. I might point out in that connection that the profile supplied to me by the city engineer is not put in as an Exhibit.

Q. It is not Exhibit 28? A. No. I have it in my office.

Q. But you know perfectly well that at the time the split dresser coupling was put on to stop that leaking in February very considerable space was cleared out around the leak? A. Yes, but that is not the backfilling I am referring to. 30

Q. Well what backfilling are you referring to? Where is the seven inches? A. I am referring to the backfilling away from that particular excavation that was made in order to install the dresser coupling.

Q. In which direction? A. I am not just sure which direction.

Q. Do you show it on your profile or on your plan? A. I think it may be on there.

Q. I am referring to Exhibit 41. A. You are referring to the backfilling under the twelve inch pipe. Something has been said of the depth of that. 40

Q. I understood you to tell Mr. Woods you found that seven and one-half inches. I want to know where you found it at that depth? A. Yes I think that is correct.

Q. Now where was that? A. Well that was—I have not an exact

point. I am assuming that the twelve inch pipe was approximately level in that trench when it was put in there. I have found out that the pipe has sunk six and one-half inches and I find the backfill remaining under it, one inch. If there was not any backfilling under there the backfilling was not seven and one-half inches originally.

Q. You built up your seven and one-half inches by finding one inch remaining and six and one-half have disappeared? A. Of course we have to start out by assuming that the pipe had been backfilled underneath.

10 Q. You assumed a seven and one-half inch backfill? A. No, I assumed that the trench was backfilled underneath the pipe. Now I also assumed that the pipe was horizontal or very nearly so on account of its straightness. There may have been a little bit of sand when they put it in. Then I know that the pipe according to the levels taken by the city engineer has sunk down below the levels of the Dresser couplings in each side approximately six and one-half inches. I find a remaining backfill under the pipe of one inch. My report states that the backfill was seven and one-half inches. Now that is exactly the way I arrive at that figure.

20 Q. In other words, if there ever was seven and one-half inches there, six and one-half of it had disappeared? A. Yes, of course. That is as far as the depth is concerned.

Q. In other words, we have either compacted that seven and one-half inches to an inch or displaced it afterwards around the sides of the pipe through this jacking action? A. Well latterly, yes.

Q. There is no misunderstanding between us there? A. No.

Q. Now about this break. I take it you do not believe in my friend's theory about the break and the twenty-eight foot beam?

MR. WOODS: What is my theory?

MR. SMITH: That there was a twenty-eight foot beam and we had this supported between a brick and a stick.

30 MR. WOODS: No, I was stating in answer to the Court what my understanding of the evidence was.

MR. SMITH: Now if you look at the brick. I mean you adopted it from the evidence given by your witness. Are you placing any importance on those two things? A. No, I am not except that they were there as far as weight is concerned. I am placing importance on the state of preservation but not so far as their supporting power is concerned if that is what you refer to. I place no importance on them as supports for that pipe. They are, relatively speaking, rather small objects.

40 Q. And as a matter of fact you show the brick here not to have reached the bottom of the backfill? A. Well keep in mind that we had to work from a city engineer's profile. The draftsman that drew that plan has shown a very slight space between the bottom and the brick. I dare say it rested on the virgin soil.

Q. But that is indicative that you were not paying much attention personally to these two objects? A. Oh no, not the brick and the stick I am not.

MR. WOODS: My friend Mr. Wallbridge has suggested that we have those two photographs in, taken by Mr. Cameron. One is of the pipe after it arrived at the University? A. Yes.

Photograph taken of pipe after it arrived at the University, filed as Exhibit 72.

Q. And this is of the ends as we have them here taken after you got it to the University; that is the ends of Exhibit 42? A. Yes, sir.

Photograph of ends of Exhibit 42, filed as Exhibit 73.

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Q. Now about welds. I take it that you do not agree with the gentleman from the Technical School, Mr. Kidd, when he told us that seventy per cent. efficiency was a perfect weld? A. Did Mr. Kidd say that?

Q. He did, exactly. A. I think Mr. Woods asked this morning what efficiency I would state as being a first class weld and I said eighty per cent.

Q. Then it follows you do not agree with Mr. Kidd when he said seventy per cent. was a perfect weld? A. To that extent I do not.

Q. You do not agree with him? A. Well those two figures don't agree.

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Q. Well you don't agree with him? A. No.

Q. And in connection with a weld, would you care to give me a definition of what constitutes a good weld? What I am interested in is to get the points to which one looks in determining whether a weld is a good weld or not? A. Well a good weld in my opinion would be a weld in which the weld metal, including the two pieces of material which were to be welded together were properly fused, one to the other, the entire depth of the weld. That weld should not contain any fissure. It should not contain—may I put it—too much gas cavities because it is almost impossible to get welds free from gas cavities although I have seen photographs of welds without them—a properly made weld should not contain slag inclusions and the fusion of the metal should be complete from one side of the piece to the other. I am talking about the ordinary butt welds of course, and not a fillet weld or anything of that kind.

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Q. Now I may have misunderstood you or you may have said something you did not really mean. It is this, in Exhibit 68 I understood you to criticize this because the weld metal had not penetrated between the pipe surfaces. I do not think you meant that? A. Not the weld metal penetrating. At the bottom of the weld the pieces of pipe. You understand, this was a butt weld with no "V" curve to facilitate the diffusion of the metal on each side of the weld at the inside of the pipe. There is in

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that Exhibit 68 the small fissure which indicates in my opinion that the pipe metal on each side of the weld was not completely fused, the one side to the other in the welding process.

10 Q. But you will admit that the pipe metal is pretty well fused in this exhibit better than any of the others, anyway? A. I am looking at that with my naked eye. If you put it under the microscope you would find that a tiny fissure goes up much further towards the weld metal than can be readily seen with the naked eye. I have already explained that the more sharp the end of that fissure is the higher the degree of stress concentration. Therefore it is not the size of the fissure we are concerned with so much as the degree of sharpness of the end of the fissure. That is the important matter in stress concentration. If the fissure be shorter than the others it does not indicate to me any great degree of difference insofar as the defect is concerned. They are both defects in my opinion. One is as bad as the other in spite of the fact that one might be larger than the other. In fact the larger fissure might contain the larger curvature at the end and therefore not have as high a degree of stress concentration.

20 Q. Now after all that I ask you if there was not a pretty good fusion of the two pieces of metal in that weld? A. I looked at this under the microscope last night.

Q. Can't you see it there? A. One can't see with the naked eye all that one can see under the microscope.

Q. What did you see under the microscope? A. I find that there is extending up between the two pieces of pipe a slag inclusion. Slag inclusion does not indicate a fusion of the two pieces of pipe together.

Q. I am showing you Exhibits 65, 66, 67 and 68? A. Yes.

30 Q. Insofar as fusion of pipe metal is concerned which is the best weld? A. It is rather difficult to tell.

Q. Which is the best weld? A. I should say they are all equally bad.

Q. All right. That may be clever or it may not. Which is the best weld? A. I cannot tell you which is the best weld.

Q. And which is the worst? A. I cannot tell you which is the worst.

Q. Then in your judgment these four are all equally bad or all equally good? A. All equally good or all equally bad.

Q. MR. WOODS: And I do not think you meant what you said, "that may be very clever."

MR. SMITH: I am very sorry. I apologize.

THE WITNESS: It is not necessary.

40 Q. You gave me the idea that penetration was one of the important factors. And in order that I may understand what you mean by penetration I take it you do not mean the penetration by the weld metal that is from the rod, but penetration by the torch? A. Yes.

Q. So that the butts of the pipes themselves will fuse? A. Yes, the bottom or the inside of the pipe metal should be fused first, fused together. In doing that there is a pocket made, if I may put it that way. At the bottom of that pocket there is a puddle of molten metal. That puddle is carefully added to by the material that comes from the welding rod. I think that is the correct term. And the weld is built up in that way. The weld should start from the inside of the pipe and be gradually worked up.

Q. What I wanted clearly understood was, because I think there may be a misapprehension about it, the penetration of the weld metal between the pipe is not of great importance granted the pipes themselves have been properly fused and joined together? A. If the pipes have been properly fused together then it is not necessary that the weld metal penetrate through to the bottom. 10

Q. In other words, it is penetration of the torch and not of the metal which is the essential thing? A. Yes, if you put it that way.

Q. Now this matter of pulling apart. You and Mr. Wilson and Mr. Cameron were together when you tested the coupons? A. The test of the coupons from the east weld and from the west weld were tested at the University. I secured a copy of those results and I believe that the experts for the Gas Company also secured a copy of those results. 20

Q. We are talking about the same thing. I merely wanted to confirm it? A. Yes.

Q. And I am sure you will agree that the only satisfactory test of a weld is to pull it and see how really strong it is. That is the last word, in other words? A. I do not know that that is the only test that one could submit a weld to. There is another test made by putting the welded piece in a vice and then bending it over.

Q. What I meant was that by applying force in some way and finding the point at which the weld is broken or disturbed is the best way to find out how strong it is? A. If one is speaking of strength the best way is to apply force. 30

Q. And strength has some relation to an ability to sustain stresses? A. Oh yes.

Q. We are talking about the same thing only I used the word "strength" and you used the word "stress?" A. Yes.

Q. Now this bar (indicating)? A. Well I think the re-inforcement was regular. It might be better but I think it is all right.

Q. Have you made any attempt to calculate the amount of reinforcement? A. No. 40

Q. Do you know what the tolerances are as required by the standard of this continent? A. No.

Q. You know that standards have been set up in various places? A. I suppose they have, yes.

Q. And you are not going to tell me the amount of the reinforcement

is less than any standard you know for a similar weld? A. I have not looked up the standards in connection with reinforcements except that in some of my reading on the subject I did notice that too much reinforcement was not considered to be good practice.

Q. "Too much" might mean anything? A. Well you increase the eccentricity? I mean this, in welding two pieces together where you are welding from one side only it is quite possible that the piece having the most reinforcement might turn out under test to be the weakest of the two pieces.

10 Q. Because your eccentricity might go from the straight line. In other words you unfold? A. Yes.

MR. SMITH: My Lord, I am in a rather peculiar position. Professor Morrison has covered so much ground having regard to pipes and ditches and welding that I need a very short time to learn about it.

Photographs showing the straight edge on the pavement and the sag in the pavement to which Professor Morrison referred in cross-examination, marked Exhibits 74 and 75

At 4:30 Court Adjourns till 10:00 a.m. Friday, January 26th, 1934.

Friday, January 26th, 1934, Court Resumes at 10:00 a.m.

20 Q. When we adjourned early yesterday I said that I might shorten things considerably and I have succeeded in doing it. I want to ask you about one thing. As I understand it when the coupons which were taken from the welds, they were pulled apart just as if the coupon was a flat bar? A. Yes.

Q. And Exhibit 43 was a greater width than the sections you used? A. Yes.

30 Q. It was a curved piece of metal you were pulling? A. Well we cut out a long slice so to speak so that the welded joint was near the middle. That piece of course would be very slightly curved and the test was made on these pieces, I believe four in all.

Q. The suggestion I have to make to you is this, that if the whole pipe were pulled it would show a greater tensile strength than the section which you pulled, I mean having multiplied your section to the area of the whole circumference? A. Yes.

Q. I wonder if you can tell me anything about that? A. I could not hear you for the motor car outside.

40 Q. My suggestion is that if the curvature of your specimen were taken into account say if the whole pipe were pulled, it would give you a considerable greater cohesive strength of the weld than what you found by treating it as a flat bar? A. Well that of course is a pretty deep technical matter and I can appreciate the fact that perhaps pulling an entire round section and dividing that by the cross sectional area of the pipe gives you a certain breaking strength. As a matter of fact that has not

*In the
Suprem
Court o
Alberta*

Plaintiffs
Evidence

No. 44
Ibrahim :
Morrison :
Cross-Ex-
amination
continue

anything to do with the actual cohesive strength of the metal itself or the weld metal. That cohesive strength of the weld metal is entirely apart from what the shape of the pipe might be. Also in this case we have more than just merely a pull on the pipe. I did not go into that in detail, but the pipe is subjected to a bending strength which puts a tension in the bottom and a compression in the top and in addition to that there is superimposed on those stresses another pull due to a tendency of temperature contraction—a rather complicated state of affairs. Of course it might be rather difficult to compute the stresses in a piece of pipe subjected to both bending and pulling and due to the fact that the welded joint is all on one side rather than being symmetrically placed in regard to the walls of the pipe itself. That might be a complicated computation, but I have not made any attempt to make a computation. 10

THE COURT: Mr. Smith just asked whether you would agree or disagree with the suggestion he made to you.

Q. MR. SMITH: Would you agree that the cohesive strength—A. No, I won't agree on the cohesive strength.

MR. WOODS: I think your Lordship should be aware of the fact that Mr. Smith approached Professor Morrison outside and tried to get him to explain this. 20

MR. SMITH: I just want to know if you are taking into account the curvature of the specimen you were using, it would not have given you, perhaps thirty per cent. increase in this fifty-three per cent. you are talking about? A. No I would not say it would give an appreciable increase.

Q. One more question. In figuring per square inch. I am looking at Exhibit 42. I want to know if you figured that from the inside of the pipe to the top of the bead or did you only take the welded portion of the pipe to the top of the bead? A. Well I do not think I have the detailed computations. I think I probably used the welded portion. 30

Q. My information is rather different. Perhaps you will look into that. Perhaps I may put it simply in this way—You did figure these to a square inch? A. Yes. You cannot get the exact width because an irregular sort of section—

Q. But you can pretty well say it is half? A. Yes.

Q. So what I want to know in figuring your square inch—what do you call that? A. The cross sectional area.

Q. Whether you included the unwelded portion of the pipe in figuring that cross sectional area? You might look it up and let me know? A. I will try to if I still have the records. 40

THE COURT: When you speak of coupons do I understand correctly it is the section of the pipe taken out of it for the purpose of the tests?

MR. SMITH: And pulled. The coupon we speak of would be a strip taken out extending on either side of the weld and pulled. That is right?
A. Yes. That part of the testing was done by the defendant's experts.

*In the
Supreme
Court of
Alberta*

THE COURT: All I want to know is what the meaning of a coupon was. A simple answer was yes or no to my question.

Plaintiffs'
Evidence

MR. WOODS: How wide are the coupons? A. Well roughly in the order of an inch and a half wide.

No. 44
Ibrahim F.
Morrison
Cross-Ex-
amination
continued.

MR. SMITH: Perhaps you will recognize what I have in my hand?
A. Well I don't know whether that is the particular thing or not but I am
10 willing to assume it. You can easily measure that.

Q. If we take these two pieces and extend them you will have what we refer to as a coupon? A. Yes, that will be about two feet long.

Coupons marked Exhibit 76.

RE-EXAMINATION BY MR. WOODS.

Re-Exam-
ination

MR. WOODS: I am not sure that I understand what you mean by saying that if in fact it would require a heavier pull — more strength or stress to pull apart a round bar that had exactly the same cohesive strength as a flat bar? That is what I understand my friend—

MR. SMITH: No, you misunderstand me.

20 MR. WOODS: I gather that my friend is instructed and the suggestion is that if that bar has to be broken by a pull it will take approximately thirty per cent. more stress to break that than if that same bar were cut half way down and a half of the bar pulled. Do you understand me? A. Yes.

Q. And I understood you to say to my friend that it might be that it would require a heavier pull—more stress in the one place than in the other—but that fact had nothing to do with cohesive strength. It would not make a variance in the cohesive strength of the weld or of the material if it is unwelded material, at all—that it was attributable to some
30 other factors. Is that right? A. Yes.

MR. WOODS: Can you explain to me what those other factors are if you can do it without delivering a long lecture. A. May I explain what I mean by cohesive strength? The cohesive strength of the metal is not dependent on the shape of the piece concerned. It is dependent on the characteristic of the material of which the pipe, or any other thing, is made. I mean the attraction of one molecule or atom to another is the cohesive strength. It has nothing to do whatever with the shape of the piece or size of the piece, if I may put it that way. Mr. Smith has sug-

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence

No. 44
Ibrahim F.
Morrison
Re-Exam-
ination
continued.

gested to me that on account of the shape of the piece, that is to say on account of the fact that first taking the coupon we made a test of that and found its strength by putting it in a testing machine and finding how much pull it would take to break it, and we found it broke through the weld material. Then we found how much it would take to break a piece of the same material without any weld. And then we found how much it would take to break a piece of the same material without any weld. And then we divided the pull taken on the piece with the weld by the pull taken on the piece without the weld and we obtained what I called the efficient. There are two or three ways of expressing that. You multiply by a hundred per cent. and you get the efficient of that weld and I find it in the neighborhood of fifty per cent. Now let us come to the fact that we have a pulled pipe and we will forget the bending for the time being, and just take a straight pull. It is quite possible that the pull to break the pipe, that the welded joint around it would be greater, taking into account—well greater in proportion—than the coupon would be. And also by the same theory, whatever this theory may be, the pull to break a solid pipe without any weld in it would be greater, and if I take the ratio of those two things I will still get fifty per cent. Have I made myself clear on that ground? 10

Q. Yes, sir. You said we had a weakness at the bottom of the weld and you are stating that would have a certain effect. As I gather, with the stress on that, that bottom would come apart and the top would go together? A. That is the bending action. 20

Q. Well will you explain that action? A. I have a diagram. I have a circle drawn here which represents the cross section of the pipe. It is not to scale. The bottom of the pipe would be here and the top would be here (indicating). Across the middle I have drawn a line. At the bottom there would be a pull on the metal. That is to say, it would be pulled apart or the tendency would be to pull it apart at that point. At the top of the pipe due to bending there would be a tendency to push the metal together. You cannot fracture a piece of metal by pushing it together. The pull at the bottom is the greatest and as we go up around the pipe towards this line, the intensity of it becomes gradually decreasing until it gets to zero at this line and then it changes over to a push and the push becomes gradually increasing until you reach the top of the pipe. That illustrates in as simple a fashion as I can without going into very very technical details, the stresses caused by the bending action of a pipe—the tendency to pull it apart at the bottom and to squeeze it together at the top. 30

Diagram of end view of pipe, marked Exhibit 77. 40

Case for Plaintiffs Closes.

At 10:20 Court adjourns.

At 10:40 Court resumes.

No. 45.

Evidence of John Farquhar.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 45

John
Farquhar
Examina-
tion.

JOHN FARQUHAR, being called as a witness on behalf of the defendant and having been duly sworn was examined by Mr. Smith and testified:

Q. You are an employee of the Northwestern Utilities? A. I am.

Q. And you have been with that company for how long? A. Ten and a half years.

Q. You have been there from the beginning? A. Yes, sir.

10 Q. And what has been from time to time your occupation with that company? A. Mostly laying pipes.

Q. That is in the City of Edmonton and on the main line too, I take it? A. Yes, sir.

Q. And you remember the night of the Corona fire? A. I do.

Q. I believe in the early morning after the fire you did some digging of holes? A. Yes, sir, I did.

Q. And what sort of machine did you use for that purpose? A. An air compressor.

Q. Do you remember the name of it? A. An Ingersoll-Rand.

20 Q. And where there is pavement you first had to cut out the pavement? A. Yes.

Q. And is this machine adapted for that purpose? A. Yes.

Q. And do you remember the first hole you dug that morning? A. I do.

Q. Where? A. On the east side of 107th Street.

Q. And did you get down to the pipe there? A. We did.

Q. And did you examine the wooden conduit box? A. Yes.

Q. And what did you find? A. We found gas coming up the box.

30 Q. And we have heard that that was later vented. But you did not put the vent in personally? A. No.

Q. And then where did you go? A. To the west side of 107th Street.

Q. And did you do the same thing there? A. Yes.

Q. And was the ground frozen? A. Yes.

Q. And you needed the machine to dig out the frozen ground? A. Yes.

Q. And did you go to the conduit box at that place? A. Yes.

Q. And what did you find? A. Found gas there too.

Q. Going in what direction? A. West. The first hole it was going east and the second hole it was going west.

40 Q. And then where did you take your machine to? A. To the centre of 107th Street.

Q. And that hole is where you ultimately found the leak? A. Yes.

Q. And in the digging at the centre of 107th Street I suppose the pavement was first removed? A. Yes, sir.

Q. And then you went down with your drill through the earth. Was it frozen? A. Yes.

Q. And who was operating the drill at the time the leak was discovered? Was it you or your partner? A. No, it was my partner.

Q. And were you watching the proceedings? A. No, I was across at the lane and he called me over.

Q. And what appeared? A. The gas came out.

Q. Was that from the hole made by the drill? A. Yes.

Q. And did you make other holes there? A. No, we just extended our ditch to give us sufficient room. 10

Q. And did you see the drill go through when the hole was discovered? A. The gun was in the hole when I was over.

Q. And did you uncover the pipe? A. The pipe was uncovered on top.

Q. And having got down to the top of the pipe what did you find below the pipe? A. Did not find anything much.

Q. Well in what condition was the ground? A. Well there was practically no earth under the pipe.

Q. Was there any earth under the pipe? A. Just a little that the drill knocked in the hole. 20

Q. What I am talking about is space. Did you find any space around the pipe? A. Yes, there was quite a cavity there.

Q. How big was it? A. I would say approximately twelve inches below the pipe extending about four feet longways with the pipe, but either side of the break.

Q. And about how wide? A. About eighteen inches wide.

Q. Now did you observe anything else? Did you look around on that occasion and observe anything else? A. No, I could not say that I noticed anything particular.

Q. Did you look under the pavement? A. Yes, when we broke through the pavement we found the separation between the pavement and the soil. 30

Q. In what direction? A. In a northeasterly direction.

Q. And what size was it? A. Approximately two and one-half or three inches.

Q. And could you say how far it extended? A. No. I looked in and could see in there a few feet anyway.

Q. Could you see the other end of it? A. Oh no.

Q. At what time in the afternoon? By the way, at what time did you discover the leak? A. About two-thirty. 40

Q. And at what time in the afternoon did you get your split Dresser on there? A. About five o'clock.

Q. Were you there in June when these four lengths of welded pipe were taken up from the crossing at 107th Street? A. I was.

(A witness by the name of Kohn is now excluded from the Court room.)

MR. WOODS: I have no objection to the experts or Mr. Hill staying but any factual witnesses I think it would be better to exclude.

MR. SMITH: I have no other.

Q. Were you there when the pipe was lifted in June? A. I was.

Q. And had you previously seen gas trenches in the City of Edmonton? A. Yes, quite a lot.

Q. Have you laid any pipe in this city? A. Yes, quite a lot.

10 Q. In trenches? A. Yes, sir.

Q. In the gas trenches. And did you examine the soil in the bottom of that ditch? A. The soil below the pipe?

Q. Yes. A. Below that again, it was froze.

Q. I am speaking of in June? A. Yes, we examined the soil after we lifted the old pipe out.

Q. What did you do in the way of examination? A. Tried to ascertain whether there had been any backfilling done before the pipe had been laid in the first place.

20 Q. And how did you go about that? A. Well there was a separation. After you dig a trench there is always a separation left between the virgin soil and the backfilling.

Q. And what did you use to examine it? A. Used a shovel.

Q. And what did you do with your shovel? A. Skinned off the bottom of the ditch.

Q. How far? A. Perhaps about an inch clear across the ditch.

Q. And did you come to any conclusion of your own as to what sort of soil it was. A. Yes, I was satisfied that no backfilling had been done.

CROSS-EXAMINATION BY MR. WOODS.

30 Q. When did you complete the first hole that you gave evidence about? A. On the east side of 107th Street.

Q. When? What hour of the night or morning? A. Soon after eight o'clock in the morning.

Q. It was soon after eight o'clock that you got to the box cover? A. Yes.

Q. And found gas coming out? A. Yes, sir.

Q. And found gas coming out at that point? A. Yes, sir.

Q. And it was after that that the vent pipe was put in? A. Yes.

40 Q. Some little time? A. I don't know. I did not notice it going up. I was on the other side of the street at work.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 45

John
Farquhar
Examina-
tion.

continued.

Cross-Ex-
amination

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 45

John
Farquhar
Cross-Ex-
amination
continued.

Q. And your fellow workmen called you over at the time that the drill went into a hole at the centre of the street and gas came out?

A. Yes.

Q. You were not there when the drill went down? A. No.

Q. You were over at the east side of 107th Street? A. Yes, sir.

Q. And when you uncovered that pipe you found that gas coming on pretty strong, didn't you? A. Yes, I did.

Q. And so strongly that it was blowing the earth away? A. Yes.

Q. I mean if there had been any backfilling there it might have easily been blown away right at that point. That is quite conceivable. A. I 10
don't know where it would have blown to.

Q. Well the gas is coming out at quite a rate and making quite a wind? A. Oh it did not blow it very far.

Q. But the point is that it was blowing down into the loose earth around the bottom of the pipe? A. Oh yes, blowing downwards.

Q. And blowing in the loose earth around the bottom of the pipe? A. Yes.

Q. And how far below the bottom of the pipe was that loose earth? A. About twelve inches.

Q. Eh? A. Approximately twelve inches. 20

Q. So the draft from this escaping gas was so strong that it blew that earth away? A. Well all of it was not twelve inches. We have already knocked quite a bit down in there with the machine.

Q. And this loose earth—the gas was blowing it about? I mean, whatever earth it was, the gas was coming out there so strongly that a foot away it would blow that earth right away? A. Yes, you could see it blowing the dirt around.

Q. Did you measure the distance? A. No, sir, I did not.

Q. You just took a look at it with your eye? A. I just felt it. That was all. 30

Q. You could put your hand underneath the aperture where the break was? A. Yes, sir.

Q. And you found there was a space there? A. Yes.

Q. You did not see the space? A. No.

Q. And I suppose you do not really know whether it was six inches or eight inches or twelve inches or what it was? A. You mean the break—the fracture?

Q. I mean the distance between the bottom of the pipe and the soil underneath. All you did was to feel it with your hand. You could not tell with your hand how deep it was, could you? A. Well near enough. 40

Q. At all events that is all you did? A. I just made a guess at it.

Q. When you scraped the bottom of the ditch after you cut it open you took away a certain amount of loose dirt underneath this joint? A. Yes.

Q. Quite a bit? A. No. There was not very much there to take out. I took it all out with our hands and a trowel.

Q. The two of you working on it? A. Yes.

Q. When you went down to the box culvert the first time did you break the box? A. We did.

Q. What for? A. To see if there was gas coming out travelling along there and to let it out if it was.

Q. Did you do any digging there when they dug up the pipe in June? A. We did.

10 Q. And you saw Mr. Haddow there? A. I don't know Mr. Haddow.

Q. Who did you see there? A. I was not paying much attention to anybody.

Q. You saw them taking the levels, at all events? A. Oh yes, I saw men taking levels. But we were busy getting the work done.

Q. What? A. We were busy getting the work done.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 45

John
Farquhar
Cross-Ex-
amination
continued.

No. 46.

Evidence of Abraham Kohn.

No. 46
Abraham
Kohn
Examina-
tion.

ABRAHAM KOHN, being called as a witness on behalf of the de-
fendant and having been duly sworn was examined by Mr. Smith and
20 testified:

Q. You are an employee of the Northwest Utilities? A. Yes, I am.

Q. And you were an employee at the time of the Corona fire in Feb-
ruary last? A. Yes, sir.

Q. And were you present at the digging of the hole at the east side
of 107th Street in the early morning? A. Yes.

Q. And, to make a long story short, we have heard there was gas
coming through there in an easterly direction. Did you observe that?
A. Yes.

30 Q. And then where did you go? A. Went to the west side of the
street.

Q. And was a hole put down there? A. Yes.

Q. And then did you find anything by going down in that hole? A.
Only a little gas coming out.

Q. And then where did you go to? A. To the centre of 107th
Street.

Q. And the machine which was in use was an Ingersoll-Rand? A.
Yes.

Q. And did you dig a hole at the centre? A. Yes.

Q. And were you there when the drill went through? A. Yes.

40 Q. Just tell me how it went through? What happened? A. Well

it seemed when they got quite close to the pipe the drill naturally went into a cavity.

Q. Did the drill suddenly go down? A. Yes, with a man practically hanging on to it. There was nothing to hold it. It seemed it must have gone into a cavity.

Q. And did anything come up through that hole? A. There may have been a little dirt but not to amount to much.

Q. Did gas come up? A. Yes.

Q. And some dirt? A. Yes.

Q. And did you continue on and open up that hole? A. Yes. 10

Q. What were you doing at the time? A. I was taking care of the Ingersoll-Rand air compressor.

Q. What does that mean? A. Operating the machine, in other words.

Q. You were not operating the drill? A. No. But I was just shovelling dirt back of the jack hammer to keep warm with.

Q. And after you got the pipe uncovered what did you find beneath the pipe? A. Nothing but a small cavity.

Q. How deep was it beneath the pipe? A. I would judge about twelve inches.

Q. And how wide? A. About two feet on each side of the break. 20

Q. That is along the pipe? A. Yes.

Q. And the other direction, how wide was it? A. About the width of our ditch.

Q. You knew there was a ditch there, yourself? A. No, I did not.

Q. Have you gone down into pipelines before? Do you know that pipes are laid in ditches? A. Yes, I do know they are laid in ditches but I have not been down in the ditch really.

Q. Did you look underneath the pipe? A. Yes.

Q. And what did you see? A. I seen a space between the ground and the pavement which appeared like a settlement to me. 30

Q. You saw a space there? A. Yes.

Q. And did you do anything about that space? A. Well I put my arm up into the space.

Q. Did you have an overcoat on? A. Yes, a heavy winter coat with a gauntlet mitt on.

Q. And you put your arm in through that space? A. Yes.

Q. And what direction was that cavity or space running? A. It appeared to me running to the northeasterly direction mostly.

Q. Did it appear to go in any other direction? A. It appeared to run east as well but my attention was attracted to the northeasterly direction 40 more, though.

Q. And what was its appearance? How far did it go? A. As near as I could make out about ten feet is all I could see. Beyond that it was quite dark.

Q. I mean this ten feet is only an estimate? A. An estimate of about ten feet.

CROSS-EXAMINATION BY MR. WOODS.

Q. The last thing you said about cavity was, I understood, beneath the pavement running northeast about ten feet long? A. About that I would judge.

Q. How would you judge it?

THE COURT: He said he could not see beyond ten feet because it was dark.

MR. WOODS: You did not measure it? A. No.

Q. You examined it in the dark? A. No.

10 Q. It was in daylight? A. It was broad daylight.

Q. This was in February was it? A. Yes.

Q. And how big a hole had you made in the pavement? It was big enough to examine a pipe, of course? A. Yes. It was quite a hole. It was a hole just big enough to work into. I am not very well accustomed to that work.

Q. And it was while you were down in this hole you saw this crack underneath the pavement? A. Yes.

Q. And would you give us any idea how deep it was? How deep beneath the pavement was it? A. Well it was enough for me to put my
20 gauntlet mitt and overcoat up to my arm.

Q. And you put your arm in? A. Yes.

Q. Did you touch anything at the other end with your hand?
A. No.

Q. How far did you put your arm with your gauntlet on in? A. I would judge about to there (indicating).

THE COURT: A couple of inches below the shoulder? A. Yes.

Q. MR. WOODS: What do you mean by "you judge?" Do you remember putting it in up to there? A. Yes.

Q. And then you took it out? A. Yes.

30 Q. And is that the way you looked at the hole? A. Well I was looking down the hole.

Q. You were not looking down any hole. You mean you looked along? A. Yes, I looked around it.

Q. And you did not put anything else in to measure it? A. No, I did not.

Q. Why did you say ten feet any more than twelve feet or fourteen feet? A. Well I was just estimating about ten feet of space.

Q. But what I want to get at is why you estimate ten feet any more than fifteen feet? A. It may have been that but on the other hand I
40 had no means of measuring but just the eyesight, I was using, I figured perhaps in the neighborhood of ten feet, but I am sure that it went beyond ten feet but I could see ten feet.

*In the
Supreme
Court of
Alberta*
—
Defendant's
Evidence

—
No. 46
Abraham
Kohn
Cross-Ex-
amination

Q. Again I ask you why do you say ten feet any more than fifteen? You certainly did not measure it? A. I was estimating about ten feet that I looked into this space but it went beyond that still.

Q. You did not put anything ten feet long into it to see that it was ten feet? A. No.

Q. And it might have been six feet? A. It certainly looked more than six feet by judging with eyesight.

Q. Because, you see, there were gentlemen there in June who examined the whole layout. That hole would not have disappeared in June, would it? A. Well it is beyond me—I am not very well up in that kind 10 of work.

Q. Were you there in June when they took the pipe up? A. Yes.

Q. Did you see the same hole? A. I was not looking for it and can't remember.

Q. Did you call anybody's attention to it? A. Yes.

Q. But in June when you were there working in June. You worked along with Farquhar when the pipe was dug up in June? A. Yes.

Q. And you said nothing to anybody about that then? A. No.

THE COURT: That is as to the space underneath the pavement?

MR. WOODS: Yes. 20

Q. Now when the drill went down and the gas was finally discovered there was a hole left by the drill? A. Yes.

Q. And there was dirt flying up through that hole? A. Some dirt.

Q. How big was the bottom of the drill? How big a hole was it that you made through which the dirt was coming out? A. About an inch and a quarter or an inch and a half.

Q. Inch and a quarter to an inch and a half? A. Yes.

Q. And through that hole you saw dirt being blown up? A. Yes.

Q. Now how wide did you make that hole in order to get your hand down to feel where the gas was coming up? How big was the hole that 30 you finally made to get your hand down to feel for the cavity? A. The first time that the break was discovered was shortly after the drill went through. There was no hole much bigger than eight or nine inches at that time.

Q. And you had to get your hand down to feel, as Mr. Farquhar says? A. Yes.

Q. And did you put your hand down? A. No.

Q. You did not feel for the break at all? A. I did not.

Q. And was it at that time you made an estimate of the size of that hole underneath the pipe? A. No. 40

Q. When was that? A. After it was completely opened.

Q. How big was the place? Was the whole earth removed by that time all round there? A. Yes.

Q. And Mr. Farquhar has told us that the way—he gave us an estimate of that hole much along the same lines you have. He says he estimated it by feeling with his hands to see how big he thought the hole was.

MR. SMITH: I did not understand him that way. I think the hole he referred was the break in the pipe.

MR. WOODS: Is that the way you estimated it—by feeling with your arm? A. At the very first I estimated it in that way—at the first time that the hole was opened.

10 Q. I thought you said you did not put your hand down there? A. I did not put my hand there.

Q. Well what do you mean by telling me now you did estimate it by putting your hand down? A. I seen it.

Q. Perhaps we are at cross purposes. I understood you to say that the first time you estimated how big that hole was you did it with your hand. Am I wrong or right?

THE COURT: That is the hole under the pipe?

MR. WOODS: The hole under the pipe? A. I did not estimate it with my hand.

20 Q. You did not have your hand down there at all the first time? A. No.

(Question read): Is that right? A. I meant by that measurement.

Q. You told me that the very first time when the hole was opened the first time the gas came through you estimated the size of that hole in the same way Farquhar had estimated it.

MR. SMITH: The first time the hole was opened the drill went through. It was only an inch and a half hole.

MR. WOODS: I am quite willing to correct it if his answer does not mean what it conveys.

30 MR. SMITH: The first time the hole was opened that was an inch and a half hole. I do not know what you mean by the first time the hole was opened.

THE COURT: As I understood him the explanation was that he estimated it to be what he has said it to be, that he was not intending to say he put his hand down. Is that what you mean? A. Yes, Your Lordship.

MR. WOODS: The first time you estimated it at that size, what had you to go on in making that estimate? Why did you estimate it at that

size? What had you done to enable you to do so? A. Just by judgment of the hole—the size of it.

Q. Well when was that? A. When it was partly opened.

Q. How much of it was opened? A. I would imagine enough for a person to put his hand down there.

Q. Farquhar put his hand down but you did not put yours? A. No.

Q. Farquhar having put his hand down you looked down the place that he had put his hand? A. Yes.

THE COURT: Did you see Farquhar put his hand down? A. Yes, I did. 10

Q. MR. WOODS: You could not see very much of the hole that way, could you? You could not tell whether it was two feet on each side lengthwise of the pipe? You could not see in four feet through a hole as big as that? Did you? A. I estimated the hole about that size at the time but later on it was opened up.

Q. What I want to get at is why did you make an estimate that that hole was four feet long by looking through a hole from the top that was just about big enough to let a man's hand in? That is what I want. A. At the first time I estimated it I did not know how big the hole was but shortly afterwards it was open sufficient for anyone to see the hole was about that size. 20

Q. So that you did not estimate it at all the first time? A. Yes, I did.

Q. Well what was your estimate of it at that time? A. A cavity of about twelve inches underneath the pipe.

Q. And how long? A. I could not say the exact length at that time but it seemed to extend two feet on each side of where it was blowing.

Q. At the time you looked down that hole? A. Yes.

Q. Why two feet? A. Well that is a rough estimate.

Q. But why not twelve feet? A. Well it was quite clear to see the sides of this cavity. 30

Q. But I am speaking of the ends of the cavity each way. Why two feet east and west? A. The ends of the cavity was plainly visible.

Q. You could not put your head through it, could you? It was not big enough for that? A. It was pretty near it but I surely did not put my head there to see if I could get my head in the hole.

Q. And that blowing out of this dirt by the force of the stream of gas that was blowing down from that break in the pipe continued on for how long while you were there? How many minutes? Did it go right along? A. It went right along, yes. 40

Q. And there was dirt blowing out all the time? A. No.

Q. How long did the dirt continue to blow out? A. I would judge a couple of minutes after the hole was opened.

Q. And then it stopped, eh? A. Yes.

No. 47.

Evidence of Frank McCarthy.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 47

Frank
McCarthy
Examina-
tion.

FRANK McARTHY, being called as a witness on behalf of the defendant and having been duly sworn was examined by Mr. Smith and testified:

- Q. What is your occupation? A. Civil engineer.
- Q. Graduated from any institution? A. University of Texas.
- Q. What year? A. 1911.
- Q. What is your present occupation? A. Chief engineer of the
- 10 Natural Gas Department of the Ohio Oil Company.
- Q. And what does that company do? A. They produce, transport and distribute natural gas.
- Q. And are you in charge of these distribution systems? A. I am.
- Q. And pipe-lines? A. And pipe-lines.
- Q. And are you connected with any other pipe-line company? A. I am chief engineer of the Illinois Pipe-line Company, which is an oil carrying unit of the Ohio Oil Company.
- Q. And how many miles of pipe do the natural gas systems contain?
- A. Approximately one thousand six hundred miles.
- 20 Q. And the Illinois Company? A. Approximately six thousand miles.
- Q. And in what States do these various lines run? A. Montana; Wyoming; Utah; Colorado; Texas; New Mexico; Indiana; Illinois; Ohio and Oklahoma.
- Q. And had you had any experience in the laying of pipe-lines?
- A. Yes, sir.
- Q. With welded joints? A. Yes.
- Q. I want to make it plain I am not calling Mr. McCarthy as an expert. What height above sea level do these various distributions—
- 30 MR. SMITH: I should have said I was not calling him as an expert save as to the construction of pipe-lines.
- THE COURT: I suppose the reason for this care about experts is the question of how many and how many in relation to each and so on. I should have said to each subject?
- MR. SMITH: Yes.
- Q. And what is the variation in height where the lines of gas distribution systems are? A. They vary from three thousand one hundred and fifty feet to eight thousand five hundred and seven feet.
- Q. And what is the frost condition of the ground? A. From four
- 40 to six feet in depth.
- Q. And in those places do you lay your systems within the frost line and have you laid your systems within the frost line?

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 47
Frank
McCarthy
Examina-
tion.
continued.

MR. WOODS: This is not opinion evidence; this is factual evidence of something done in Oklahoma, Montana and Texas that has no bearing on this case.

THE COURT: I suppose the opinion will follow after he says he has done it.

MR. WOODS: Well it is factual evidence.

MR. SMITH: I would like to know why the factual evidence is objected to. The duty we have in this case is to show that we followed reasonably good practice at the time we laid our pipeline and surely if I can show elsewhere on this continent with similar frost conditions a uni- 10
versal practice, it is of some value to your Lordship?

THE COURT: I will hear the evidence.

Q. MR. SMITH: What have you to say with respect to these natural gas systems?

THE COURT: You did not get an answer to your question of fact.

(QUESTION READ): "And in those places do you lay your systems within the frost line and have you laid your systems within the frost line?" A. We do.

Q. MR. SMITH: How many years' experience have you had with the laying of pipe lines? A. Twenty years. 20

Q. And in that twenty years has it been a universal practice to lay such systems within the frost line? A. It has.

Q. Now I suppose you have crossed pavements with gas lines? A. Yes, sir.

Q. And have you crossed pavements with welded joints of gas lines?

MR. WOODS: Here I desire to make my objection somewhat more fully. There might be some excuse, perhaps there is, for my friend's previous question as to the laying of pipe generally in a frost line because of the presence in the statement of claim of an allegation of negligence that this pipe was laid in the frost line; although that of course refers to the laying of this pipe at the corner of 107th Street in the frost line and not anywhere else. But there might be some excuse for my friend giving 30
evidence along that line. But when he comes to lead evidence to show that a certain method of laying pipe under pavements is a correct method—of leading evidence to show that Mr. McCarthy or anybody else has done that in Oklahoma or Texas or Illinois or any of these places, he is leading evidence that is not relevant to this case and which has already been excluded by your Lordship when I sought to put in evidence to show that pipes laid, not in the United States but here in this city by the same company had not stood up. 40

THE COURT: My previous ruling, in my opinion, had no relation whatever to the question now under discussion. If it had and you desire to call any evidence along this line I am quite prepared to re-open the

case to give you the opportunity to do so. I certainly did not intend the ruling that I made with regard to the point dealt with previously to which you refer as having any relation to such evidence as this. In fact I am a little surprised that you should suggest it does cover it.

MR. WOODS: I sought to put in evidence from Mr. Garrett's examination for discovery that at a number of places in this city there had been a failure of this company's pipe.

10 THE COURT: May I repeat again that if you think that ruling applies to such evidence as this I will take the responsibility of allowing you to re-open your case.

MR. WOODS: It would seem to me if I cannot put in evidence to show the defendant's pipeline in Edmonton is not a good pipeline, by showing other places where it has failed then the defendant ought not to be allowed to show that the pipe in Edmonton is a good pipeline by showing places in Oklahoma where a similar pipeline has stood up.

20 THE COURT: I do not understand that is where the evidence is leading to. The principles applicable are entirely different. But my ruling is this, that I will allow the evidence subject to objection and if on consideration I find it to be irrelevant, or inadmissible rather, I will disregard it.

MR. WOODS: Very good, my Lord. I want to point out I am not in a position to go down and see what the conditions are in these various States and see what the soil conditions and temperature and frost conditions are in these States, to see whether they are of such a character that a practice there might be quite right here and would not be quite right at the corner of 107th Street and the lane in the City of Edmonton, and I submit that it is not of any materiality—what the position is in these other places because we cannot tell the factors that enter into the situation.

30 THE COURT: The weight of the evidence is different from its admissibility. As I understand it the purpose is to show a general or universal practice in laying pipes and it does not come at all within the principle that I dealt with previously and I repeat that I will give every opportunity to either side for the re-consideration, if you like, of the point with which I previously dealt.

40 MR. WOODS: I called your attention to the fact that the plaintiff did not lead evidence here upon the system of laying pipes. The plaintiffs' evidence was confined to the corner of 107th Street and the lane and the plaintiffs' allegation was that that pipe at that point was laid in a certain way which was improper and this evidence therefore is meeting something that is not alleged and is not in this case.

THE COURT: I will hear it subject to the objection and if it is inadmissible I will disregard it.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 47
Frank
McCarthy
Examina-
tion.

continued.

MR. SMITH: I was asking you about the practice of laying solid welded pipe under the pavement at street crossings. And what I want to ask you is, in your judgment is that a proper practice generally speaking? A. It is.

Q. And have you actually laid such pipe? A. I have.

Q. Much? A. Yes, sir.

Q. And what distances have you laid it with respect to Dresser couplings or expansion joints, to use a general term? A. Eighty feet in many places and one hundred and twenty feet in many other places.

Q. And have you laid any long line—transmission lines? A. Yes, 10
sir.

Q. Using welded joints? A. Yes, sir.

Q. And taking the Ohio companies, what are they? What have you laid? A. Well I can recall one welded line where we have two hundred and fifty miles in one gas system of welded line.

Q. And how far apart are the joints? A. The welded joints are thirty feet apart.

Q. With a total weld of what length between expansion joints? A. Approximately one hundred and eighty feet.

Q. And in your opinion is it, generally speaking, a proper method 20
of construction to go under pavement with welded joints a distance of eighty feet with dressers at either end? Is that good practice? A. It is my opinion it is.

Q. That is what I asked you—in your opinion? A. It is.

Q. Have you had any experience with the breaking of welds? A. Yes, sir.

Q. MR. SMITH: I am not calling him as an expert on the breaking of welds. And I am merely asking him for his experience in the breaking of welds as to time after the laying of the pipe.

MR. WOODS: My friend certainly has not qualified this gentle- 30
man as an expert in welding and the evidence is not material otherwise.

THE COURT: You had better qualify him first.

MR. SMITH: I do not intend to ask his opinion. I am merely asking questions of fact over a long experience.

THE COURT: His experience in the breaking of a weld and the time after laying and so on?

MR. SMITH: Yes.

THE COURT: Oh, I rather think that comes much more closely to 40
the previous ruling I have made because after all in order to meet it properly, that is meet his experience as to each case to which he might refer it would open up a similar sort of thing. That was the main reason for the ruling that I made previously.

CROSS-EXAMINATION BY MR. WOODS.

Q. Have you been examining the soil conditions in Edmonton since you came? A. No, sir.

Q. You have not examined the character of the soil? A. No, sir.

Q. Or made any examination of the moisture content of the soil? A. No, sir.

Q. So that you are not, frankly, in a position to estimate the frost action in Edmonton in connection with the soil, as an expert? A. No, sir.

10 Q. Why do you lay rigid pipe? This is subject to my objection of course.

THE COURT: Of course that is the difficulty that counsel is put into. And I think the fair position ought to be to allow you to go on without risk.

MR. WOODS: Subject to my objection, I would like to know.

MR. SMITH: Your Lordship will observe I am not assenting to anything I have done.

MR. WOODS: Why do you put these rigid pipes under pavement? Is it on account of expense? A. No. We think it is a safety feature.

20 Q. It is in point of fact, looking at the whole picture, less expensive than having to open up an open trench across a pavement and take up the pavement and take up the concrete and finally put down the concrete and the pavement and be at the expense of diverting traffic off that street? It is a good deal less expensive to do it? A. It is not in all cases.

Q. Well in most cases. It seems common sense to me. A. Sometimes it costs more to do it one way than it does the other. It depends a lot on conditions.

30 Q. Well here are the conditions here in this city. I do not know of the conditions in Oklahoma, but the ones at the corner of 7th and Jasper Avenue. That is a paved street going down towards the Parliament Buildings and traffic goes along Jasper when you are going down to the Parliament Buildings, there is a lot of traffic down that street. Now if you take that pavement up you would have to divert that traffic somewhere else, wouldn't you? A. Certainly.

Q. Or else you would have to keep wooden structures across your opening all the time? A. Well we would have tunnels and leave the pavement in place.

40 Q. But if the Gas Company were at the expense of having to pay for whatever workmen were necessary to divert traffic somewhere else and also at the expense of having to take off that seven inches of concrete and take up the pavement and after they are all through to put down the concrete and the pavement, it would cost them more than putting the eighty feet of pipe through the tunnel underneath the pavement? A. In general it would, yes, sir.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 47

Frank
McArthy
Cross-Ex-
amination

Q. Again subject to my objection. Do you have your welded joints inspected from time to time? A. We do.

Q. How do you do it? A. In a city distribution plant they will make weekly inspection of our curb boxes and inspections at intervals of the manholes, and our inspection holes which are set over the pavement.

Q. How big are those inspection holes? A. They are usually two inch pipes.

Q. There is a pipe two inches in diameter running down through the pavement? A. Yes, down to the pipe below. 10

Q. And that is plugged? A. On top.

Q. And when your inspector comes along he takes the plug out and flashes it, I suppose? A. Yes, sir.

Q. That is he lights a match or has a torch and he lights it to see if there is any gas coming up? A. That is the way.

Q. And it is done for a week? A. Every ten days.

Q. And one of these would be right over every weld that you had? A. No, sir.

Q. How many of them would go across an eighty foot street? A. We would have one. 20

Q. At the centre of the street? A. Approximately the centre of the street. There might be some structure that we could not get into.

Q. And how much play do you allow for in the pipe, in inches? Let me put it this way. You have got an eighty foot pipe across the street, a head of pipe. As it is put in in the first place it is horizontal and straight? A. Yes.

Q. How much do you reckon that is going to drop from the horizontal between the dresser couplings? A. Well we won't lay our line with play in it that way.

Q. You do not allow for any? A. You mean to be perfectly straight? 30

Q. No. It is straight in the first place. But you as the engineer in connection with laying the pipe—do you contemplate that that pipe will depart from its horizontal position by bending downward to any extent in the course of its operation? A. It probably will.

Q. And do you contemplate that it will bend down any particular amount? How much play do you allow? A. What we anticipate?

Q. Yes. Give me the amount that you think would be—how much would you anticipate in an ordinary city crossing, an eighty foot street? How much anticipation? A. As a maximum, one-half inch. 40

Q. You would not then of course lay your pipe with an anticipation of it sagging or sinking more than half an inch? A. No, sir, we would not.

Q. And consequently the strength of your welds would correspond with that anticipation. You would make your welds strong enough to stand the sinking of half an inch but it would not make your weld

strong enough to standing a sinking of four inches? A. Well I do not quite get your question.

Q. Perhaps it is somebody else that has to do with the welds. Do you have to do with the specifications for the welds? A. We prepare our specifications with consulting our welding foremen.

Q. Have you got a form of your specifications for welds there? A. No, I have not.

Q. Do you remember what they are? A. No, sir.

10 Q. Do you remember anything at all about whether your specifications require the welding material to go through the weld? A. Well the art of welding is changing practically every year. Even the rods that are used have changed. And our specifications are trying to keep up with this art.

Q. Well can you remember? If you cannot remember just tell me. Can you remember whether your specifications today on pipeline construction require welding material to go through the weld? A. Through the weld.

Q. That is to say to completely weld the material?

20 THE COURT: Having regard to the objection and to your cross-examining subject to your objection. I had better perhaps express my own opinion at the moment, at least in respect of this, you are using this witness in cross-examination at your own risk now. That is my own opinion. I do not mean as to numbers, but you are now using him —But the objection is gone in respect to this.

MR. WOODS: He gave evidence of the fact that he had welded pipes across streets.

THE COURT: I do not mean about numbers. I will meet that question when it arises. But of course I am not stopping you.

30 MR. WOODS: His statement to my friend was he had laid pipes across the street. I objected to that and I cross-examined subject to that objection and say "what is the nature of your welds?" I still think my objection is open.

40 Q. It has been stated to me by Mr. Garrett in this case on discovery, as I remember, that in the case of the laying of this pipe line, dresser couplings were put in at the ends of the pipes until you came to a paved street and then, as I gather and my general memory of his statement to me was that a rigid pipe was laid under the paved streets at all events. Can you suggest why expansion joints were put in at one place and not at another? A. To take up the expansion of that eighty foot length of welded line to allow movement of the pipe in those joints.

MR. SMITH: These are all the witnesses I have briefed this morning; and that I have here for this morning.

THE COURT: I can make very good use of the time if we adjourn now. There is no objection to that, I suppose.

At 12:05 Court adjourns till 2 p.m.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 47

Frank
McCarthy
Cross-Ex-
amination
continued.

Evidence of Edgar G. Hill.

Defendant's
Evidence

No. 48

Edgar G.
Hill
Examina-
tion.
continued.

EDGAR G. HILL, being called as a witness on behalf of the defendant and having been duly sworn was examined by Mr. Smith and testified:

Q. What is your profession? A. Engineer and head of a corporation, Vice President and Director of the engineering firm of Ford, Bacon & Davis Incorporated of New York and President of the Ford, Bacon & Davis Construction Corporation of New York.

Q. And are you a graduate of any school? A. Yes, of the Sheffield Scientific School of Yale University in mechanical engineering. 10

Q. In what year? A. Nineteen hundred and four.

Q. And when did you join Ford, Bacon & Davis? A. In September, 1920.

Q. And you have been with them ever since? A. Yes, sir.

Q. And I understand your firm or Corporation was duly commissioned to investigate the natural gas situation appertaining to the City of Edmonton? A. Yes.

Q. And that was in what year? A. Nineteen twenty-two.

Q. And did you come to Alberta as a result of that? A. Yes. 20

Q. At what place in Alberta did you first stop? A. Calgary.

Q. And was there a natural gas system in Calgary at that time? A. There was.

Q. Who was in charge of that system? A. Mr. H. P. Pearson was the managing director.

Q. And you know Mr. Pearson. Is he also an engineer? A. I know him. I believe that he is a natural gas engineer. I do not believe that he is a technical graduate.

Q. Well in any event do you know whether or not he is an experienced man in the natural gas work? A. I know his history. Yes, I know that to be a fact. I have known his history since he was in Canada in 1909. 30

Q. And did that company have an engineer at that time? A. Yes.

Q. Who was he? A. Porter D. Mellon.

Q. And before coming to Edmonton did you discuss the Edmonton situation with them? A. I did.

Q. And then you came to Edmonton? A. Yes.

Q. And did you bring anyone from Calgary with you at that time? A. Yes, I brought with me at that time a man from the Calgary Gas Company, I think his name was Morrison. He was a field man. I think he was in charge of their production operation, that is producing gas from the ground—in the field. 40

Q. And you came to Edmonton. And did you visit what is known as the Viking field? A. I did.

Q. And had there been some wells drilled there at that time? A. There had.

Q. And, to hasten it as much as I can, you then made a report for your company which was no doubt forwarded to your principals? A. Yes, I wrote that report. I wrote the draft of it and the conclusions that I had drawn when I was in Alberta. I know that after I had made my studies here I went back to Calgary and conferred again with both Messrs. Pearson and Mellon.

10 Q. Mr. Mellon is still the chief engineer of that company? A. Yes.

Q. And Mr. Pearson is— A. He is Superintendent of the Southern Natural Gas Corporation of Alabama. It transports natural gas and has distributing subsidiaries, but it buys its natural gas from others. I had also quite a conference with Mr. Eugene Coste in Calgary, the geologist.

Q. He was at one time president of that company? A. Yes.

Q. And did your firm receive a commission to construct the transportation and distribution system which is now in the City of Edmonton? A. It did.

20 Q. And when did you next return to Alberta? A. October or November, 1922.

Q. And did you stay here any length of time on that occasion? A. I would say ten days or two weeks.

Q. What were you doing here? A. I was presenting, on behalf of the Northwestern Utilities Limited which I believe at that time had been formed, their application for the right to do business here and set the rights and so forth before the Utilities Commission.

Q. What I had in my mind was when you next came to Alberta to begin construction of this system? A. In June, 1923.

30 Q. And what local consultations did you make? With whom did you make contact with respect to the laying out of this system in Edmonton? I mean persons who might have some knowledge, in the City of Edmonton? A. Oh yes, when I had been here before I had become quite conversant with the city and its layout, that is the physical layout of the city, that I have to know in planning a gas plant, and I had met a number of the city administrators and the engineering staff; I had made their acquaintance before. When I came here in June I brought with me the nucleus of an engineering organization but I augmented that after I arrived here. I brought with me an assistant from New York, an engineering assistant named Van Poole, and an accountant named Eckes
40 and a natural gas constructor, and an engineer whom I had known years ago in Kansas named Cowan.

Q. And what was Cowan's position? A. Construction Superintendent of the city plant. I also brought with me an expert well driller whom I had known in the old days named Hensroth. I brought this nucleus with me and added to it after I got here.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 48
Edgar G.
Hill

Examina-
tion.

continued.

Q. And what engineering support did you add to yourself in Edmonton? A. I arranged with the City for the loan of Mr. Gibb whom I believe was at that time assistant to Mr. Haddow and I employed Mr. Debney and Mr. Von Auberg and Mr. McKay White, an English engineer who I believe had worked with Mr. Yorath in Saskatoon. Those were the principal members of the engineering staff.

Q. What I want to ask you is this. You have no doubt constructed a great many pipelines and distribution plants? A. I have.

Q. And in your judgment had you at that time employed a sufficient and capable engineering staff for the work which was subsequently done? A. I so considered, yes. 10

Q. Now you say that Mr. Cowan the superintendent in charge of your city plant—before I come to that. Did you buy the pipe for this distribution plant? A. Yes.

Q. Did you buy the pipe which is in the twelve inch pressure line? A. Yes.

Q. And how many dresser couplings did you buy per length of pipe? A. One, with a surplus of one-half of one per cent of each size.

Q. And for each length of twelve inch, .001 I think it is, which is in the intermediate pressure line, you bought one dresser coupling? A. 20 One plus.

Q. Which was a surplus? A. That is correct.

Q. Now did you let a contract for the construction of this system? A. I did.

Q. To whom? A. To Williams Brothers.

Q. Had you previously employed Williams Brothers in any construction of yours? A. No.

Q. And where did you find Williams Brothers? A. In Tulsa, Oklahoma.

Q. I believe as a result of your visit there one of the Williams came to Edmonton and you did enter into a contract, which is in evidence? A. Yes. 30

Q. Did you make some inquiries as to whether or not they were capable contractors before you employed them? A. I did.

Q. And what is the subsequent history of the firm of Williams Brothers as far as pipe laying is concerned? A. I would say that Williams Brothers and their successors Williams Brothers Incorporated, have laid more miles and more tonnage of natural gas mains on the North American continent east of the Rocky Mountains than any other contractor of whom I have knowledge. 40

Q. And did one of those men remain here for the construction of the plant? A. Yes, Mr. David R. Williams.

Q. And I take it that you set up offices in Edmonton? A. We did.

Q. And did you employ inspectors for this city plant? A. I did.

Q. And who was directly over those inspectors? A. Well Mr. O. W. Shultz was the chief inspector. He reported to Mr. Cowan.

Q. What I want to know is was there any arrangement made for meetings of inspectors while this work was in progress and if so how often? A. Every night. Every night after the day's work was finished Mr. Cowan met with his inspectors in his office down town and discussed the day's problems.

Q. You have been there yourself? A. Oh yes, I was on many of those nights. And outlined the next day's work.

Q. You were distributing your time between the distribution system and the pipeline and the field itself? A. I was.

10 Q. Did you buy in so far as the industry went at that time did you buy as good pipe as you could buy? A. Yes.

Q. And did you buy as good dresser joints as you could buy? A. Yes.

Q. Do you know of any better material which you could have bought at that time for the construction of this pipeline? A. I do not.

Q. Now I want to come to the method of street crossings under pavement. We have heard that the method adopted was by welding joints together with a dresser coupling at either end. And is that the method which was adopted? A. Yes, for principal crossings.

20 Q. And who was responsible for determining on that method of crossing these streets? A. I was.

Q. And prior to doing that did you have further conferences with any persons in this country? A. Yes the matter was discussed with my staff and I am quite certain that Mr. Paul R. Johnson of Independence, Kansas, who was here from time to time representing the bankers, was also consulted.

Q. What about the Calgary people? A. Oh yes, I know we discussed that matter with them. I am certain I got the opinions and advice of the various people in this country which was available to me.

30 Q. Did you make inquiries with respect to climatic conditions? A. I did very fully.

Q. And you came to the conclusion to lay this pipe in this way? A. I did.

Q. And did this company save one single cent by laying that pipe in that way? A. No.

Q. Did you pay extra for your weldings? A. I did.

Q. But you had the dressers in stock? A. Yes, that I did not use.

Q. And there are a number of them there yet? A. I believe there are.

40 Q. Now did you adopt, having regard to the information you had after the consultations you had—what in your judgment was the best method of crossing these streets? A. I did.

Q. What influenced you to that conclusion? A. The nature of this city, the kind of soil, the climate, the relative stability, afforded in my judgment by the coupling as against the weld. I had to make the choice and I chose the weld.

Q. Was there any idea of saving money or anybody saving money in doing that? A. Oh no.

Q. Now with respect to the method of crossing the streets. Mr. Haddow's recollection is that there would be a seven foot lane next to the curb and a cut, then a roadway, a cut in the centre, a roadway and a third cut. Do you remember yourself exactly the condition of 107th Street as distinct from any other crossing? A. No.

Q. But was that generally the method as far as your memory goes which was adopted in crossing these streets? A. Yes.

Q. Did you save any money whatever by not cutting the rest of that pavement? A. I made no calculation, but I doubt it very much. 10

Q. And we have heard that the method was to weld four lengths to snake it through the tunnels and open cuts and then join it at either side with the dresser? You have heard that? A. Yes, whatever the number of lengths was up to four lengths.

Q. And in your memory was that the method which was adopted? A. Yes.

Q. Did you then know of any better method of doing that work? A. No.

Q. Do you know now of any better method? A. No, having regard to advances in the art of pipeline construction generally that method would still, in my judgment, be the best I could use. 20

Q. And having told me that and allowing for advances in the various arts which go to the pipeline business, if you had that job of work to do again today, of going underneath these streets, how would you do it? A. The same as I did in 1923.

Q. And did you have any discussions with the City with respect to traffic lanes on these streets? A. I do not believe I did personally. I got a snappy letter now and again if I did not leave proper traffic lanes but I had no verbal discussion. 30

Q. But did you know the City's attitude with respect to completely trenching their streets? A. Yes, I knew this, that they wanted me not to obstruct traffic—

MR. WOODS: I formally object to this. I do not think this is evidence against us—what the City may have done.

THE COURT: Well I suppose that would be right—what the City view of proper construction may have been.

MR. SMITH: It seems to me that the obligation which is upon me is to show that we acted reasonably in 1923 having regard to all the circumstances as of that day. 40

THE COURT: I suppose Mr. Woods' objection is that if the advice of the City was bad Mr. Hill should not have accepted it.

MR. SMITH: I am trying to show the reasonableness in the method adopted.

THE COURT: Having regard to the fact that I think I know the reason for putting the evidence in, and the objection to it, and having said what I have as to its value, you may go on subject to the objection.

(Answer continued): —particularly the fire apparatus and ambulances any more than I could help and the method that was adopted on the street met the requirements of good construction and at the same time, complied with what I knew of the City's wishes.

MR. SMITH: Have you any hesitation in saying that the method which I have described to you is good construction? A. None what-
10 ever.

Q. Now I believe you know a bridge in this city called the Low Level Bridge? A. Yes.

Q. As I recollect it it is in the valley below the Macdonald Hotel? A. Yes.

Q. And did you run this fifteen inch line over that bridge? A. Twelve inch line, yes.

Q. And with respect to welds what line did you put over that bridge—what length of solid line?

MR. WOODS: I object on the same ground I objected this morn-
20 ing, that no evidence of what was done in any other part of the city by the company except at this place is of materiality. The purpose of leading the evidence is apparently for the purpose of showing that the method used was such that in other parts of the city it turned out good. I suppose that must be the purpose of it.

MR. SMITH: I can give you the reason if you want it.

MR. WOODS: Well whether it is or not I object to evidence being given of what was done in other parts of the city.

THE COURT: On what ground do you suggest it should go in?

MR. SMITH: Evidence was led by my friend with respect to the
30 influence of changes of temperature on pipe. And I am showing pipe subject to the most violent changes of temperature in the open at this bridge—

MR. WOODS: The evidence that was led by the plaintiff was led as to this line, that seasonal changes of temperature had certain effects on that pipe as described by Professor Morrison. I cannot remember any evidence led by the plaintiff on the general influence of changes of temperature on the pipe. The changes of temperature were not so much changes of temperature as the seasonal freezing and the effect of frost action on that pipe.

MR. SMITH: There was evidence of changes of temperature with
40 reference to contraction and expansion.

THE COURT: I will hear the evidence. At the moment I think it is quite admissible in view of the evidence of the plaintiff. If, on re-consideration of it I change my view of it, I will disregard it.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 48

Edgar G.
Hill
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 48
Edgar G.
Hill
Examina-
tion.
continued.

MR. SMITH: What length of welded line did you put over the bridge? A. That bridge is crossed with 650 feet of solid welded line with an expansion joint in the centre.

Q. That is 325 feet on each side of the joint? A. Yes.

Q. And is that line exposed to the weather? A. It is not under the sidewalk; otherwise it is exposed.

Q. And have you looked on this occasion to find whether it is still there? A. Yes, and it is.

Q. And did you cross another bridge in this city? A. Yes, we crossed two, the principal is the 105th Street bridge across the Sask- 10
atchewan river by the power house and we crossed a small bridge out on Athabasca Avenue near Government House.

Q. Now on your main line. I put in some cuts. The first is known as Exhibits 69 and 70. Now I want to look at Exhibit 69 and tell me what size pipe that is. A. Ten and three-quarter or twelve inch O. D. pipe.

Q. And did that pipe float on water? A. It did.

Q. And how would you go across that slough? I am speaking of the ditch?

MR. WOODS: This is taken subject to the objection.

THE COURT: Yes. 20

MR. SMITH: How did you get across? A. That ditch was dug with a trenching machine. There was not as much water there when the machine went through. But in the interval between the ditching and the arrival of our pipe, we had had a lot of rain and snow and the snow had melted and had inundated quite a section which had already been ditched.

Q. And how would you sink that pipe in that ditch? A. I plugged up the ends and floated the pipe over the ditch. It was a long solid welded string. I floated it over the ditch and then I took off the plug or plugs and filled it full of water and let it sink to the bottom of the ditch.

Q. And what is the waggon doing there? A. Bringing sand bags in 30
to use to hold the pipe down in the ditch after the water was blown out of it with gas pressure.

Q. And after it was drier was it later covered? A. Oh yes, we went in there the next spring or summer and finished up the backfill.

Q. And I am showing you Exhibit 70. A. That is a similar situation and handled in very much the same way.

Q. And what length of solid pipe have you got there? A. I cannot tell you exactly, but I would say it was between four hundred and six hundred feet, just from looking at it. I would say that was a reasonable distance as I remember it. 40

Q. When I say solid pipe I mean welded pipe without expansions? A. Yes.

Q. You have from four hundred to six hundred feet? A. Yes, that is correct.

Q. Were you up here in June after the fire? A. Yes.

Q. And were you present when this eighty foot length was raised from 107th Street? A. Yes.

Q. And on that occasion did you examine the condition of the bottom of that ditch? A. I did.

Q. Had you seen Edmonton ditching before that—a good deal of it? A. Yes.

Q. You were here during the construction of the whole system?

A. I was here pretty generally through the construction of this system.

10 Q. And what have you to say as to the condition of the earth you found underneath that pipe? A. It was good solid earth.

Q. Would you have any hesitation in laying a pipeline on top of it? A. No, sir.

Q. Did you walk this ditch? A. Yes.

Q. Were you down in it? A. I was.

Q. And you would have no hesitation in laying a pipeline on the soil you saw in it? A. No, sir.

Q. Have you any financial interest whatever in the Northwest Utilities? A. Yes.

20 Q. At one time you had? A. I had a few bonds in 1923 and 1924 but I sold them before I left here.

Q. And have you five cents worth of interest in this company today? A. None whatever.

Q. Could you give me an idea of how many miles of pipeline you have been in charge of laying? A. Well it is well in the thousands, over one thousand. I can say that. In the thousands.

Q. Are you an expert welder? A. No, I am not.

30 Q. Were these welded strings tested before they were put underneath? A. This particular welded string under 107th Street was not tested with air until after it was put beneath the street. And then it was tested to a pressure of sixty-seven pounds per square inch, approximately.

Q. Was this system tested throughout before it was put into operation? A. It was.

Q. Now you have had some experience with line losses of gas—I am speaking of leakages, in many gas systems, have you not? A. I have.

Q. And you have had occasion to see the original books of this company with respect to line losses? A. Yes.

Q. And how would you say this distribution system compares with any system that you know of in North America?

40 MR. WOODS: I object. It is not relevant at all. That is nothing in any way relevant to the issues in the pleadings. There may be all kinds of circumstances.

THE COURT: I think you had better not pursue that.

MR. SMITH: If my friend objects, I will not pursue it any further.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 48

Edgar G.
Hill
Examina-
tion.

continued.

CROSS-EXAMINATION BY MR. WOODS.

*In the
Supreme
Court of
Alberta*
—
Defendant's
Evidence

No. 48
Edgar G.
Hill
Cross-Ex-
amination
continued.

MR. WOODS: I will go as far as I can with Mr. Hill and I will have to ask your Lordship's indulgence over week-end to give myself an opportunity to go into it.

THE COURT: I am quite willing, under the circumstances, to adjourn any time this afternoon you desire.

MR. SMITH: May I ask one question I had forgotten.

Q. I intended to ask you about laying. Is it a general practice on this continent to lay natural gas mains within the frost lines? A. Yes.

MR. WOODS: I was going to say that I, frankly, have not had any 10 chance to get the cross-examination arranged.

THE COURT: I am quite willing to increase the week-end holiday by an hour or two if anybody else desires it.

Q. MR. WOODS: You have told us you were connected with Ford, Bacon & Davis Company and that they were employed by this Company as the construction engineers on this system. That is the position, as I take it? A. They were.

Q. And you are the man who is responsible for the way the system is put down? A. I am the only one, yes.

Q. And if that main at the corner of 107th Street and the lane is 20 improperly put down, we have got the man here who is responsible for it? A. You certainly have.

Q. There is no doubt about that? A. There is no doubt about that.

Q. And that applies to all features—welding and everything else? A. Yes. I was in charge of the project and I will take the responsibility for any errors that were made, either in omission or commission. There is nobody else but me to bear the burden.

Q. And it is you who were responsible for the specifications that are in here that Williams Brothers had to live up to? A. I am.

Q. The weight of the twelve inch pipe is approximately thirty-two 30 pounds in length in random length. What thickness of pipe would that be? A. Quarter inch.

Q. Steel pipe? A. Steel pipe.

Q. And looking at the rest of the specifications, I may be wrong. The only thing I see here that might have to do with the welding of the pipe is that clause that says under "laying pipe" that the pipe is to be laid in a good workmanlike manner to the depth above described. A. There is no specific provision in the contract for welding, because when those specifications were drawn the pipe and couplings had all been ordered and there was no great amount of welding contemplated. 40

Q. But when you did come here, you, in consultation with some

others decided upon putting this pipe under the city pavement in a rigid form with welded joints? A. I did.

Q. With Dresser couplings on each side under the pavement?
A. Yes, I did.

Q. And, as you quite frankly said, it was your responsibility to choose whether to put a welded joint in the middle of the street or a Dresser coupling in the middle of the street, and you chose the weld? A. I did.

Q. When you decided upon the system of laying the pipe, I suppose I am right in suggesting to you that what you really did was to decide
10 in a general way. You decided to cross streets in that way by welding the pipes together and pulling them through a trench. That was a general decision covering all paved streets? A. Yes, it was.

Q. And those were the instructions given to the contractors? A. Yes.

Q. And they were given by you as a result of your general survey of conditions in the City of Edmonton? A. They were given by me to Mr. Cowan and by Cowan to the contractor as a result of my decision based on all the facts and on all the judgment of others—that is, the opinions of others—that I had available. I took the facts as I saw them and I got the opinions of others and I weighed them and I made my
20 own decision.

Q. What I am really after is this. Taking this particular district at the corner of 107th Street in the lane south of Jasper. At that time there were constructions at that corner such as we see here on this model. There was this sewer going north and south, and there were these constructions from manhole "A", and all of these constructions were there except this conduit box which was built in 1926 and this fifteen inch tile overflow? A. Oh there were constructions there but no interferences.

Q. But those things were there? A. Oh yes.

Q. And when you decided on this general way in which you pro-
30 ceeded, did you take into account these constructions? A. In particular?

Q. Yes. A. No; only what were shown on the construction plan.

Q. Well, what was shown on the construction plan? A. Well, the plan is in evidence here and you can see.

Q. Just what was shown on Exhibit 37? A. Yes.

Q. And there are none of these constructions shown on that plan that I can see. A. No, there were no sewer constructions shown at 107th Street.

Q. And you did not, nor do you know of anybody that did make any special examination of this particular place at all, none of the people with
40 whom you consulted? A. No.

Q. Really, this method of crossing these streets was a general conclusion come to—the best general conclusion you could come to with respect to crossing of all the city streets under pavement, and had not particular regard to any special crossing or crossings? A. No not unless there was interference. The only interference would be shown on the

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 48
Edgar G.
Hill
Cross-Ex-
amination
continued.

drawing and they would be taken into consideration. Unless the drawing showed interferences, we would use standard construction, unless something showed up that would cause some responsible person to bring it to our attention.

Q. What I am getting at is this. Mr. Smith, in examining Professor Morrison yesterday, asked him certain questions along the lines as to whether the trench in the soil would carry down along these sewer pipes underneath the ground at that point—would act as an agency to drain the moisture out of the soil. I suppose you would agree it might? A. I am not a sewer engineer. I have never done any sewer work and I would say I don't know. I think it might reasonably. I have never set up particularly as to how sewers acted. 10

Q. And I suppose you would agree with me that if it—if there was moisture taken out of that ground, it would shrink to some extent? A. Oh, over the course of time it might. I don't know. I would rather not pass any opinion on the effect of sewer construction on ground because I don't know anything about it and I would rather not guess at it.

Q. When you decided on this method of construction, and that included the crossing at 107th Street, of course? A. Oh yes.

Q. Did you take into account the likelihood or possibility of your twelve inch main sinking to any extent? A. No. That is beyond a matter of from the straight line. I gave no consideration to subsidence occurring to any extent beneath paved streets. 20

Q. So that—well I am not cavilling about an inch or half an inch. I am not bothering about that. Mr. McArthy has told us that he would take into account that a pipe might go down half an inch. I would not regard that— A. I am talking about any major subsidence. I did not anticipate any major subsidence underneath those paved streets.

Q. And there has been a subsidence in this particular twelve inch main, as we have it in evidence, of some six and a half inches from the horizontal, and that you would say was a major subsidence? A. I would consider that a major subsidence. 30

Q. And you did not take into account the possibility of any such subsidence as that in the twelve inch main? A. No.

Q. And am I right in suggesting to you that if you had had that possibility in your mind that you would have taken particular pains to see that that weld in the middle of the street or where the pipes joined together was made considerably stronger than it was made? A. Well, if I had been considering major subsidences under my paved streets I would have changed my plan. 40

Q. I quite agree. If there had been any thought in your mind that this twelve inch main carrying that thirty-five to forty pounds pressure gas, dropping to such an extent that it dropped, you would not have had it in the form of a weld; you would have had it in the form of a Dresser coupling? A. I do not know. When we came to make this decision

about welds versus couplings, we had to think about those things because the problem was to keep the gas out from under those pavements, that is, we did not want leaks under the streets with gas floating around and getting into the stores. It is easy enough to handle a leak in the open, but you have to be pretty careful under a concrete slab and I had to weigh the probabilities of subsidence against what I thought was the probabilities of rubber leaks through the couplings.

10 Q. When you were weighing that problem, how much subsidence did you have in your mind as being possible? You had to weigh those two things. That was your problem. Now you must have had some maximum amount of subsidence in your mind at that time? A. No I had not. Pipe laying was not at that time and is not today, a very exact science, and I made no beam calculations. I did not figure my pipe as a beam. We were handling welded strings and we do not think much of an inch one way or the other with them, but I am frank to tell you that I did not sit down and make any precise calculations. I undoubtedly, I know I did assume that when our pipeline was in there, it would not change.

20 Q. And it was upon that assumption that you came to the conclusion to put welds in there instead of Dresser couplings? A. Yes, I thought that the chance of major subsidence was less than the chance of rubber leaks in the Dressers. Those were the considerations that governed me.

Q. Because you assumed there would be no major subsidences?
A. I assumed no major subsidences, yes.

30 Q. But I am asking you this. If you had assumed a major subsidence, suppose instead of assuming there would be none, you had assumed that there would be a major subsidence, am I right in suggesting to you that you would have chosen the Dresser coupling form of construction for the middle weld in the street rather than the welded joint? A. I cannot say. There are a number of alternatives and if I had to compute my pipe as a beam, I think I would have gone a little further and explored some other possibilities. Because the coupling is not the best thing in the world for a beam, because it has certain limitations as to deviation from the straight line and the rubbers when those deviations occur to any extent, out-leak, and there might be other things. I can think now of other things I might have done but I would not want to say if I had not put the weld in I would have gone to a coupling after contemplating major subsidences.

40 Q. Perhaps you will tell me apart from the Dresser coupling form of construction what other thing is there that you could have done to have overcome the matter of a major subsidence? A. The extreme is river construction, namely, which is a construction of reinforcing the joint with an air-cooled river clamp. That is a heavy iron or steel clamp that entirely surrounds the pipe and bolted on each side of the joint and it stiffens the joint to an extent that will permit of the pipe acting to a considerable degree as a beam up to the limit of the strength of the pipe itself. We use that in rivers where we know that for many times in the year the pipe

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 48

Edgar G.
Hill
Cross-Ex-
amination
continued.

will have to act as an unsupported beam. Then there are graduations back from that extreme to a Dresser coupling. There is what they call the sleeve weld, and the lead filled sleeve. There are a number of possibilities known to us fellows in the business which we would certainly consider had we been figuring these pipes as beams.

Q. Dealing with the kind of coupling put on a river construction or the Dresser coupling. Am I right in suggesting to you that these require quite heavy clamps on the outside with bolts? A. Yes, and then there are graduations down lighter and lighter till you finally get to the Dresser or weld which is the suitable for beam design. 10

Q. The Dresser coupling type of construction of a joint which calls for certain nuts and bolts on the outside of the pipe? A. Yes, it does.

Q. What I am getting at is this, that if you have Dresser couplings on a pipe, it is not as easy to pull that pipe through a trench as it would be if you had not? A. Well that is an easy thing to do because all we have got to do is to make up our string with Dressers and tighten them up solid and pull the string under from the back. Here is your Dresser and your string and you are pulling it this way and you run your line through the string and with some hook or attachment and pull it through from the back under. The only thing you have to watch out for is that 20 you do not strain the joints too much in putting them in. That is a simple matter. The Dresser coupling has a bit in the centre ring and if you are pulling from the back you are tightening your string rather than loosening it. It is a very simple matter to pull it back.

Q. It occurs to me that pulling a string like that through with a Dresser coupling on it on account of the protuberance scraping on the bottom of the trench, you might come to grief and it might be easier to lay it in the trench. A.. The only thing is to run a string of horses over and snitch them down. That was not the governing thing. I am frank in telling you that this matter of snaking a Dresser coupling through a 30 tunnel never entered by head.

Q. And there was no reason on that account why you chose the weld? A. No, not at all. We were figuring on the gas getting loose underneath these pavements.

Q. And from what you told me, I would take this to be your concern—to see that the gas was tight and that the element of stresses to which the pipe would be subject, either by a major subsidence or any other particular stresses, was not specially within your contemplation? A. Oh, major subsidence, but the other stress—the temperature stress, we thought a lot about. 40

Q. Well to what extent did you think about it? A. We thought about it enough to determine that it was not of sufficient importance to over-balance the other stress which I felt existed in favor of the weld type of construction.

Q. Well how important did you think it? Do you remember? A. Well I knew it existed and I knew that it would be there, but I also

decided that there was not enough probabilities of destructive temperature stress in the eighty foot length to deter me from using the welded construction.

Q. What was the maximum temperature stress. Do you remember?

A. I could not tell you. It was ten years ago and I have no notes.

Q. I am suggesting to you that all that really happened was you considered it in a general way without especially figuring anything down to pounds pressure with respect to temperature—that you thought that the temperature stress up here generally, in Edmonton, would not be such
 10 as to create a very heavy strain on that pipe? A. Well, I would not want to say I just guessed at it. I think a matter of that importance—and it was important because it involved a great many dollars—that either myself or someone else in the engineering department made a computation.

Q. Well, do you remember? A. No.

Q. All you can advance us now is that you have a general impression that at that time you think you took into account the general question of temperature stresses? A. No, sir, I will not agree to that. I will say I took into account in deciding as between the Dresser and welding construction the matter of the temperature stress and the eighty foot length.
 20

Q. And you cannot tell me what information you had on that subject at all or remember it now? A. Well, I knew the co-efficient of expansion of steel and I had a range of temperature between which I made my calculations—or the calculations were made. I cannot tell you what that range was.

Q. I was right, however, with regard to the stresses coming from major subsidences. Those, you did not take into account? A. I did not; and they never in my pipeline experience treated a pipe as a beam—that is, an ordinary pipe as a beam.

30 Q. Well, perhaps that is a technical way of putting the same thing. But you did not take into account the fact that the eighty foot length between those two Dresser couplings might sink at all? A. Dangerously or appreciably?

Q. More than an inch? A. That is probably all right. It is a nominal amount one way or the other.

Q. You see Mr. Smith has been taking Professor Morrison over a subsidence of one inch on the plan and I am not holding you to that subsidence?

MR. SMITH: That is kind of you. We appreciate that.

40 MR. WOODS: Ford, Bacon & Davis were people who were interested in the company, or were they? A. Oh no.

Q. They simply were the construction engineers? A. Yes, they were employed.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 48
Edgar G.
Hill
Cross-Ex-
amination
continued.

Q. And you were paid a salary? A. We were paid a fee—a net fee. I think it ran somewhere around about three per cent. of the actual construction cost and then of course we were paid out-of-pocket expenses, that is, the salaries of the people who were up here, and whatever their allowed expenses were.

Q. But the type of employment—however, you were paid and by whatever method you were paid, was that you were a servant of the company to do this thing? A. Oh yes, we were their agents in this construction throughout.

THE COURT: I suppose even if they were independent contractors 10
it would make no difference at law?

MR. WOODS: No, I do not think it would make a bit of difference, not in this case.

Q. You have heard of the explosion that happened up here by the contraction of the pipe and the gas escaping from it into a house that was not connected with the gas line. With your Lordship's consent I am cross-examining on this subject now.

MR. SMITH: With your Lordship's permission I am going to object. That fact that this evidence was inadmissible some time ago does not make it admissible now except under the blanket of truth of the wit- 20
ness. Surely, with great respect, it could not be introduced in this way.

THE COURT: What is it?

MR. SMITH: Mr. Woods is telling the witness of an explosion in this town.

MR. WOODS: This witness, in answer to Mr. Smith against my objection, gave evidence of this pipe going across the low level bridge, and that it was a certain kind of construction across the low level bridge subject to certain temperatures and that it had stayed up in connection with the temperature stresses to which it was exposed in that locality. Now I propose to ask the witness whether he has any knowledge of the 30
pipe in the city breaking under temperature stresses under the ground, and the particular case I am at is the case where, according to my instructions, this pipe did break under a temperature stress in another part of the city. I think it comes directly in cross-examination.

THE COURT: You are not suggesting the Archer case, are you?

MR. WOODS: Oh no, it is one I had brought out in evidence with Mr. Garrett. Perhaps I had better get the exact location. This was the case of a house of a man called LaPlahn. It is at or near the corner of 114th Avenue and the lane of 97½ Street.

THE COURT: I will allow you to ask it in cross-examination notwithstanding the objection. I am not quite sure whether it comes within the ruling I have made but even if it does I will allow it subject to the objection.

MR. SMITH: May I complete my objection? I do not know anything about it personally, but I am going to object that if the break they are talking about is anything other than a weld, then it is inadmissible, and I know it must be something other than a weld because there are not any welds.

- 10 MR. WOODS: Have you heard of that case? A. One of my pipes?
 Q. One of this company's pipes in the city? A. No.
 Q. Have you ever heard of it? A. No.

THE COURT: So my ruling has not done any great harm.

Q. MR. WOODS: You have had no conference about it? A. No, I have not—not by that name.

- 20 Q. Well, it is up here in the Norwood District, on the 5th of March, just shortly after this fire, under winter conditions. Have you heard about the gas getting out of that pipe by a break in the pipe at that point and seeping through the ground into a man's house fourteen or fifteen feet away? A. I have heard of two or three fires or explosions up here. I know two of them by name—the Alberta Marble and Tile and Archer. That is as far as the names go. If you can tell us what kind of line it was and where it was, maybe I can tell you whether I know anything about it or not.

- 30 THE COURT: You see, one of the reasons for the ruling which I previously made was what has been said to be the discretion the Trial Judge has to obviate what has been called—if I may be pardoned for putting it in Latin—the necessity, *litum lite resolve*—in other words it gives rise to the necessity of deciding one lawsuit within another because of the difference in the circumstances that may have been present and so on. Indeed in the Babcock case, if you remember, Mr. Biggar built up an imaginative suggestion as to various things that might be taken into account with regard to the question of erection and so on. But, notwithstanding all that, in cross-examination I am going to permit it to be done.

MR. WOODS: Your Lordship will understand in this particular matter, according to my instructions, the break occurred as the result of a contraction in the pipe due to temperature stresses.

THE COURT: What you are saying to the witness is that that is what you are instructed. I do not know whether it did or not.

- 40 MR. WOODS: That is why I am introducing it. It is really on the point my friend examined the witness on.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

—
No. 48
Edgar G.
Hill
Cross-Ex-
amination
continued.

THE COURT: I may say this, that I do not think Mr. Smith's examination with regard to the pipe across the low level bridge is comparable at all to that series of mischiefs with respect to which I made the previous ruling and therefore I do not think it opens up to you as part of your case the right to put the trial in the position that I have already mentioned, and the ruling I made which was more or less an opinion based upon this, that you stated, as I understood you, that you did not intend to go any further than putting in the answers from Mr. Garrett's examination for discovery in proof of the series of mischiefs which you were setting up. I said, that being so my then opinion was that I thought I would probably have to disregard it. Now do I understand you to suggest that you want to put in other evidence of other mischiefs, you suggest, notwithstanding your previous assurance that you did not intend to? 10

MR. WOODS: Your Lordship and I are at cross purposes. I am asking this witness—and of course if I cannot get it out of him I cannot—if he does not remember it there is no object in it but the particular case in question is one of the ones Mr. Garrett gave answer to. My instructions are different as to it. The break had to do with temperature construction in the pipe, which is the very thing Mr. Smith was asking the witness about on the bridge. 20

THE COURT: You may ask it.

MR. WOODS: Do you know anything about that case? A. No, I do not, by name. I have no objection to talking about it if I knew just what it was.

Q. It was a gas pipe in the Norwood District where the gas went into the man's cellar. Mr. Garrett says (reading from examination for discovery: "There was an explosion in a dugout cellar under the house of Mr. Plahn on March 5th, 1932. There was no concrete or brick foundation, the house resting on mud sills. Subsequently it was discovered that there was a broken thread on four-inch screwed line at a coupling about fourteen or fifteen feet from the house." Did you hear of that case? A. Not specifically. I have a general knowledge. I have heard of four-inch screw pipes pulling apart. If that is it I have a general knowledge. 30

Q. Have you heard of a four-inch screw pipe pulling apart due to contraction in the winter? A. If it was not properly handled it could, easily.

Q. Have you ever seen a photograph like that of the pipe at that point? A. No, I have never seen that photograph before.

At 3:20 p.m. Court adjourns till 10:00 a.m., January 29th, 1934. 40

Monday, January 29th, 1934, Court resumes at 10:00 a.m.

Application by Plaintiffs to Re-open Their Case.

*In the
Supreme
Court of
Alberta*

No. 49
Application
by Plain-
tiffs to
re-open
their case
29th Janu-
ary, 1934

MR. WOODS: After the adjournment of the Court on Friday the City Engineer told me that he was quite willing to dig up 107th Street between manhole "A" and manhole "B" in order to disclose the actual condition there so as to avoid any doubt about what the condition was and I thought that would be a good idea and I told my friend I intended to ask Mr. Haddow to do that. He thought it would be a good idea too, and I spoke to my friends later and asked them to arrange for their ex-

10 perts on this branch of the matter getting in touch with the City Engineer and being present and doing the work in such a way as would be agreeable to them. And very late on Friday night I received a letter from my friends, Milner and Company, in which they expressed objection to the way in which the City Engineer, who had by that time got in touch with Professor Cameron, proposed to dig up from the surface and tunnel in from the street and they said (reading): "We have been at all times "and are now ready, willing and anxious to have our experts discuss with "yours any and all methods by which this phase of the problem lying be-

20 "tween us may be honestly determined. We are ready to submit to any "test which is characterized by fairness," but objecting to the method which Mr. Haddow proposed to adopt. They said it would have the effect of destroying the evidence rather than elucidating it. In view of that I communicated with the City Engineer and suggested that the matter be not gone on with (as it was intended to start early on Saturday morning, and it would take thirty-six hours) until the matter could be determined by the Court. And on Saturday morning I got in touch with my friends and it was arranged that the experts should meet on Saturday and see what could be done to show the actual conditions as to settlement or no settlement. My understanding is that that meeting took place and

30 that my friend's experts were to communicate with us as to the method to be adopted, no method having been arrived at by discussion, and we expected to hear from them on Saturday so we could get on with the work. Mr. Haddow tells me he has not heard from them. I spoke to my friend this morning and he has informed me of certain information he got from his experts on the subject and I desire to take advantage of the offer of the City to open up the street so as to avoid any question one way or the other upon this matter, but I want to have Your Lordship's leave to re-open that portion of my case I put in in anticipation of the suggestion that the construction of the City had anything to do with the

40 matter in order to give to Your Lordship the result of a physical inspection of the thing after it had been opened up. And it is my intention to

*In the
Supreme
Court of
Alberta*

No. 49
Application
by Plain-
tiffs to
re-open
their case
29th Janu-
ary, 1934
continued.

accept the offer of the City to do it and I am willing to receive any suggestions from Your Lordship and my friends on the subject. That is my application now.

MR. SMITH: If Your Lordship pleases, I intend reading to you in full a letter written by the solicitors on the record for the defence on the 26th (reading): "Your statement made this evening about six o'clock to Mr. Milner that you propose to commence excavations tomorrow morning at the intersection of the lane south of Jasper Avenue with 107th Street came at this late date in the trial as a very great surprise.

"We immediately communicated with Dean Wilson and Doctor 10
"Cameron, who have been collaborating with us as experts in connection
"with the action. We learned that your Mr. Haddow, the City Engineer,
"got in touch with Doctor Cameron at six forty-five this evening and
"advised him that it had been decided to dig down from the surface at a
"point midway between manhole 'A' and manhole 'B,' and from that point
"to tunnel towards manhole 'A' by shaving down the unfrozen soil between
"the point of beginning and the weir chamber. He also told Dr. Cameron
"that you intended beginning these operations at nine o'clock Saturday,
"the 27th of January, which is in fact tomorrow morning.

"We have been at all times and now are ready, willing and anxious to 20
"have our experts discuss with yours any and all methods by which this
"phase of the problem lying between us may be honestly determined. We
"are ready to submit it to any test which is characterized by fairness, but
"we have no intention whatever of becoming anything more than specta-
"tors of an operation which in the judgment of those who advise us may
"be not only a waste of time but utterly futile. To make it perfectly
"clear our advisers say that what you now propose to do may not and
"probably cannot determine any phase of the questions which are now
"in issue, and may possibly destroy any or all evidence on which this
"problem might be determined. 30

"You should remember that you have had a year and a half to do
"what you propose to do now not on your own property but on property
"over which, from your close association with the City of Edmonton in
"this action, you have had complete control.

"We can do no more at this late date than protest, which we do with-
"out qualification.

"We are sending a copy of this letter to Mr. Haddow."

Then a letter was written the following day.

MR. WOODS: There was a letter received by you from Mr. Haddow.

MR. SMITH: It may be my fault but this is the first I have heard 40
of it. We have not seen it as yet, in any event. If it was mailed it would
not be delivered until this morning.

(Reading): "City Engineer's Department,
 "Edmonton, January 27th, 1934.
 "Milner, Dafoe, Poirier & Martland,
 "Edmonton, Alberta.
 "Re Corona Hotel Fire.

"I beg to acknowledge receipt of copy of your letter, January 26th,
 "addressed to S. B. Woods, K.C., in the above case.

"I take it that we are all anxious to arrive at all the facts in connec-
 "tion with this case, including the possible effect of the storm sewer con-
 10 "struction on the twelve-inch gas line which was fractured. The method
 "proposed by us seems to be the most simple and obvious which could be
 "adopted, and is simply an extension of the method employed in 1932 in
 "collaboration with Mr. Cameron and Mr. Morrison, which to my mind
 "at that time was conclusive. It has become quite obvious as the action
 "proceeds that evidence is being led to cast doubt upon the conclusions
 "drawn at the time that these excavations were made at manhole 'A' in
 "company with your experts, and the excavations now to be made would
 "clear up any doubts that may arise on this point and in my opinion the
 "method would not destroy any evidence but it would rather produce it
 20 "in abundance.

"At the request of Mr. Woods we have postponed the work until
 "the matter can be discussed in Court, but we shall be glad at any time
 "to discuss any other method which would produce the same results. A.
 "W. Haddow, City Engineer."

That was sent by mail and would not reach our office until this
 morning. And then on January 27th, I had the experts who are advising
 us advise me in writing as to what this view of the situation was and on
 Saturday night they have set out the position in these words in a letter
 to Mr. Milner's firm:

30 "Edmonton, Alta., January 27th, 1934.
 "Messrs. Milner, Dafoe, Poirier & Martland,
 "Royal Bank Building,
 "Edmonton.

"Dear Sir:

"We have carefully considered the declared intentions of Mr. Had-
 "dow and have come to the conclusion that any excavations made ad-
 "jacent to manhole 'A' and the fifteen-inch tile sewer are more likely to
 "destroy than to expose evidence suggestive of the effects of the 1930-
 "1931 tile sewer construction upon the subsidence of the Intermediate
 40 "Pressure Gas Line.

"If it is decided that some excavations are to be made, we believe that
 "the following points should be kept closely in mind:

"(1) That access from the surface should be made at a considerable
 "distance Southeast from manhole 'A' or Northwest therefrom.

*In the
 Supreme
 Court of
 Alberta*

No. 49
 Application
 by Plain-
 tiffs to
 re-open
 their case
 29th Janu-
 ary, 1934
continued.

"(2) That an open trench or large cross-section area tunnel should be
"driven slowly and carefully in such a direction as to include the
"Northeast side of manhole 'A' and the weir chamber.

"(3) That this opening should be at least six feet wide throughout and
"preferably eight feet wide, so that the ground can be studied in
"three directions at right angles with sufficient exposure in each
"direction to give opportunity for detailed observations.

"(4) That the depth of the opening should be sufficient to expose the
"bottom of the fifteen-inch tile sewer tunnel.

"(5) That an additional opening should be carried along the fifteen- 10
"inch tile sewer of greater cross-section area than the original
"cross-section of that tunnel, to such a distance as may be deter-
"mined by the results of the observations during that excavation.

"In conclusion we wish to point out that these operations will in-
"volve a very considerable amount of excavation beneath and adjacent to
"the gas lines, and we assume that adequate support will be given them."

Now that sets out much better than I can the view that our people
have as to what this operation may produce and we are of the opinion—
I say "we" as instructed by people entitled to hold an opinion—that at
this time such an operation is more likely to destroy what evidence there 20
is there than to reveal it. And we then say that if someone determines to
go ahead and dig this ground up at this time we do make this suggestion
as to the way in which it should be done, which would be not so likely in
our judgment, to destroy evidence which may be there. Now on the legal
question of re-opening the case at this time, I am bound to say this to you
that it will necessarily involve, and I think perhaps the experts advising
my friend will agree with me that if we do this somewhat extensive oper-
ation it will involve a state of conditions as then found which cannot in
a moment be put in the form of conclusions and so brought before Your
Lordship. And I am bound to say to you that if it is decided to do this 30
thing—open this ground, that it will necessarily involve a postponement
of that phase of this lawsuit because I am instructed it will be impossible
to form any snap judgment as to what information the excavation itself
would reveal. With respect to re-opening the case it is of course one which
is in Your Lordship's discretion but I do, repeating the words of our letter,
say, that after all the time that has elapsed, this question having been in
issue from the time the pleadings were filed this does seem a late date
that my friends should come here now and suggest that their case should
be re-opened to determine the question in issue—well over a year. I think
that is all I have to say. 40

MR. WOODS: As to the last remark of my friend's it will be within
Your Lordship's consideration that it was only on Friday after adjourn-
ment that I became aware of the fact that the City were willing to open
up their street to show the actual fact. Since my friend has read the letter
that he has of his experts to him this is the first time I have heard it.
We have not received any copy of it. We did not know of these sugges-

tions until this moment. I have asked Mr. Haddow and he states that while there is no real occasion for having eight feet of the street opened up he has stated it would be an unnecessary inconvenience to the public and unnecessary expense to do so and it is not reasonable to ask them to go to that expense. I have not had an opportunity to actually determine whether the City will be willing to go that far or not. But I don't know about that. As to my friend's statement with regard to that, with regard to the postponement of the trial, I think that is not a conclusion that one should come to. Certainly I am asking for leave to put this evidence in,
 10 if the City opens the street. The weight of it then will be for Your Lordship. The information disclosed as a result of the survey of the actual thing on the ground as pointed out, will certainly reveal conditions which as I am instructed will dispose, one way or the other, conclusively and at first glance of the issue that has been raised by my friends as to the City's construction having anything to do with the depression under the gas main, and I am asking Your Lordship under these circumstances to permit me to take advantage of the offer made to me on Friday in this regard so that, in the excellent language of my friend's letter "this phase of the
 20 problem may be unequivocally and honestly determined." If Your Lordship thinks it would be more useful to have an independent engineer supervise the matter we are quite willing to have Your Lordship appoint one. Your Lordship has power to do so under the rules and we would be perfectly willing to have any competent engineer act as a supervisor or direct the work and hear suggestions from the other side. We are quite willing to hear all reasonable suggestions. We do not want the City to go to the expense of taking up the whole street if it can be avoided, or even eight feet of it. Mr. Haddow tells me you can go in and if you take certain notes of everything you come to there is no danger of a scintilla of the evidence being destroyed. The evidence is there, and to resolve
 30 this phase of the matter I am asking that the City's offer be taken advantage of.

THE COURT: What rule are you referring to with reference to the appointment of an engineer by the Court?

MR. WOODS: Well I cannot tell you offhand but I was under the impression there was a rule permitting the Court to do that.

THE COURT: My present view of the matter is that the case should not be re-opened apart altogether from the fact that the plaintiffs in their case in chief have attempted to answer a defence which I have described to be that they are relieved from any liability there might be
 40 because of the act of a third person, namely, the City. Unless there can be some definite arrangement as to the method of going about the ascertainment of the evidence which the plaintiffs want to put in I think that more harm than good would be done. What I may do after I hear the evidence in the way of permitting evidence which ordinarily would have been put in in rebuttal, I do not know. But if I could be definitely assured that

*In the
Supreme
Court of
Alberta*

No. 49
Application
by Plain-
tiffs to
re-open
their case
29th Janu-
ary, 1934
continued.

*In the
Supreme
Court of
Alberta*

No. 49
Application
by Plain-
tiffs to
re-open
their case
29th Janu-
ary, 1934
continued.

everybody agreed to this—that an excavation, the method being agreed upon would resolve the question of whether or not the damage ensued from the act of a third person, namely the City, I might if I had power to do it name some person such as is suggested as an assessor, but at the present time I do not think I should exercise a discretion in favor of allowing the plaintiffs' case to be re-opened. What I might do in the way of hearing evidence in rebuttal when the defence is in, is another matter and in saying that I do not desire at the present time, there being such a difference of opinion between the parties to the action advised by their experts, to make any suggestion as to what further evidence the plaintiff might seek, either offered by the City or otherwise. It seems to me that is not part of my duty. 10

MR. WOODS: Your Lordship will observe the necessity of my coming to Your Lordship before taking advantage of the City's offer which would be very expensive and I would like to be sure that that part of the plaintiffs' case would be entitled to be implemented by the evidence so found. I am willing that any reply after should be put in by my friend after they have put in their defence, but I do impress upon Your Lordship the desirability of the standpoint of having the actual condition disclosed under the circumstances. It seems to me it is a matter of common sense that once that is opened out one would be able to tell at once as to whether there has been any settlement of the strata between the tile sewer and the twelve-inch main, because if there were, there would certainly be evidence of cracks. 20

THE COURT: Is that statement one which the other side agrees to?

MR. SMITH: No, My Lord. What we think is that the excavation might destroy, by the excavation itself, what we have established.

THE COURT: At the present time I won't give leave to re-open the plaintiffs' case. What I may do after the defendant's case is in I don't know. This phase of the matter in relation to the law, as I understand, has been in the minds of everybody from the beginning. It has been in my mind ever since the second day of the trial of the action. 30

MR. WOODS: The City is not part of this action?

THE COURT: I understand that.

MR. WOODS: It is a city street. The rule I had reference to was 534 (reading).

THE COURT: Personally I would be very glad if that rule is applicable to such situation if the practice had developed of allowing me to have assessors here to help me to decide between these professional gentlemen. 40

MR. WOODS: I understand, then, that Your Lordship presently refuses my application?

THE COURT: Presently.

No. 50.

Evidence of Edgar G. Hill (recalled).

*In the
Supreme
Court of
Alberta*

EDGAR G. HILL (recalled), cross-examination continued by Mr. Woods:

Defendant's
Evidence

10 Q. In the few questions I am now going to ask you about this subsidence of the twelve-inch main I am asking you to assume that the nature of the construction of the City of Edmonton in 1931, the building of this tile sewer, had no effect in causing any subsidence of the twelve-inch main. I am asking you to assume that. The twelve-inch
10 main, as we have it in evidence, has subsided very recently six and one-half inches. Can you tell to me what caused that subsidence? A. No, sir.

No. 50
Edgar G.
Hill
(Recalled)
Cross-Ex-
amination

Q. Does anything occur to you at all as to what may have caused it?
A. No, sir.

Q. Then do I understand your answer to me to be to this effect, if it was not caused by the City's 1931 construction you cannot suggest any reason or no reason occurs to your mind as to what could have happened?

A. That is so.

20 Q. And it follows, I think from what you say, with that limitation as to it now having been affected by the City's 1931 construction the force that caused it, whatever it was, was not a force that you took into account when you decided to put this twelve-inch main down across this street in the way you did. A. The force that caused the subsidence—I did not.

Q. Now who were the local people who were advising you, again?
A. You mean during construction?

Q. At the time that you decided to use this method of construction.
A. Well the people whose experience I had the benefit of were—well Mr. Gibb was in our organization. You are confining me now purely to
30 Edmonton?

Q. Yes, the Edmonton men. A. Well Mr. Gibb was the only purely local engineer who was in my organization at that time.

Q. And the Calgary men were— A. They were not in my organization except P. J. Murphy, who at that time was City Superintendent of the Calgary Gas Company and whom I borrowed at the start of our operations. He was in our organization at the start. He was a floating inspector. That is, he had a car and chauffeur and covered generally all the work being done in the city. That ran along till about the 1st of Sep-
40 tember at which time he took Mr. Schultz' place as chief inspector.

Q. Well did any of these local men or any advisors of yours at the time you were considering, as you have told us you did carefully consider the matter of laying this gas main across this street as well as other streets in such a way as not to provide for it sinking more than an inch or half an inch, did any of them at that time ever say anything to

you—well is there any discussion between you as to action of frost under the pavement in pressing this pipe down? A. No. That is there was nothing ever mentioned to me as I recollect it about the particular or any peculiar action or depressing action of frost under pavements.

Q. Was there any discussion upon the fact of which we know in Edmonton that pavements here and there heave under frost action? A. Yes. I remember the discussion. I remember our consideration of the matter of occasional heavings of construction in this town. That, I know, was considered.

Q. Well the heaving of the pavement as a result of frost action is the force exerted by the frost action going up towards the pavement? A. Yes. 10

Q. And did it occur to you or your advisers that that frost action, equally goes down sideways? A. No. As far as I am concerned it did not occur to me that there would be downward action or sidewise action of the earth under the pavements due to the action of frost.

Q. Let me see if you and I can get together on this. Frost action under the pavements is the result of the creation of frost crystals? A. Well I don't know what causes it.

Q. It is an action which results in a force being applied on the ground under the pavement. That is clear? A. Well whatever it is it is appar- 20
ently a swelling.

Q. Now if above the place where that swelling happens the resistance is so great that it overcomes any force going up would not it be natural to suppose that the pavement there would not heave? A. The pavement would not heave if the resistance of that seven-inch slab were sufficient to overcome any expansion.

Q. But if beneath that place there is no resistance or little resistance to the action of expansion or swelling the force will go down. That is true? A. It will go in some other direction. It will take the line of least resistance. 30

Q. And did it or did it not occur to you that at a point such as you might find at street crossings in Edmonton that this frost action which you knew of in Edmonton in the winter was of such a character that it might depress under structures under that pavement? A. It did not.

Q. Can you tell me any reason why it did not? A. As I consider, that that pipe would be cased in a frost jacket and that the responsibility of the deep frost jacket below the pipe would be adequate to prevent subsidence due to frost action, that is I—

Q. Did it occur to you that before the frost got down to the under- side of the pipe, before you needed a frost jacket under the pipe that a 40
sinking of the pipe might happen during the course of the operation of the frost in the early part of the winter? A. Not to a major degree no— it did not occur to me.

Q. Did you intend that that pipe should be laid on the bottom of the trench? A. My specifications I think required that the pipe shall lay

down upon the bottom of the trench and I desired the pipeline system to be built according to those specifications.

Q. So that I am right in saying that if the pipe did not in fact lie on the bottom of the trench it was not constructed by your contractors in the way you required it to be constructed? A. If the pipe after it was laid did not rest on the earth at the bottom of the trench, then the specifications were not fulfilled.

Q. I would take it, perhaps I am wrong, but you will tell me. I would take it, from these specifications that your intention was that all the
 10 work should be done by trenching. Am I right? Perhaps I had better refer you to it. You speak of the trench: "The trench shall be of such
 "depth that there shall be at least twenty-four inches of dirt on the top of
 "the pipe, measured from the top of the pipe to the correct grade of the
 "surface of the street or alley in which the pipe is laid. If the actual sur-
 "face of the street or alley is higher than the correct grade the trench
 "shall be cut to the necessary additional depth that will permit twenty-
 "four inches of cover on the pipe when said street or alley is at its proper
 "grade; but, if the surface of the street or alley is below the proper grade,
 "the trench shall be cut to a depth that will permit at least eighteen inches
 20 "of cover on top of the pipe to the actual surface, and at least twenty-
 "four inches cover when the street or alley has been filled to the proper
 "grade."

Then you provide for the question of two lines in one trench, and you go on: "The trench at all times during the progress of the work must be
 "protected by the contractor by barricades and lanterns at street
 "crossings or other dangerous places, and all damages arising from non-
 "protection of said trench or injury done to persons or property during
 "the laying and completion of the line shall be at the cost of the con-
 "tractor, the company to be relieved of any liability."

30 "Refilling trench. After the pipe has been lowered into the trench
 "the trench shall be backfilled. In backfilling the earth is to be filled in
 "and around and on top of the pipe and none left scattered on the sides
 "of the trench."

Q. Now I am right in saying that your specifications, as they were drawn, they contemplate pipe being laid in open trenches across these streets? A. I think that is a fair deduction from these specifications. They were drawn before the precise method of crossing these streets had been determined?

Q. I am coming to that. A. Yes. However, in any specifications of this nature we do not cover every detail of construction as a general thing.
 40 I would say generally your inference is correct.

Q. And I am also right, following on what you say, in stating that after you came on the work and came to the decision you did before putting these pipes through any tunnel that you agreed or acquiesced in a change in the specifications in that regard? A. Well I do not consider that these crossings under the streets, that is to a depth of three feet or

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 50

Edgar G.
Hill
(Recalled)
Cross-Ex-
amination
continued.

whatever it was, were through tunnels. That is the general rule, the excavation extended up practically actually to the underside of the slab so that what we really had was a roofed trench in certain parts. As for a tunnel, if you consider that a tunnel we had earth between the bottom of our pavement slab and our pipe but this shallow construction well we call it a tunnel—it is a very small—well it is about the last thing one could do and refer to as a tunnel.

Q. Well whatever change was necessary in the specifications to permit of this work being done in the way you describe it was acquiesced in by you on behalf of the company. That is what I mean. No doubt of that? A. Oh yes, there is no doubt of that, no doubt at all. 10

Q. How many welders did you have on this work? A. We had on the pipe construction, as distinguished from the service construction, I believe we had seven. Two were on the main line and the city plant.

Q. On this work we are at now on the day in question—I speak subject to correction, but as I remember it Mr. Garrett told me that there were on the 17th and 18th of August or either on the 17th or 18th—the day that this particular section was put in there were one thousand feet of pipe laid on that day. How many welders would be on that work? A. I think there was one welder with that particular gang. That is the twelve-inch main gang that was going down the lane would normally have had one welder. 20

Q. That is the same man doing all the welds? A. The same man would have done whatever field welding was necessary with that gang because I doubt whether there was more than one welder with the gang. I am saying this based on the best information I have been able to obtain from people who are able to know what was done with that gang.

Q. What instructions did that welder receive about how to make his welds? A. From me?

Q. From anybody—you took the whole responsibility for all the features of the work? A. Yes. 30

Q. And of course you have told us you are not a welding man and neither am I. But certainly there must have been some instructions given to the welders by somebody under you, if it was not by yourself. Now what were they? A. To make proper welds. I am sure those instructions were given. As to what detailed instructions were given to the welders, I could not tell you.

Q. Have you inquired to ascertain? A. No, I have not.

Q. And have you any information to give to the Court at all as to whether there were any instructions given to the welders other than a general instruction to make a proper weld? A. No. I would have no contact with the welders myself. Had I seen evidence of improper work I would of course have gone to Mr. Williams. I knew who the welders were. I knew at least two of them by reputation. And I am certain that I never gave the individual welders instructions. The instruction coming to the man must have come from Mr. Williams himself or his assistant. 40

Q. And you have no idea whatever as to what those instructions were. Is that what I understand your evidence to be? A. Well that is as to the—

Q. Nature of the welds— A. Well no. No, I have not.

Q. Do you have anything to say as to whether those welders were told to get their welding material right through the pipe? A. No, I don't know anything definite, of course. But I do know the problems which welders faced in those days. I don't know that anything—I could not know—what specifically was said to any welder by anyone. I know
10 the problems welders in those days faced.

Q. What are they? A. They had the problem of making a good weld on a comparatively light wall steel pipe without breaking through and allowing slugs of molten metal to get into the pipe. They did not want to do that. On the other hand, they did want to make good workmanlike welds that were strong and gas tight.

Q. As tight as the pipe? A. As tight as the pipe—yes. A pin hole leak in the weld would be considered very bad workmanship.

Q. And a crack in a weld would be considered very bad workmanship—a crack at the end of the weld? A. You mean a crack through the
20 weld, a leak through it?

Q. Such as we have had evidence of here. These little fissures or cracks (referring to Exhibit 46). A. We do not know anything about that.

Q. But that would be bad workmanship? A. As we know welding today it would.

Q. And as you knew welding then? A. No, decidedly it would not.

Q. Do I understand you to say that when the system was built a weld leaving a crack like that would be acceptable to the company? A. Well what we would have liked to have had in those days was complete penetration. I am talking now about one hundred per cent standard of perfection—complete penetration with the absence of icicles inside or welding slugs going through into the pipe. That would have been our idea of absolute perfection.
30

Q. What harm would the welding slugs do? A. Well they come on through and get into the regulators and into the valves and cause trouble in the pipeline system and service system generally; mostly in the pipeline system in getting into the regulators.

Q. That is if they slough off from the inside? A. As they come through they very often drop off. They do not hang. They come through
40 as a little slug. It looks like a little piece of slag. In those days we did not know as much as we do now about keeping those little fellows out of the pipeline and still getting complete penetration, and for that reason, as I hark back to the practice in those days we put a higher reinforcement of weld metal on the outside of our pipe than we do today. Today we have ways and means of getting around those difficulties we did not know about then.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

—
No. 50
Edgar G.
Hill
(Recalled)
Cross-Ex-
amination
continued.

Q. Were any tests of the welds made, after they had been done, on the job? A. You mean out on the pipeline?

Q. Yes. I do not mean to see whether it would hold gas, but tests as to the strength of the weld? Were any tests made at all? A. Yes there were.

Q. What were they? A. I recollect that we had a heavy vice in the shop and we occasionally would get a coupon and put it in the vice and hit it and see if it would dent. These were crude tests compared with today's tests, I admit.

Q. Well were they actually done? A. I can frankly say that on this 10
weld of pipe we are talking about there was no weld cut from that. But generally speaking my recollection is we did quite a bit of that testing from time to time of our welds and then I distinctly recollect taking at random a welded bit and attacking it with a sledge to see what would happen to the weld. I think I have outlined—extended, the tests we made at that time other than the tests for tightness. Of course today we have gone further on, but that is what we did at that time.

Q. What you have been referring to is the hammer test or sledge test? A. Yes—hitting it with the hammer.

Q. And none of those tests were made on the line in question, that 20
particular line across 107th Street A. No. You understand when you attack a weld with a sledge you destroy it and it requires the work to be done all over again.

Q. In the ordinary case these welds are made on the ground and the pipe pulled through the trench? A. These welds were made on the ground, certainly.

Q. And there would not be under those circumstances any hammer tests? A. Well there could have been. It is possible if we had cut out a welded section at this particular place that could have been done with that cutout weld. That would have necessitated re-welding the string. 30

Q. But the only test to which this pipe was subject to at that point across the street was a test for the tightness of the weld and not for its strength? A. Other than whatever test the string might have had by being pulled into place, whatever that might have been, by being pulled into place. When you are handling a string of pipe eighty-five feet long you rough it about a bit and there was a certain test that comes in there—lifting it, picking it up, the string has a jumpy action often that very often gives to a practical man a pretty good idea of the strength of his weld; because, you see, any weld that you test you destroy. You cannot ever test or could not test in those days and really cannot today, 40
generally speaking, to test the finished weld you must destroy it.

Q. Are you quite sure? You can test them today in place by the same kind of method that doctors used to test your heart action—one of those little machines? A. I know of none of those things not in the pipeline business. If there is such a process it has not yet become sufficiently commercialized to be known in the pipeline business.

Q. By going along the pipeline with a hammer and listening for the sound of a hammer through something like a stethoscope men put in their ears? A. It is not done in the United States of America and I have never seen it done in my experience.

Q. You did not know of it, at all events? A. I did not know of it then and I do not know of it today.

Q. But as to the particular weld in question you have no doubt whatever that it was not tested as to strength. It was tested purely to ascertain whether it was gas tight; that is whether it would keep the gas in
10 the pipe. Am I right? A. You are certainly right, yes.

Q. Did you get any plan of the city's underground construction at this place before you started your work? A. I cannot say definitely. My engineering department made those drawings..

Q. The reason I ask you is that I cannot find on these plans, if those were the only kind of plans you had, that you had any plan of the underground constructions of the city that would be approximate to the place or about the places you were putting your pipe in? A. I know I did from these warning signs. It would have been impossible for any engineer to have laid out a system of gas pipes in this city had he not known the
20 the underground construction. There were a number of warning signs here, these little round dots of various kinds to show what to look out for.

Q. (Referring to Exhibit 37.) You have here for instance "look out for duct from vault to Cattistock Block" and "look out for telephone vault?" A. Yes, there is a whole list of them all over. And there is one here "look out for light duct." There is a great list of these things all the way up. There must be thirty of them.

Q. You had that knowledge when you came to this street crossing at that time. You had the knowledge of the constructions of the city or a warning of them other than that one that was put in in 1931? A.
30 Well I assumed that the engineers had that. They must have had them. They would not have known otherwise whether they had interference.

Q. And I gathered from what you told me a moment ago that you did intend these welds to be as strong as the quarter inch pipe? A. I did not say that. I said as tight as the quarter inch pipe.

Q. Or as strong? A. No I did not.

Q. Did you intend the welds to be as strong as the pipe? A. No.

Q. Well did you intend them to be half as strong as the pipe? A. I wanted them stronger than that.

Q. What I frankly am getting at is this: you did not anticipate, as
40 you told me, that that pipe would appreciably sink at all? You anticipated that it would stay practically horizontal? A. Well within a reasonable tolerance.

Q. The reasonable tolerance I think we have come to, you and I, has not been approximately greater than an inch. A. Yes that is what I would have expected.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 50
Edgar G.
Hill
(Recalled)
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 50
Edgar G.
Hill
(recalled)
Cross-Ex-
amination
continued.

Q. And for our purposes I am not regarding that as being an appreciable sinking that would substantially cause damage to the pipe? A. It would induce a stress to that extent, but a moderate stress.

Q. You certainly must have intended it to be greater than fifty per cent. of the strength of the pipe or else you would not have specified quarter-inch pipe? A. Well very frankly in those days we did not go to the refinement, we did not have the equipment and did not pull test coupons like we do today. We had not developed the technique of welding. We did not have that developed to today's standard. There is no question but what I had every right to expect in those days a weld having more than fifty per cent of the pipe strength. 10

Q. And would you go with me when you say that you did contemplate having a pipe that at the weld would be as high as seventy per cent. of the strength of the pipe? A. Well I would say that a seventy per cent. weld in those days was better than the average weld made by a good welder. I would have liked to have had seventy per cent welds.

Q. Did you have any particular figure of strength in your mind at all that you now remember? A. No. We did not think about welds in those terms in those days.

Q. What strikes me is this, we all know that a chain is as strong as 20 its weakest link and why would you have pipe stronger than the place of the weld? A. Well because you cannot, except under almost test conditions even today get welds as strong as the pipe. I am speaking now of a commercial matter as distinct from a laboratory matter. Commercially today we can get and do get welds as strong as the pipe. But we do not average that. That is, we do not expect it and do not average it. We can obtain it. That is about all I can say.

Q. What occurs to me from your answer is this that if you, as you have stated, expected that pipe to remain practically in a horizontal position and not to be subject to major stresses caused by the sinking of the pipe to any appreciable extent it is natural to suppose you would not 30 pay very much attention to the weld. Am I right? A. No. We were pretty fussy about our welding.

Q. Well if a pipe is not going to depart from the horizontal then the purpose of the weld is primarily and almost entirely to keep the gas in the pipe and has not any relation to the breaking stress of the weld? A. Well you have a temperature stress that certainly up here is bound to be considered. That is the ordinary strains due to temperature.

Q. You mean the temperature effected in contracting steel itself? 40 A. Yes. That stress runs throughout the steel.

Q. It would be taken up by the dresser coupling at each end? A. It would be under ideal conditions, yes; that is if our pipe were in the ground and a dresser at each end surrounded by gas or air or a vacuum and were so crossed that it could not bond. Then the stress due to temperature would only be what it took to adjust the pipe in the couplings at the end. But that condition does not happen.

Q. I gather from what you told me on Friday that you had a general knowledge and probably a particular knowledge of the amount of contraction that this pipe would be subject to by reason of the temperatures in the place where it was and that you quite expected that to be taken up by the dresser couplings at each end of that pipe. Am I right or wrong?

A. I do not think I said that.

Q. Do you mean it? Did you mean to give me that impression? A. Well the normal ordinary temperature changes would be taken up but that does not always happen.

10 Q. If that were so you would not have to be very particular about welded lines? A. But it is not so. We have always got a certain condition there that we have got to think about and we know that we must not design a pipeline with the thought that temperature is not going to make any difference because it does make a difference and we have to allow for it.

Q. I am right in saying that apart from that limit it certainly would to some extent be taken up by the dresser coupling? A. Oh yes, to some extent.

20 Q. Apart from that element the matter of the strength of the weld was not important to you because you had not ever considered the possibility of it sinking to any appreciable extent? A. There are three things. I can say I did not take into account major subsidence. I did not. But there are three things—strength to resist the internal pressure of the gas, and strength to resist the contracting effect of temperature and you have the strength to resist beam action. Now I took into account the first two things and I took into account beam action only to a limited extent, as I have explained.

30 Q. But I have gathered from what you have said that you were not very specially concerned about the strength of the weld at this point because you did not expect it to be subject to what you have described as beam action. A. I did not design these pipes as beams.

Q. I know that. You have told us that. Can you answer my question? A. I did not consider making any computations of the strength of these welds with respect to the stresses caused by bending movement.

Q. It is not quite an answer to my question? A. Well let us see if we can get together on it. Will you repeat your question and I will endeavor to answer it.

40 Q. You did not pay any particular attention to these welds across this street so far as their tensile strength was concerned, but that what you were particularly concerned in about them was whether they would hold the gas in the pipe assuming that the pipe would stay in a horizontal position. Now am I right? A. No you are not.

Q. In what respect am I wrong? A. Because you have assumed that I would have been satisfied here with a weld that would only have held gas in the pipe. And I would not have been satisfied with that sort of a

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 50
Edgar G.
Hill
(Recalled)
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 50
Edgar G.
Hill
(recalled)
Cross-Ex-
amination
continued.

weld because that sort of a weld would not have taken care of my temperature conditions that might have existed.

Q. You spoke about certain inspectors you had on the work. Did those inspectors test these welds for tensile strength as well as for gas tightness? A. No. We did not test any welds in a machine for tensile strength. We did not have a testing machine. There were not such animals in those days in the business. But we did test them as I have told you.

Q. You spoke about the low level bridge and an expansion joint in the middle. From what you have just told me this morning I do not suppose you desire to convey to the Court there is any similarity between a pipe in the ground in the frost line subject to the stresses that such a pipe is, and a pipe lying on brackets under the low level bridge? A. No. Those conditions are not similar. The only contraction that that pipe has is whatever contraction there might be in the expansion joint and whatever contraction there might be between the pipe and the supports on the bridge. It is subjected, however, to stresses and strains that are in some ways I think more severe than the stresses in a buried pipe. For instance we have the vibration factor coming in there. But it is not a wholly comparable thing. 10 20

Q. I am told that the unsupported length of that low level bridge pipe is twelve feet two and one half inches? A. I think that is about right. It is supported on the brackets underneath the sidewalk and those are very frequent.

Q. And I am told the length between the supports on the 5th Street bridge is sixteen feet two and one-half inches? A. I will accept those figures.

Q. And you have also told me a moment ago about the bonding action of the earth on the pipe in frozen ground? A. We did not have that on the bridges of course. 30

Q. I understand you to mean by bonding action this, take your pipe across 107th Street with two dresser couplings on each side and it is in frozen earth. Now take one foot away from the dresser coupling that pipe is clamped by frozen soil. That is what you mean by the bonding? A. That is a possibility.

Q. And then the capacity for that pipe to shrink in, for the shrinkage to be taken up by the dresser couplings is very much affected by the bonding action of each foot of that pipe right up to the centre, is it not? A. Very much.

Q. So that really that bonding action has a cumulative effect as you get away from the—A. Well you have a fibre stress set up in that pipe which we can calculate and which is constant per degree. Now just how that acts we do not know. So we had better not talk about it. We know the limitations. We know the maximum and minimum contracting possibly up to and somewhere in the middle is probably what we get in practice— 40

Q. But what I am getting at is, we get to the middle of that pipe in the middle of 107th Street and it is welded there. Now there is a contracting or pulling force in that pipe at that point due to temperature?

A. Yes.

Q. And the capacity to which the dresser coupling at each end will enable that contraction to be taken up or to be taken up from the end of the dresser coupling is tremendously affected by the fact that the pipe all the way along is encased in frozen earth and that the frozen soil is eliminating the possibility of that happening? A. Yes. You must not
10 figure your dresser coupling helps you much below thirty-two degrees.

Q. And we have not any such action as that on a pipe at the low level bridge or under a slough or anything of that kind? A. Indeed we have under a slough. You mean in water?

Q. Yes. A. Well we know the minimum temperature of water.

Q. Is there any bonding action of water? A. No.

Q. It is the bonding action I am speaking of? A. Yes. When you get below thirty-two degrees then the effect of the dresser coupling—the aid which the dresser coupling can give you is pretty much eliminated and those stresses must be taken up in the pipe.

20 Q. And from thirty-two degrees upwards there is a proportionate weakening of the possibility of the dresser coupling? A. Oh no. I would not want to say that. From the point where the earth so grips or encases the pipe from whatever point that may be, whether thirty-two or thirty-one or thirty-three, whatever point one assumes from that point on down the value of the dresser coupling is materially lessened.

Q. Well in the low level bridge or on 105th Street bridge your expansion is in the middle? A. Yes.

30 Q. And as you frankly said to me you don't suggest there is any similarity between that case and this case as far as the temperature stresses are concerned and the effect of temperature stresses? A. No. I would say there was not much similarity there.

Q. Now I take it from what you have told me that when you put that pipe down across 107th Street you intended it to be put down straight A. Yes, commercially straight—not with an instrument—but eye-straight.

Q. You intended the bottom of the trench to be straight? A. As finally receiving the pipe it should be commercially eye-straight.

Q. You saw the trench on the 18th of June? A. Yes, I did.

40 Q. Was it straight? A. The bottom of the trench—no. If we consider the bottom of the trench as that surface of the ground which was in contact with the pipe, the bottom of the trench was not straight, that is it had a sag in it.

Q. It was curved downward? A. Yes.

Q. Between the dresser couplings? A. Yes.

Q. And you found it there, you found it on, you said solid ground. We have evidence here, and I do not suppose you disagree with it, that

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 50
Edgar G.
Hill
(Recalled)
Cross-Ex-
amination
continued.

there was about an inch of backfilling? A. Is there evidence to that effect.

Q. I think it is shown in the plans and I think it was given by Mr. Morrison.

MR. SMITH: Mr. Morrison said an inch and Mr. Haddow made it more I think.

MR. WOODS: The backfill on this plan Exhibit 28 is shown in the hatched line running underneath that yellow line which is the twelve inch gas main? A. I don't know just what you mean by backfill. That has been a little disturbing to me. 10

Q. I mean by backfill something that is not the virgin earth—that the pipe has been put in under—made ground, to that extent? A. Made when the pipeline was laid or at some other time?

Q. Made at some time? A. You mean soil other than that originally in place there at the first instance, that is before anything was done around the street at all?

Q. Yes. Did you find that the pipe rested upon such soil as that; perhaps by this time very tightly packed and solid. I don't want to quarrel with your solid ground, but was there anything under it but your virgin soil? A. I could not tell. I went down in that trench and endeavored to determine the character and texture and firmness of the soil beneath that pipe and I could not make any conclusion as to the character of the soil beneath that pipe except that it was a mixture of clay with a little sand and some loam. It was of a very firm texture and seemed to have a very substantial bearing power. That is as I know soils it was just soil, mother earth. Now where the dirt came from that was beneath that pipe I cannot determine by the knowledge I had. 20

Q. But you do not mean to indicate to the Court at all that the ground originally there was solid. You don't know anything about that? One way or the other? A. I was not there of course when the trench was dug through there. 30

Q. You spoke of this sixty-seven pound test. You said it was tested to sixty-seven pounds to the square inch? A. Yes.

Q. That was a test made on the ground that the pipe was in? A. That test was made in the ground. And I have said that there was no test made on that welded part before it was put into the ditch because I cannot say yes and if I could not say yes I said no.

Q. What I mean by that test of sixty-seven pounds to the square inch—the purpose of that test was to test the strength of the—at least the capacity of the joints so far as the leaking of that gas was concerned. It certainly was not primarily intended as test of the tensile strength of the joints? A. No test that could have been made either before or after the string was made without destroying the welds would have done more than that because any pressure or stresses we could introduce within that 40

pipe would have induced only small stresses in the weld. We would have had to have given that string of pipe other and special tests to determine its resistance to the forces, to the pressing down forces of the transverse pull.

Q. If the pipe had broken under that test it would have bursted out at the sides? A. Oh yes. The purpose of the air test was a tightness test.

Q. Now you have told me you intended to lay your pipe approximately straight, commercially straight was the way you put it? A. Commercially straight.

10 Q. And it was on the 18th of June when you found it, it was not straight, it was open on the level?

MR. SMITH: I do not think that is correct. As we understand the situation on the 18th of June it had been raised.

MR. WOODS: Well I am speaking as he saw it.

MR. SMITH: Oh perhaps I was thinking of February.

MR. WOODS: If that earth underneath that pipe that you intended to be straight had been firm compactly and solidly made would you have found that pipe cracked on the 18th of June? A. I do not know.

20 Q. Well what do you think? A. I know—well there are only a certain number of things that could have happened and I can say that if there had been underneath that pipe originally some seven or seven and one-half inches of loose unconsolidated backfill and there had been forces resisting that would have pushed that pipe down through that backfill and displaced it that that would be a cause for that pipe to have been found in the shape I found it.

30 Q. I do not think that quite answers my question. It is just repeating the conditions. What I am really asking you is you have told me you intended that pipe to be straight and intended to lay it commercially straight and on the 18th of June when you saw it it was not straight, it was bent down on a curve in the place we know. And I am asking you quite frankly with your knowledge of pipe engineering and laying if that backfill had been solid and properly packed and placed under the pipe would you have found that the way you did or would you not have found it straight in the way you expected it to be? A. If there were no other cause. If nothing else happened I would have expected to find it straight—yes.

40 Q. I understood you told me there were no specifications regarding welding because you did not expect to do much welding—am I wrong—in the specifications? A. No, you are right. We did not expect to do much welding.

Q. And you had a whole lot of dresser couplings. You told us you had a whole lot of extra ones over? A. We had as many couplings or

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

—
No. 50
Edgar G.
Hill
(Recalled)
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 50
Edgar G.
Hill
(recalled)
Cross-Ex-
amination
continued.

should have had, leaving aside loss and so forth, about as many couplings left over as we had twelve-inch welds.

Q. Did you do more welding, in point of fact, than you originally intended to do when you made the specifications? A. Why I would think we did, yes.

Q. Did you when you made the specifications intend to cross the streets by the coupling method with dresser couplings at the joints rather than welds in the same way as you had all the rest of your construction down the lanes where you used dresser couplings every twenty feet? A. That is a pretty hard question to answer what our intention was ten 10 years ago. I have never built a dresser pipeline without some welding and I cannot tell you what I contemplated there. I know I did not contemplate much when I bought the materials. Those materials were bought in New York before I came out and I bought a coupling plus for each joint of pipe because a system is generally contemplated—a dresser pipe system.

Q. It occurred to me from what you said to my friend in chief you did put in more welds than you originally intended and that happened at the street crossings under pavements and that what you originally intended was to cross the street under the pavement with dresser couplings but that you changed your design afterwards. Am I right? A. Well I 20 think that you are probably right. When we bought the materials in New York we bought them for a dresser system and any welding that was done outside of incidental welding, which always creeps in, was a result of change of plans here.

Q. And I think from what you have said to me, and perhaps I am wrong and I want you to correct me if I am, I would take it that in the light of the event that happened here, you would agree that at this place at all events it would have been better to have used the dresser coupling method—in the light of what we know happened? A. Well I presume that the logical answer would be yes. On the other hand, I want to finish 30 it—

Q. Yes. A. We do not know what would have happened in these eight and a half years had we used the dressers under the streets. I was looking through one of the—well I think the best recognized, the biggest authority on gas main construction, the other day picking through it in connection with alleged matters and I happened to see the proceedings of the Pacific Coast Gas Association was reported in Morgan's text book.

Q. I do not want you to take advantage of my question to run in a lot of evidence? A. You asked me a question in the light of eight and 40 a half years' experience. Well it is hard to make a guess. Generally speaking the majority of leaks in gas systems are rubber leaks and I do not know what would have happened on these street crossings here in town in these eight and a half years had we used the other construction. So it is hard for me to make an intelligent answer to your question.

Q. MR. SMITH: Finish the answer you started to make before you were interrupted unless his Lordship tells you not to? A. Morgan in reporting this leakage matter—

MR. WOODS: I do not think it is quite fair.

MR. SMITH: I don't know Morgan. It is the first time I have heard of him.

MR. WOODS: I know Hill but I do not want Morgan.

MR. SMITH: If there is some authority that may be of interest to the Court in this matter he should be permitted to give it.

10 THE COURT: If Mr. Woods does not want the completion of the answer or the reasons for the modified answer to his question to which he desired a categorical answer if he could get it, I won't compel him to take it. I think I understand what the answer means by his answers and I may say his answers seem to show a desire from time to time to be fair.

MR. WOODS: I have not suggested otherwise.

THE COURT: No, I know you have not. Because the witness has many times agreed with your theses—that is the theses in your questions.

MR. WOODS: Go ahead with your reasons, which you have not given, for your answer? A. I think I told you Friday the primary reason for using welding under pavements, that Morgan reporting on page 143-144 of his second volume of *Manufactured Gas Product* published in 1928 reported that out of the experience of one large gas company covering some 25,000 leaks approximately 21,500 were of rubber gaskets. So I do not know what would have happened during the intervening period had we not welded. It is pretty hard to make a guess of that kind.

Q. Is that the end of the answer? A. That is the end of the answer.

Q. Let me see if I understand what you mean by a leak in the gasket. Leaking from a dresser coupling in the street it would have required the gas company to have had a vent in the pavement that would enable such leaks to have come out or some form of gas escape? A. Yes. The gas would had to have gone somewhere.

Q. And the ordinary precaution in these cases is to have some form of hole in a pavement out of which the gas comes? A. That is if it is developed.

Q. You do not begin to suggest or to compare the kind of incidental leak from a rubber gasket or Dresser coupling of this kind with the kind of a leak we have had in this case? A. Oh this would be comparable to the blowing out of a section of a Dresser rubber of comparable length to

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 50
Edgar G.
Hill
(Recalled)
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 50
Edgar G.
Hill
(recalled)
Cross-Ex-
amination
continued.

that break in the pipe. That is, we will say we had a five inch crack in the weld, that would be comparable to a rubber leak around the circumference of that pipe about five inches long, that is, a rubber leak where the rubber had failed due to a displacement of the rubber, which might start a leak and the gas coming through might gradually eat that rubber away. That is not uncommon at all. That is, it tears the rubber and causes a space to occur between the rest of the rubber and the pipe and allows the gas to escape through that opening. It is a far different thing from the blowing out of an entire rubber. That would have permitted far more than the amount of gas I have heard about to escape from that joint. 10

Q. The kind of leaks through rubber couplings that you have mentioned and that you have stated are referred to by Morgan—the kind that they are there referring to is the leaks out of the rubber coupling where it is in place and not those big leaks due to a tear in the Dresser coupling to such an extent as we have the tear in the pipe in this case. A. Morgan did not define the extent—I would have no way, not knowing what Morgan meant by a leak, except an amount of gas—I do not know how many of these twenty-one thousand five hundred were big leaks or little leaks, but they were leaks. And my experience with couplings shows 20 they are a most excellent joint. On the other hand, they will leak, and they leak anywhere from little bubbling sizzles or pin hole leaks up to a major leak that is caused by the free or partial disintegration of rubber.

Q. But the thing you are referring to as the leaks you would expect to come from rubber couplings would be the possibility of a leak other than in a great big leak like this, a great big break like this? A. Well this was a break. It was a break that apparently permitted the one hundred and fifty cubic feet of gas per minute to escape. Now it would not be uncommon or difficult to assume, under certain conditions for a Dresser joint to fail to that extent. Now I do not want to give you the 30 impression or let the Court get the impression that it is a common thing. It is not a common thing. An one hundred and fifty cubic feet a minute gas leak of any kind is not a common thing but it is not beyond the possibility of a Dresser rubber. I can assure you that.

Q. But it would have to be subject to extraordinary stresses to have caused such a thing or it would have been a bad rubber in the beginning. One of those conditions would have had to be present. Whereas in the leaks you have been referring to which occur in small quantities out of the ordinary Dresser coupling out of the end? A. Well I do not know the range of leaks Morgan was referring to. But I do know that Dresser 40 coupling rubbers, particularly rubbers ten years ago, and there were good ones then too—were not infallible as we all in the business know, and I would say further that the failure of a Dresser coupling rubber might have been caused from an inferior rubber being moulded or from

a number of other causes that I can think of—uneven compression of the follower ring is a frequent cause of Dresser rubber failure.

Q. The ordinary small leak such as happens where none of these extra breaks occur, is a leak that is taken care of in the usual course by the gas company having a little vent in the pavement? A. Well, that is more or less the modern way of doing it, yes.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 50
Edgar G.
Hill
(Recalled)
Re-Examination

RE-EXAMINATION BY MR. SMITH.

Q. Mr. Woods asked you about the welders who were employed by Williams Brothers at the time of this construction. And you told me that
10 you knew two of them personally, at least you had known two of them before by reputation. Now I want to know whether or not you found out who the welder was who was on the intersection of the lane by Jasper and 107th Street? A. Yes, I have found out beyond a reasonable doubt.

Q. Who is he? A. A. M. Hornall.

Q. And what was he as a welder? A. By reputation a conscientious competent man.

Q. And has he gone further in the business? Is he alive today? A. He has and is. He is now president of the Southwest Construction Corporation specializing in welded pipelines, Tulsa, Oklahoma.

20 Q. Now about this quarter inch casing being as strong as the pipe. Insofar as the pressure of the gas on the lines is concerned, what thickness of pipe would carry that pressure? A. Probably half the thickness of pipe we used.

Q. There is no question whatever a much heavier pipe was used than was necessary to carry the pressure, on account of stresses and strains where that pipe was being used?

MR. WOODS: I object to the question.

THE COURT: Because it is leading. Of course it is leading.

30 MR. SMITH: Oh it was. There is no doubt about that. All right, I won't lead then. I listened to two weeks of it and I thought it would be all right for me to do it for a moment.

THE COURT: But if it is objected to—

Q. MR. SMITH: Will you tell us whether having or not put a quarter inch pipe to carry a pressure which could be carried in pipe half that thickness, what the object was in putting quarter inch pipe in the ground in this city in a twelve inch line? A. Well, to provide a factor of safety against other forces and internal pressure, the ordinary effects of corrosion is one of them.

40 Q. And corrosion is what? A. It is the eating away of pipe metal by external forces other than the gas within the pipe.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 51
Edgar G.
Hill
(recalled)
Re-Examination
continued.

Q. Among which may be what? A. Well, electrolysis is one. I think all corrosion except plain rust is now considered to be electro-chemical.

Q. Mr. Woods has been asking you about vents in pavements. When did the idea of venting pavements and drilling holes — when did that become or has it yet become a common practice in gas distribution systems? A. It is not a common practice today.

Q. When did it start? A. I could not say. I don't know.

Q. Was it one, two years next month? A. No, it was not a common practice.

MR. WOODS: The word "electrolysis" was used for the first time 10
in this trial. Do you suggest or is it suggested on the part of the gas company that there was any such element present at this place? A. I saw no evidence of it.

No. 51.

Evidence of Oscar Walter Schultze.

No. 51
Oscar
Walter
Schultze
Examination.

OSCAR WALTER SCHULTZE, being called as a witness on behalf of the defendant and having been duly sworn was examined by Mr. Smith and testified:

Q. Have you any experience in the laying of pipelines? A. I have been working at it since 1888 and I have a little experience at it. 20

Q. And that includes gas pipelines? A. Yes, sir—mostly.

Q. You came to Edmonton in 1923? A. Yes, sir, about the 22nd of July, I think.

Q. And who did you work for? A. For the Northwestern Utilities. I was sent up here by Mr. Johnston.

Q. And you saw Mr. Hill? A. Yes.

Q. And you went to work in his organization? A. Yes.

Q. As what? A. As chief inspector.

Q. How many inspectors did you have under you? A. I think ten or eleven. 30

Q. And do you know who was inspecting at the crossing at the pipeline lying back of Jasper and over 107th Street? A. His name was Fred Forbes.

Q. Where is he, do you know? A. I understand he is dead.

Q. Well what sort of an inspector was he? A. Well he was a good man. He was the best man I had. That is the reason I put him on that big line.

Q. Had he previous experience? A. He was inspector on the High Level Bridge for the railroad company, so he told me.

Q. Were you present or did you personally inspect the work in the crossing of 107th Street of this twelve inch line? A. I expect I did. I always inspected the crossings that was made.

Q. And did you sign reports with respect to the work? A. Yes.

Q. And do you know where the Corona Hotel is? A. Yes.

Q. And where this crossing is? A. Yes.

Q. And did you look over the trenches and tunnels before and after the pipe was put there on 107th Street? A. Why generally through tunnels to see whether they were level on the bottom.

10 Q. Did you at that street crossing? A. Yes, sir.

Q. And was the tunnel and trench level across 107th Street when that pipe was put in?

MR. WOODS: I submit my friend has not laid the foundation with respect to these questions.

Q. MR. SMITH: Had you had previous experience in inspecting the trenches for the purpose of lining pipe? A. Yes, sir.

MR. WOODS: I mean factually the witness says "I expect I did." He has not deposed to sufficient before the Court to justify my friend in asking whether he did see the bottom of that trench on 107th Street.

20 There was another man who was inspector there and he has told us who it was. I submit he has not laid the foundation.

MR. SMITH: He said he personally inspected all street crossings.

THE COURT: Well the force of the evidence would be much better if by possibility there is something from which he can refresh his memory. His answer, of course, made twice, would indicate that he was giving his evidence with regard to this particular place by reason of a memory of a general practice of inspection by him, and not having relation to the particular place.

30 Q. MR. SMITH: I am showing you two pieces of paper and I am asking you if you will look at them and let me know if that is your signature on either one? A. Yes, sir.

MR. WOODS: I have not seen these papers. They have not been produced as far as I know.

THE COURT: Are you intending to use them to refresh the witness's memory?

MR. SMITH: They were exhibits on the examination of Julian Garrett. My friend said they were not produced.

MR. WOODS: I object to the use of them. It appears to me to be signed by somebody whose name is Schultz.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 51
Oscar
Walter
Schultze
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*
—
Defendant's
Evidence
—
No. 51
Oscar
Walter
Schultze
Examina-
tion.
continued.

THE COURT: Did you make reports of your inspections? A. Yes, sir.

Q. And were the reports made shortly after the inspections were made? A. They turned them in and I had to sign them.

Q. Were they the same day or the day after the inspection was made? A. Well I don't recollect that. This is for the work done on that street up there.

Q. If you had your reports would it refresh your memory—would you be able to say whether you made an inspection of this particular street crossing? A. Well I was there, I am sure. I can cite an incident, 10 it is a little comical, that I know I was right there when the work was put in. I would rather not say it.

Q. Because of some comical incident you know? A. Yes.

MR. SMITH: Perhaps you will tell us what the incident was. A. Well I can say it is nothing bad about it.

Q. You had better tell us? A. Well, Mr. Murphy, the man that took my place afterwards, a few days after we put this crossing in as far as 9th Street, he stayed at the Corona Hotel and he was acquainted with the cook there and the cook was baking pies and Mr. Murphy asked the cook to give him some pies, and the cook brought out three or four pies 20 and everybody was eating pie while we were putting that crossing in.

Q. And did you inspect that? A. I looked through the ditch, yes.

Q. And was it level? A. Yes.

Q. Did you permit anyone to lay pipe in that ditch or in any other ditch which to you was not level? A. No, sir.

Q. And had you had much experience in lining up ditches to tell whether or not by your eye, whether they were run on level? A. Well if you dig a ditch on the street, if I walk on top I can tell whether it is low or high but in a tunnel I generally jump in the ditch to see whether it is level or smooth. 30

Q. Did you make a test of any welds? A. No, sir.

Q. Do you know the gang who dug that ditch? A. I think it was Webster & Jackson.

Q. What sort of men were available for ditching and tunneling? A. Well they were mostly men from the coal mines who knew how to handle a pick and shovel.

Q. And after the pipe was hauled through I want to know what was done with respect to backfilling the cuts in the tunnel? A. Well my orders was to fill them in.

MR. WOODS: I object. I do not think that what his orders were 40 is an answer that should be given. A. They were filled in.

THE COURT: Do not tell what your instructions were. It is results Mr. Smith wants. A. They were filled in round the pipe and tamped with two by four's.

MR. SMITH: You mean two by four pieces of wood? A. Yes, long pieces, and we tamped it where the space was narrow and we could not get in with the tamper.

Q. And what was done after that in the way of tamping? A. After the ditch was filled it was flushed with water.

Q. And who supplied the water? A. We had a man hired from the City. He was paid by the City and he had a one horse waggon and a lot of hose on it and he was working for the City and he had the key and the contractor paid the City for him.

10 Q. And under those streets were those trenches water flushed from his car?

MR. WOODS: I understand my friend was referring to this particular crossing and the questions were directed to that. Now I may be wrong on that. I would rather surmise from the last question that the previous question referred to the general practice of backfilling throughout the city and that I object to as not being competent to give.

20 THE COURT: I rather gather that what the witness means is that he said he did inspect and do these things with regard to all of them and for that reason he can include this particular place without any particular memory of this place at 107th Street, beyond what he says he has. It may be that his reason for stating the incident that happened, that he intends me to understand that he remembers more about the particular place. It is just the kind of thing that happens so frequently with witnesses of this type. I thought at first he was arguing himself into a memory of this particular place, but from his subsequent answers I am not so sure of that.

30 MR. WOODS: He is now on another subject, the tamping and the backfilling, and that I take it is his answer as to his general practice throughout the city and he may say—having done it throughout all the city “I do not see any reason why I should not have done it here”—but that is not evidence we should be called on to meet.

THE COURT: The effect of the evidence may be very different having regard to the impression I may get from the witness's answers as to what his memory or his ability to speak is.

MR. SMITH: I will clear it up just as well as I can. When did you get to Edmonton on this trip? A. I got here last Friday morning.

Q. And where did you come from? A. Huntington, West Virginia.

40 Q. What method of transportation did you use to come? A. I came on the train from Huntington to Chicago and I intended to go to Winnipeg by airplane and come up here by train and a blizzard stopped me in Fargo and I came by airplane from Chicago to Fargo and then we could not go any further and I changed around on the Great Northern and came up here from Coumts.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 51

Oscar
Walter
Schultze
Examina-
tion.

continued.

Q. When did you receive the message to come up here? A. Monday after dinner about two o'clock. They asked me if I could come. I told them I could not come and I got another telegram and then I left at midnight.

MR. SMITH: There are two things open to me. One is to ask the witness about his memory of this particular place, and another is to ask general questions as to what the work was they were doing and what might be requested—system, in other words.

Q. Do you remember this particular street crossing with respect to the water flushing? A. Yes, sir. Not exactly the same crossing but the man that takes orders from me. 10

Q. Was it planned to have this cart water flush these trenches under all crossings in this city?

MR. WOODS: I object to that.

MR. SMITH: As I understand you you do not remember this particular crossing itself? A. No, sir.

Q. As to water flushing? A. No, sir.

Q. Did you have anything to do with the inspection of the testing of the twelve inch line? A. I did all the testing.

Q. And you might tell me what tests this twelve inch line was put to? A. Well on the south side we tested to seventy-five pounds, that is the twelve inch, and the low pressure was to twenty-nine. And we came across here on this side and we pumped up to seventy-five, we tried to get seventy-five, but could not get it on account of a few rubbers that were out, until we found them, and we tested from one gate valve to another and finally came to a point where we could not pump up seventy-five pounds and could only get about sixty-seven or something like that and we concluded we would turn gas in. And we turned the gas in from Bonnie Doon and then fire tested the lines every five feet, that is running a bar down and having a flush light made by a wick and coal oil. And after, we turned the low pressure in and tested that to twenty-five pounds. 20

Q. Now with respect to your experience in having men digging trenches. Do not answer this question until his Lordship says you may—have you had much experience with men digging trenches, that is hand digging? A. Yes. 30

Q. And what is the thing that people do naturally? Do they dig up or do they dig down from level?

MR. WOODS: I am not objecting to the question as it stands. 40

MR. SMITH: From your experience with men are they inclined to dig up from the level, could they or are they inclined to go below? One minute.

THE COURT: I have heard no objection?

A. Well in digging a tunnel when men get in I have never found they went below, myself, but always went up and we always had to lower it and level it after the tunnel was broke through.

At 12:25 Court adjourns till 2:00 p.m.

At 2:00 p.m. Court resumes.

MR. SMITH: If Your Lordship pleases, before we proceed. It has been called to my attention by Mr. Hill there are one or two matters in which there may be some misunderstanding and in order to let him go
10 away tonight I would like to recall him and have his explanation.

THE COURT: Any objection, Mr. Woods.

MR. WOODS: Oh no.

No. 52.

Evidence of Edgar G. Hill (recalled).

EDGAR G. HILL (recalled) was further examined by Mr. Smith and testified:

Q. You told me at noon there are one or two points on which you thought there might be some misunderstanding between my friend and yourself. Just clear that up? A. The first point was the reference by
20 Mr. Woods to what I understood he meant to be the flash holes which the gas company here, as I understand, drilled in the streets through the paved streets. As I recall it he referred to them as vents or vent holes. They are of course not vents unless the plugs are moved from the openings of the pipes that are inserted at these holes at the time of inspection. Otherwise, they are in no sense vents. I know of no gas company anywhere which has actual vents installed in the pavement over its mains.

Q. What would you have to do to put a vent in it? A. You would have to run a pipe laterally from the point on top of the main to the side
30 of the street and bring it up in vertical position on a telephone pole or lamp fixture or some other vertical riser to get it up where it could be inspected periodically and formed in such a way that no water could get into it.

Q. It would need to be above the ground? A. Yes.

Q. And the other? A. The other was in connection with the welding construction in the slough on the main line to which I testified and

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 51

Oscar
Walter
Schultze
Examina-
tion.

continued.

No. 52

Edgar G.
Hill
(recalled)
Examina-
tion.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 52
Edgar G.
Hill
(recalled)
Examina-
tion.
continued.

when I spoke of the brick construction being held relevant or at all relevant to the construction under 107th Street as far as earth stresses and contraction stresses are concerned, I did not mean in my answer to include the construction in the sloughs, because to my mind construction in the sloughs carries in an exaggerated degree the characteristics of earth stress as earth action due to temperature contraction and also illustrates—would be illustrative of the phenomena of a downward jacking action of pipe to a great extent if such a phenomena existed in this country. The slough before we put the pipe in was dry or reasonably dry. That is, there was no standing water in it. The ditching machine went through the slough and cut the ditch. Afterwards the rain and snow came, a morass of the ground. The top of the ground was covered with water and the ditch was filled with water and naturally the sides and bottom of the ditch were soft and when we put that pipe in there by floating it that is by hauling up a long string and floating it over the ditch and filling it with water and sinking it and putting sand bags in it enough to hold it down and then blowing the water out. The next summer we finished the backfill. But during that winter the freezing action was present in that trench. The frost level undoubtedly went down several feet in the ground and our pipe only had from sixteen to twenty-four inches of cover so any frost action that was certainly present in that pipe and any water around that pipe would have been frozen solid. After the pipe was finished—backfilled, all these phenomena with perhaps a lesser effect of water would be in evidence the second winter at the latest. By the second winter we had a filled ditch. The first winter we had a wet ditch, the backfill consisting of sand bags. 10 20

Edgar G.
Hill
(recalled)
Cross-Ex-
amination

CROSS-EXAMINATION BY MR. WOODS.

Q. The thing I had in my mind was the illustration you gave of that pipe when it was on top of the water and before you had taken the water out from the pipe after you filled it with water in the summer. That is what I referred to as analogous more than the braces on the bridge as to a pipe in frozen ground. I understood you agreed with me in that position it was not an analogous condition to the pipe in the ground. A. No, in no way because at that time it had no gas in it and was simply a cylindrical tube filled with water resting on the bottom of the water filled ditch. 30

Q. And you filled it with water and put sand bags on it and sunk it into the trench on the bottom of the slough. That is right, isn't it? A. That is right. 40

Q. Suppose you put all these sand bags in the middle of that pipe and sunk it, wouldn't there be a tendency to bend more at that point than at any other point in the pipe? A. If we had confined all our backfill to the middle?

Q. No. Not the backfill. Of course our sand bags—from one end to the other you have the pipe at intervals. Suppose you had them all concentrated in the middle, wouldn't it have made that pipe sink in the middle? A. The tendency would have been to sink in the middle where the gross weight was more than at the ends where there was no weight.

Q. And it was a long pipe as you had it there. How long? A. Between three hundred and six hundred feet in length.

Q. And if it sagged the sag would be taken up by three hundred to six hundred feet of pipe instead of as in this case eighty feet of pipe?

10 A. Well the sag probably would not have been a uniform sag.

Q. No, but it would be scattered from one end to the other of the pipe—distributed? A. I question very much whether the way that pipe was weighted down with sand bags would cause any regular or uniform deviation from the straight line. If it deviated it would have deviated depending on the condition of the ditch, the hardness or softness of the ditch and the muck and the uniformity with which the sand bags were placed.

Q. But the deviation would be spread over six hundred feet of pipe instead of over eighty feet of pipe? A. That is true.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 52

Edgar G.
Hill

(recalled)
Cross-Ex-
amination
continued.

20

No. 53.

Evidence of Oscar Walter Schultze (recalled).

OSCAR WALTER SCHULTZE (recalled), was further examined by Mr. Smith and testified:

Q. I have my friend's leave to ask one question which I forgot. Carrying your trenches or tunnels underneath paved streets in Edmonton did you at any time run into a soft spot? I mean a spot where you thought the ground would not support your pipe? A. No, sir.

MR. WOODS: I have made my general objection to any evidence being directed except at this point.

30 MR. SMITH: I take it you have already ruled on that?

THE COURT: Yes.

CROSS-EXAMINATION BY MR. WOODS.

Q. You were the general inspector over the whole system? A. Yes.

Q. And Mr. Fred Forbes and Mr. Freeman were the inspectors under you? A. Yes.

No. 53

Oscar
Walter
Schultze
(recalled)
Examina-
tion.

Cross-Ex-
amination

Q. How many more were there? A. Eight or nine more. I cannot recall them.

Q. And am I right in suggesting to you that each night these inspectors would hand you in their inspection reports? A. Yes, sir.

Q. Each night? A. Yes, sir, they all come together at nights.

Q. So Mr. Freeman would hand you in this inspection report on the night of the 17th August, 1923? A. I expect so. My signature is on it. They surely must have handed it in.

Q. That report would be handed to you by Freeman that night of the 17th of August when you all came together? A. Yes, and I signed it. 10

Q. And did you put your name on that report at the time or later? A. I put it on in the evening before we quit the job.

Q. I may have misunderstood you; but I understood you to tell the Court that Mr. Freeman would hand you these in when you all came together at night in your office or in some office, after the work was over they would hand you in their inspection reports and Freeman would hand you this particular paper on the night when they all came together. Am I right? A. He did not hand it to me. He put it on the desk of Mr. Cowan. 20

Q. And that is the first time you saw it? A. No, sir. I said a minute ago I would sign them on the job.

Q. Do you remember signing that paper on the job? A. I don't remember just exactly that one paper, but I always signed them on the job.

Q. You signed none of these papers in your office after the day's work was done? A. I would not say I did not sign any of them because some days I did not see certain of the inspectors because at quitting time I could not be all over the city at the same time.

Q. That is what I should imagine. And in these cases, at all events, the inspectors would bring the inspection reports in and you would put your name on them at night? A. Well one night when I would not be there they would put them in to Mr. Cowan. He was general superintendent. 30

Q. And that would be true with regard to Mr. Fred Forbes? A. Mr. Fred Forbes—I signed his on the job.

Q. But you have no personal memory whether you signed these two papers on the job or in your office? A. No.

MR. SMITH: I tender the report of August 17, 1923, as Exhibit 78, and that of August 18, 1923, as Exhibit 79. 40

Inspection Report August 17, 1923, marked Exhibit 78.

Inspection Report August 18, 1923, marked Exhibit 79.

No. 54.

Evidence of George Barner.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence
—

No. 54
George
Barner,
Examina-
tion.

GEORGE BARNER, being called as a witness on behalf of the defendant and having been duly sworn was examined by Mr. Smith and testified:

Q. What were you doing in the spring of 1931? A. That is the same spring the sewer was put in.

Q. Were you working on this overflow sewer? A. Yes. I was foreman for a while and then put back on the weirs—the overflow.

10 Q. Were you foreman when this sixteen inch tile sewer was laid beneath manhole "A" and manhole "B" at the corner of 107th Street in Edmonton? A. Yes.

Q. And did you build this weir chamber at manhole "A"? I am calling "A" the centre manhole and I am calling "B" the new one that was built. And did you actually build this weir chamber in the side of the centre manhole? A. I saw the bricklayer lay the wall and I put the roof on.

Q. Did you break through the side of the chamber to put that weir chamber in? A. Yes.

20 Q. And had this pipe been laid between the manholes and had the trench been filled? A. It had.

Q. So there is no doubt at the time you broke through this centre manhole to build the weir chamber this pipe had been laid and the trench filled? A. Yes.

Q. They built several of those overflows in connection with that job? A. Yes. I put them all on 107th Street myself and the year before I think it was.

Q. Do you as a matter of fact know how this pipe was laid? A. Well they are always laid up hill.

30 Q. And were you foreman on the job when this particular one was laid from the new manhole to the old one? A. I would be foreman but I don't remember it. You see there were three shifts on in the twenty-four hours.

Q. But do you know the system, did they lay them from the manhole to the centre? A. Yes.

Q. And backfilled them? A. From the old one down.

Q. And when you opened this it was already backfilled? A. Yes.

Q. Which was it backfilled from? A. This one.

Q. That is the new one you speak of? A. Yes.

40 CROSS-EXAMINATION BY MR. WOODS.

Cross-Ex-
amination

Q. That is your signature (produced)? A. Yes.

Q. And that is your report to the City Engineer of your work on this matter my friend has been speaking to you about? A. Yes, sir.

MR. SMITH: What is the date, Mr. Woods.

MR. WOODS: It is not dated.

MR. SMITH: May I look at it?

MR. WOODS: Yes. I will read it to you and see whether this covers the matter: "Referring to the connection that was put in on the first lane south of Jasper on 107th Street. This connection was cut out, a brick wall was built and concrete was run in between the brick wall and the clay wall. No gas mains were seen and no caves were made. The roof was put on with six by eight inches of concrete tight up against the clay." 10

MR. SMITH: Before it is used I would like to know who it was made by and when.

MR. WOODS: It was made by Mr. Barner to the City Engineer's Department.

THE COURT: I was wondering what right you had to put it in without it being agreed to.

MR. SMITH: I do not know what it is and I want to know when it was made and even then I suggest it should not go in as an Exhibit.

THE COURT: I did not hear it tendered and I do object to documents being handed to the clerk without my hearing it. The reason I 20 insist on that is to give the other side a chance to object.

MR. WOODS: Well then I tender the document.

THE COURT: What right have you to put it in? You might examine on it.

MR. WOODS: I tender it on the ground of this man stating it to be his report to the City Engineer.

THE COURT: Then upon what principle are you claiming to put it in?

MR. WOODS: It was made by an employee in the usual course. It is the usual report to his employer. 30

MR. SMITH: My information is that is just what it is not. It is something made at least a year later.

MR. WOODS: I would have thought that a document tendered by a witness for the other side and signed by him stating a short statement of what he did was evidence for the Court.

THE COURT: I put it to you yourself whether or not you may at the present time use that document as evidence against this defendant.

MR. WOODS: It seems to me if a witness for the other side signs something in the course of his duties and submitted by him it is evidence that I may use.

*In the
Supreme
Court of
Alberta*

THE COURT: You may cross-examine on the information you got from it and you can ask him to read it and you can ask him if the facts stated there are true and so on. You know as well as I do how to do it; perhaps much better.

Defendant's
Evidence

No. 54
George
Barner,
Cross-Ex-
amination
continued.

Q. MR. WOODS: Just generally, that statement that I have read to you is a correct statement, is it? A. Yes.

10 Q. Signed by you? A. Yes.

Q. And when would that be made by you to the City Engineer's Department? A. I cannot tell you the date right now, myself. I could not remember.

Q. But how long after the job was through? A. Oh I could not say. I have not thought much about it, really.

Q. Tell me this. Let us get the explanation of it. "Referring to the connection that was put in on the first lane south of Jasper on 107th Street. This connection was cut out." Do you mean the connection between manhole "B" and manhole "A"? A. I mean all I done was to cut

20 out at the weir chamber.

Q. So that the connection there means the connection at the weir chamber between manhole "A" and the pipe leading from manhole "B" to manhole "A"? A. That was in when I opened the wall up to build the weir.

Q. And that connection was cut out. That is to say, you excavated to make the weir chamber, did you? A. Yes.

Q. And a brick wall was built. Now which is the brick wall? A. That would be the brick wall there (indicating).

30 Q. Which is the brick wall? Is it the whole of the chamber? A. The bottom is concrete and the wall is brick and the roof is concrete.

Q. So the brick wall you refer to is a brick wall of that weir chamber protuberance on this exhibit but the top is concrete and the bottom of it is concrete? A. Yes.

Q. And then the concrete was run between that brick wall and the clay wall—that was the place you excavated? A. No, that was all built together. The brick was in a crevice and they put the concrete in as they built it.

40 Q. It was first a brick wall and then the space between the brick wall and what was inside the brick wall? A. Well the open space. There was nothing in there.

Q. Well where was the concrete run? A. The concrete was run on the roof. Of course the floor was put in before the brick wall was built.

Q. But what I want to get at is this "and concrete was run in be-

tween the brick wall and the clay wall." A. Well that was really put in as we built it. The concrete was run on the roof. That is the only running we done of concrete.

Q. And the next sentence is "no gas mains were seen." You did not see any gas mains? A. No. I did not see any gas mains.

Q. And no caves were made? A. Not there.

Q. Are you pretty sure of that? A. Pretty sure when the weir was built.

Q. And the next sentence is "the roof," which I understand is the concrete roof of the weir chamber. A. Yes. 10

Q. "Was put on with six by eight inches of concrete and it was tight up against the clay above it?" A. Well it was tight filled with dirt—a little space that was left.

Q. How big was the little space left? A. Oh about six or eight inches.

Q. And what was that backfilled with? A. Clay.

Q. And was the backfill carefully put in? A. Well tamped.

Q. And are you quite certain in your memory that concrete was as you have described it here, right up against that tamped clay? A. Yes, we tamped it right on the concrete you will see; right over the top of it. 20

MR. WOODS: I will put this in if my friend will consent to it.

MR. SMITH: I will be glad to consent to it.

Report of Barner re construction of weir, marked Exhibit 80.

MR. SMITH: The City Engineer can tell me the date?

MR. HADDOW: I am not sure of the date but reports from other men are dated March 1932. So that is the nearest I can give the date.

No. 55.

Evidence of Eric Harold Ewertz.

ERIC HAROLD EWERTZ, being called as a witness on behalf of the defendant and having been duly sworn was examined by Mr. Smith 30 and testified:

Q. Where do you live? A. Elizabeth, New Jersey, U.S.A.

Q. And what professional qualifications have you? A. Graduate mechanical engineer.

Q. Whereabouts? A. Sweden.

Q. When did you come to this continent? A. Eighteen ninety-three.

Q. And generally in what business have you been engaged since you came to the United States in 1893? A. Ship building.

Q. And have you been dealing with steel and with iron? A. Yes; ships are built mostly out of steel and iron.

Q. And what experience have you had in the building of ships? A. I have been working on ship work from the standpoint of a mechanic, a draughtsman, supervisor and general manager.

MR. WOODS: If your object is to qualify Mr. Ewertz in connection with welding I am quite content to accept it that he has all the qualifications of an expert on welding.

MR. SMITH: That is satisfactory.

10 Q. Did you at some time in your career devote your whole time to welding? A. I did.

Q. When? A. In 1927.

Q. And prior to that had you been interested in the business of welding? A. Yes, since 1912.

Q. And did you belong to or were you an officer of an organization having to do with the art of welding? A. Yes, I have been president of the American Welding Society, Chairman of the New York Section of the Society, and Director of the Society for a great many years, chairman of a good many committees and member of a lot of committees and
20 then active in that work since 1912 and on.

Q. Now I want you to give me the history of the art of welding if you will. We are here dealing with a job that was done in 1923. I want you to give me a history of it and in order that it may be of some assistance to his Lordship in coming to a conclusion as to the state of the art at that time? A. At the time that I started considering the use of welding in 1912 there was relatively little or nothing known about the art except by a few people who were connected with electric machinery manufacture as well as concerns that were making and selling oxygen and acetylene gases. But the general knowledge in the trade or in the
30 engineering profession was very limited. It was further advanced in England than it was in the United States at that time. But a new art like welding with the vast possibilities connected with it was natural to attract the attention of a great many engineers as soon as some information was available. Therefore the early practice of its adaptation was relatively fast. We got up to the period of the World War where labor was scarce and where training of mechanics was reduced to the minimum and the use of welding offered another opportunity of another trade to be introduced which would permit the joining of metals. Unfortunately, while welding seems very simple and the minor operations are
40 very readily learned the actual knowledge of welding was far from understood or we had very little knowledge of it; that is knowledge of the nature of the welding. The consequence was that a great deal of work was being done during the early years that was far from satisfactory. And the reaction from that was the formation of a welding

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Examina-
tion.

continued.

society where we could study and learn how to properly apply this new art to save construction. The re-action from the rather sad experience that we had during the World War worked against the further use or the extensive use of welding after the war was over and for quite some time it was extremely difficult to get an engineer to permit welding to be used. In 1915 the oil companies started in to use welding for their oil lines. And they displayed more care in the use of this new art than was general in the work of the other engineering activities. They made more real progress than we had even made in the welding in connection with ship construction. And the oil companies felt that their information on welding was so much more complete than some of the rest of the engineering fraternities that they even declined to have the welding society draw up codes for how pipe welding should be done. They felt they could do it better themselves. And I do not know but what they were right. It was only about 1925 or 1926 when welding again became generally accepted and there again it was probably due to the fact that we were beginning to go into a period where the question of costs was of great importance and if we could reduce the cost without destroying the quality of the goods we were manufacturing it was the ideal thing to do at that particular period. And therefore welding started to go forward at a very high rate of use so that today even in the depressed condition that we find ourselves in in the United States it is estimated that we have over 300,000 men working as welders. I do not know if that is all you want to know.

Q. Yes. Now what constitutes a good weld? A. Well you cannot write a specification for a good weld without knowing what the weld is to be applied to.

Q. Well you spoke of the writing up of codes. Are there such codes in existence? A. Yes, we have codes for structural steel welding. We will have shortly a code for pipe welding.

Q. Had you something to do with its operation? A. I am sorry to say I had. It took a lot of time.

Q. What were you? A. A member of the structural committee—a member of the Executive Committee and helped them raise money. We have codes for pressure vessels, for boilers, for tank construction, and we have a great many under way at the present time that shortly will be out and each one has a description of welds as will be acceptable under such code.

Q. You heard some figures given by Professor Morrison with respect to welds here. That is the welds lying on either side of the broken weld? A. Yes.

Q. And you heard him work out that the weld had a strength of fifty-one per cent. in the one case and in the other case fifty-three per cent. of the pipe strength? A. Yes.

Q. And those figures on which he was relying had been available to you for some time? A. Yes.

Q. And the photographs that he put in, namely, Exhibits 44, 45, 46, 72, 73—well the photographs have been available to you for some time?

A. Yes.

Q. And Exhibits 66 and 67, you have seen since you came to Edmonton some weeks ago? A. Yes.

Q. And 68, which was removed from another Exhibit the other day? A. Yes.

Q. And I had overlooked Exhibit 65. And Exhibit 42, being broken portions of the actual weld has been available to you? A. Yes.

10 Q. And this larger one, number 43, has also been available to you and you have had an opportunity—you not only have had the advantage of the figures which Professor Morrison gave but the advantage of looking at these photographs and the various exhibits to which I have called your attention? A. Yes.

Q. And do you agree with the figures of fifty-one per cent. and fifty-three per cent. which Professor Morrison gives? A. I do not.

Q. And what in your judgment should that figure be? A. It actually figures out about sixty-eight and one half per cent.

20 Q. And would you mind showing to the Court why you disagree with the figure of fifty per cent. and substitute yours of sixty-eight per cent.? A. You want me to explain why those figures of Professor Morrison's and mine do not check?

Q. Yes, exactly. A. The pipe weld such as found on the specimens exhibited lacks penetration, judging by certain codes—certain code requirement. It does not lack penetration from the standpoint of other codes in existence. When specimens were cut out of the pipe and put through the test, they followed the requirements laid down for tensile specimens in connection with plate work. There is no code available today as to requirements for testing of specimens for pipe. When a specimen, such as used here, is put in the testing machine the weld metal laid on the outside of the joint together with the unfused section and the inner surfaces of the two pipes makes necessary the stresses that go from one end of the specimen to the other to depart from a straight line and take a curve upward and downward through the metal.

Q. Will you show his Lordship on this exhibit what you mean. A. I think I can show it better by a picture or sketch (produced).

40 Q. You have in your hand a sketch? A. Yes, sir, shown as specimen with a joint with heavy reinforcement on the outside and unfused section between the two inner edges of the pipe. When that is put in the testing machine, the position of the specimen becomes what is shown in the sketch below. On account of the stresses going up through here it bends the specimen in, so that you get somewhere near a straight line through the centre of the weld and the centre of the two ends of the specimen and in doing that, this unfused section on the inside opens up like a "V" and becomes a crack that eventually penetrates the weld metal.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Examina-
tion.

continued.

Q. You spoke of the whole not being a straight line. You mean your line goes through the metal and up through the weld, down again, and continuing along in that way? A. Yes.

Sketch of weld showing stress line, marked Exhibit 81.

Q. Now I think you have made a model which you have with you and which either will or will not illustrate the point you have made? A. It illustrates it as well as you can illustrate anything by making a piece of pipe out of rubber. That is the section of the specimen (indicating) and this is the weld on the outside and in there is a solid cut to represent the unfused section of the inner surfaces of the pipe. This end is fastened. When I pull here I do the same thing as the testing machine would do and you will notice these rubber pieces in that way and the specimen opens up in the form of a "V". If you put that piece in there (indicating on wood) and prevent the specimen from bending in, you do exactly what happens to that specimen in a piece of pipe relative to the rest of the pipe. That is, the adjoining section to this specimen in the pipe tends to keep the particular section from bending. And when you pull here now you get a different form of opening in the slot. It is not as much of a "V". It is more of an even parallel opening but it takes more pull than it would take the other way to bring it up to the point where it would tear. 10 20

MR. SMITH: I am tendering that as an exhibit.

**Model with rubber showing effect of stretching welded pipe,
marked Exhibit 82.**

Q. I also want to know whether you have at places other than here conducted experiments which to your mind justify the conclusion to which you have arrived? A. Yes.

Q. Where, and what have you done? A. There have been two experiments carried out, one on a twelve inch pipe in the laboratory, New York, and one on the sixteen inch pipe in the laboratory in Pittsburgh. The phenomenon that is involved in these was discovered when the pipe was tested as whole pipe. The strength of the weld metal was very much greater per square inch than we had found from specimens cut from pipes. And it was obvious there was some reason why this discrepancy existed. So we made a test in the laboratory in New York by taking two plates, a quarter of an inch thick, welding them together, with about the same reinforcement as we have on the weld in question here and then we cut a space on the bottom to the depth of half the thickness of the material in order to reproduce as near as possible the conditions as reported to me and found on these various photographs. Several specimens were cut from this plate. Half of them were pulled as the specimens were pulled up here and the specimens allowed to bend due to the off-set 30 40

stresses and then the other half of the specimens we pulled by putting a backing-up strip on the inside of the specimen, preventing it from bending but not interfering with its motion. And it was determined that the frictional stresses exerted on a specimen due to the backing-up strip of the clamps that held the two pieces together was less than one thousand pounds per square inch. When these specimens were tested it was found that the free-to-bend specimen relative to the restricted specimen had a very big difference in strength. The "back-up" specimen pulled thirty-four and seven-tenths per cent. more than the free-to-bend specimen. On
 10 the test we made in Pittsburgh we went through practically the same process only we were dealing with a sixteen inch pipe and slightly heavier material than we have here. But the results checked with a margin of one and one-half per cent. That is, the specimens pulled in Pittsburgh showed about thirty-five per cent. more of strength when it was backed up as compared with one when it was free to move. From those specimens I naturally computed the stresses as had been made in the Alberta College and I found that the weld material was sixty-eight and one-half per cent. the strength of the pipe metal. However, that is only the metal per square inch—one compared with the other. It does not mean that the
 20 joint had that relation.

Q. Is that sixty-eight and one-half per cent. a comparable figure with a fifty-one and a fifty-three? A. Yes. I should tell about another discrepancy in the figures that I corrected, which had a slight bearing, but very slight bearing, on the final result. The specimens that were broken when they broke had a given pound stress—that pound stress was the strength of the part of the specimen that actually broke. In other words, if a specimen showed a breaking strength of twenty thousand pounds, in order to arrive at its strength per square inch, you must take the area of the broken specimen in the way of the surface that actually broke and
 30 use it to compute the strength per square inch, and in taking the area of the specimen including the unfused section which obviously had no part in the break. It had no strength and therefore could not add to it. So that therefore those figures are corrected.

Q. I am showing you Exhibit 76. Will you illustrate to his Lordship on Exhibit 76 what you mean by reducing your poundage? A. The area that was broken is that there, that you see highly bright. The area below that bright surface is a dull surface. That was never welded. Therefore, it obviously did not either add to or subtract from the strength of the joint. So when we get the strength we figure the area of the broken part and
 40 use that to compute the total strength per square inch of the weld pull.

Q. And what is the result of that situation? A. Well, I could not tell just exactly what it was in percentage, but it was a relatively small correction.

Q. Would it increase or decrease the per square inch? A. It increased the square inch in the strength of the weld pull.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Examina-
tion.

continued.

Q. You have looked at these specimens and you have looked at this larger specimen, the big broken one, Exhibit 42. You have examined the depth of penetration and you have learned of the strength of the weld on a pull? A. Yes.

Q. And I want you to give me your opinion of that weld in 1923. A. The weld used here is what is known as a collar weld. It is the type that was used extensively in the pipe welding activity. The reason for using a weld of this kind was that to obtain fusion throughout the full thickness of the material to be joined requires a high degree of skill. It is very difficult to melt down the last thin layer of metal on the inside without having the torch burn a hole through. When holes were burned through as frequently happened, the repairing is extremely difficult or tedious. But what is more serious is that when they burned through, molten metal was allowed to come within the pipe and hang as what has been called icicles—hardly icicles, but of that form—on the inside of the pipe. And in the oil industry the obstructions of such kind are very serious, because in their line of activity they have what they call a go-devil—a tool that they push through the pipe under pressure and any obstructions would interfere with it. 10

Q. I am showing you a slug. Is that what you mean? Does that illustrate it? A. Yes. 20

Example of "icicle" marked Exhibit 83.

(Answer continued): On account of that defect and realizing that skilled mechanics are scarce, and not wishing to take any chances of icicles on the inside or similar unfortunate experience, complete penetration was not asked of the welder. But in turn he was asked to reinforce the weld on the outside with more metal so as to build up the strength required in a joint even without full penetration.

Q. And the building up. Is that illustrated by the bead on Exhibit 43? A. Yes, sir. 30

Q. This ridge you call a bead? A. Yes.

Q. And that is built up from weld metal? A. Yes, sir, that is all weld metal. In the form of a welded joint such as this is perfectly safe on pipe of relatively small diameter, possibly twenty-four inches or less. But it is of no particular value on a plate or tank where the surfaces are flat and where there is no assistance given the weld from the form of the container that the weld is used on. From that design of joint, largely based on making the welding easier for the mechanic, we have developed a code which permits now the use of this weld for pipes twelve inches in diameter or less for pressures of steam pipe to one hundred and fifty pounds. The joint is being used extensively in the United States in pipe work. 40

Q. Today? A. Today. We have thousands of miles of piping laid with this kind of joint where we are operating under relatively high

pressure, and the results have evidently been entirely satisfactory because only last year a mile length of eight inch pipe was laid with instructions from the owner to use this type of joint.

Q. Now I want you to give me your opinion as to whether or not in 1923 the actual weld that you see there broken and having regard to the test which was made, was a reasonably good weld as of that year?

A. Well of course, after we have had it said in Court by two gentlemen that it was a bad weld, it is rather assuming for anyone to say it was not. But I say it was a good weld. It was a good weld of the kind that was
 10 used. It gave all the service that a weld of that kind could be asked to give. The mechanic that made that weld displayed his desire to do good work, very cleverly on the bead. You will find that the ripple is very even, showing that the man took care to make a real good job out of it.

Q. You might show his Lordship what you mean by the ripple. It is quite apparent.

THE COURT: Oh yes. A. In common to that he did one thing you rarely find that welders will be careful enough to do—where a welder starts his weld he invariably leaves a place that is very easily recognized as the starting point, but in this case when the man reached that point
 20 he went over that point and completely destroyed the appearance of his starting point and made the weld look the same all the way around. And from my experience in dealing with welders, I can assure you that that is a rare trait for an inspector to find in work of that kind.

Q. Now in recent years have devices been adopted in order to get welders to penetrate deeper into the metals? A. Yes. In order to make the least expensive weld from the standpoint of using a weld metal and the time to make it, you used what is called a "V" weld or the edges are bevelled to an angle of thirty degrees and when the two pieces are put together within one-sixteenth of an inch and with the re-stopping of one-
 30 sixteenth of an inch from the inside of the pipe, that presents a form of weld which is the most economical to make from all standpoints and makes, or gives when properly made, good results. The making of such a weld in a relatively proper time requires an excellent welder or else the engineer may, in order to establish confidence in the mind of the welder, put a narrow strip of metal, it may be three-quarters of an inch wide or one-sixteenth of an inch thick in the form of a band on the inside of the pipe at the joint. And the welder, having that small backing strip, seems to have the confidence that he can make the weld all the way through without producing any bad effect on the inside of the pipe. However,
 40 the larger number of pipe welds made today where oxy-acetylene torch is used, the joint is bevelled to half the depth of the thickness of the wall of the pipe and the other half is left straight and the welder, knowing that he has anything from one-eighth to three-sixteenths more material to go through, allows himself to go very close to the inner surface of the plate and makes up his joint in that way.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Examina-
tion.
continued.

Q. Now have you considered the question of the break in this weld from the point of view of being broken by bending? A. Yes.

Q. You might tell me what your idea is on that. A. When we had established the strength per square inch of weld metal at thirty-nine thousand odd pounds and had established what the maximum stresses may be of a pipe in the ground on the often abnormal temperature changes, it was obvious that we had to find some other way to break the pipe than by merely laying in the ground. If the pipe was installed with a sag in it, a pipe of this kind with welded joints could sag from its own weight about six or six and one-half inches or more than six and a half inches and under those conditions the stress in the joint in the metal would be about eleven thousand pounds, which again was a very small figure as compared to the ultimate strength of the weld metal. Therefore, we tried to find out what could break the weld, in a logical manner. From our reports I learned from the Dresser coupling found at each end of this eighty foot length of welded pipe—these couplings were in proper condition when the pipe was taken out, I think it was in June. And that indicated to me at least that the bending of the pipe did not go back as far as to the Dresser couplings. So I arbitrarily established a distance between supports for a twelve inch pipe of fifty feet which would leave somewhere around fifteen feet between the fixed support and the Dresser coupling. Then we established the diameter of the weld inside and outside and in order to be conservative—if I can be considered as being conservative—we used the thickness of the metal at the thinnest part of the weld which was .28 and was found at the bottom part. And we used the offset or eccentricity relative to the pipe metal as given in the report that was sent in—Professor Cameron's report. If I remember right, that offset or eccentricity was .143 or .148. 10 20

Q. You might show his Lordship what you mean by "eccentricity". A. The distance from the centre of the metal to the centre of the weld metal is the eccentricity. The distance from the line running through the centre to the centre of the weld is the eccentricity. The outside diameter is very much larger than the other diameter. After we had established the diameters, it was then only a matter of using the standard formula for a beam with fixed ends with a load over its full length. From these figures we learned that the pipe for its settle had sagged five inches from this normal line and at that point the fibre stress would be that of the ultimate strength of the weld metal. Therefore, any additional bending, either due to increased load or decreasing the support would break the weld. And after it once started to break, it requires little or no activity beyond vibration to keep it breaking until it finds a support. 30 40

Q. What have you to say with respect to a collar weld in beam action, I mean the pressure on a distance such as you spoke of? A. Well, a collar weld just helps or is a better joint from a beam action than a proper "V" weld would be, due to the fact that you are bringing the metal surface away from the centre than would be true in a "V" weld.

THE COURT: I do not quite understand what is meant by what the witness says with regard to bending or sagging to the extent of five inches. I understand this particular piece of pipe might have sagged five inches without breaking? A. Yes, when it reached the five inches of sag it would be just at the breaking point.

*In the
Supreme
Court of
Alberta*
—
Defendant's
Evidence

CROSS-EXAMINATION BY MR. WOODS.

No. 55
Eric Harold
Ewertz
Cross-Ex-
amination

Q. That statement depending on the validity of the computations as sixty-eight and one-half strength given by you— A. Naturally depends on the strength which was thirty-eight and one-half per cent. It has nothing to do with the strength of the joint.

Q. I have here a report of the American Bureau of Welding, published in September 1931, and I find there among the personnel of the committee quite a large committee and E. H. Ewertz on it as consulting engineer? A. Yes.

Q. And that is the gentleman we have before us? A. Yes.

Q. And with as much assistance as I could get from Professor Morrison, I tried to understand something of this report to which you were a party? A. Yes.

Q. And the first thing I noticed was that in the specifications for single joint of weld welded on one side only, the specification requirement your committee called for is one hundred per cent. penetration. Is that right? A. Yes.

Q. And also I observed in this same publication you had requirements laid out to qualify welders. That is to say, the requirements that you called for from a good welder? A. Yes, sir.

Q. And in the gas—in connection with gas—welding for the purposes of gas—I find that you require an average of fifty-two kips, that is fifty-two thousand pounds? A. Yes.

Q. Per square inch? A. Yes.

Q. With a minimum for any individual coupon of fifty thousand pounds? A. Yes.

Q. And any weld below that requirement you would not say was made by a good welder? A. Not today.

Q. But do I understand in September 1931—do I understand you to say in September 1931 that you would have required a good welder to produce an adhesion equal to at least fifty thousand pounds to the square inch in his weld before you would regard him as a good welder, whereas today he could produce a weld of thirty-nine thousand pounds to the square inch only, and be regarded a good welder? A. Thirty-nine thousand pounds per square inch was a good strength at the time that the weld in question was made, because the welding rod then used was a soft iron and did not allow conditions to be such as to produce much over forty thousand to forty-five thousand. In 1931 they went to a vast change

in material, both as to material and welding rod and today the requirements in the code you have before you are far below the requirements of some other codes, but the code that you have before you is for structural welding and not pipe welding.

Q. Is there anything said in that report to which you were a party that indicates one suggestion that the statements made in there do not apply to pipe welding? Show it to me. A. I could not show it to you.

Q. Well, there is the book. Take all the time you like. A. I do not need any time because I know the book. I have been through it ever so many times. When we talk about structural welding as a profession, we are not talking about pipe welding. We are talking about welding for structures as are produced by bars and plates. 10

THE COURT: What is the name of the report?

MR. WOODS: "Report of Structural Steel Welding Committee of the American Bureau of Welding."

Q. I understand you to tell me now that when you used the words "structural steel" you did not refer to structures such as pipelines? A. Certainly not.

THE COURT: As far as that is concerned, I do not mind saying that with my very limited knowledge I would have thought the same thing. It strikes me that the reading of the outside would have indicated it. 20

MR. WOODS: What is the gas ordinarily held in—pipes?

THE COURT: I was just telling you—

MR. WOODS: I notice your Lordship has told me things from time to time in this case, but it occurred to me that a pipe was a structure.

THE COURT: All I was telling you was this—however I won't make the remark. Just go on.

Q. MR. WOODS: What, ordinarily, is gas carried in—pipes or what? A. Gas is carried in all kinds of containers from balloons and up, and that book that you have before you there does not refer to gas on the standard of containers, but gas used for making the welds. 30

Q. You know a great deal more about this subject than I do that it is foolish for my suggesting anything to you by way of criticism, but I am showing you at page 27 of your report—let us see what the requirements are. That is the requirement for a welder? A. Yes.

Q. The kind of a person that is required to be tested. And in order to qualify that individual the pulling strength per square inch of weld "throat" we require an arc—an average of forty-five thousand pounds per square inch and in any individual coupon of forty kips causing an average of fifty-two kips with a minimum for any individual coupon of fifty kips. Now I take that to be that in order to qualify a welder in re- 40

spect of a weld he made for carrying gas, that you would have to have an average of fifty-two thousand pounds per square inch with a minimum for any individual coupon, out of the container carrying the gas of fifty thousand per square inch. Was I all wrong? A. Absolutely.

Q. I see. Well, what does gas mean there? A. Welding by the use of gas or by the aid of an electric arc.

Q. And in no part of this report—this report has not any bearing at all on pipeline construction? A. No, sir.

THE COURT: What is the answer? A. No, sir.

10 MR. WOODS: So I gather from what you have told us then that in your view, pipe welding can be and should be inferior to structural welding. Am I right? A. Not right.

Q. Well, put it another way, that pipe welding does not require welding to have the requirement of being able to make a weld as strong as structural welding? A. It depends upon the service on which the pipe has to be used and the pressure it is operating under.

Q. And I gather from what you say then that in pipe welding that you do not require a penetration of one hundred per cent. Is that right? A. That again depends upon the service. If you carry a steam pressure
20 of seven hundred and fifty pounds you need the best possible joint that can be made which will be rightly one hundred per cent. of the pipe. On the other hand, in water piping or low pressure piping such as found in buildings with services from fifteen pounds up to one hundred pounds there is no benefit from a weld being stronger than the service required.

Q. And for a pipe carrying gas at forty-five pounds pressure to the square inch—a highly dangerous gas if it escapes—such pipe resting on backfill, in frost, in this country, would require one hundred per cent. penetration if you were making a test of a welder. A. If the thickness
30 of the pipe in question was based on service rather than on pressure, I might require a weld equal to the pressure the pipe was to render, but may not require it to be equal to the service that pipe required.

Q. I do not think you have answered my question. I asked you to take the instance of a pipe carrying Viking natural gas at a pressure of thirty-five pounds to the square inch, and take that pipe laid on six or seven inches of backfill, and if you were responsible for it would you instruct your welder to penetrate that pipe with the welding material or would you not? A. Only when the thickness of the pipe was equal to the pressure required and not to the service required.

Q. The thickness is one-quarter inch pipe? A. But it is not required.
40 Q. And the only other element is the thickness of this pipe. It is one-quarter inch pipe. Would you have required if you were welding a joint in that place—would you have given the specifications to your welder to make one hundred per cent. penetration? A. No, sir, neither today nor in 1923.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Cross-Ex-
amination
continued.

Q. And what percentage of the penetration would you give? A. Only sufficient to equal the stress the pipe was exposed to for the pressure it had to carry.

Q. Could you tell what pressure the pipe was going to be exposed to? A. Absolutely.

Q. Could you tell how far it was going to sag? A. If it was going to sag and you had pre-determined it was going to sag you would have to take that sagging into calculation and base your claims on it.

Q. And suppose it was going to sag six and one-half inches would you say you were safe in telling your welder not to make one hundred per cent. penetration? A. I would, because the weld we have before was equal to that condition. 10

Q. The weld before you did not make the one hundred per cent. penetration? A. No.

Q. And you would, knowing the pipe was going to sag six and one-half inches in the backfill? A. Yes.

Q. You would have let your welder go on and make a joint with less than one hundred per cent. penetration? A. Yes because I would have told him how to lay it in that sag.

Q. And if you had taken into account the possibility that in making a weld of less than one hundred per cent. penetration there might be a fissure left which would propagate a break, would you have told him to make a penetration of less than one hundred per cent.? A. There was nothing in this pipe that would make me change my mind as to the point requiring a better weld than that found. 20

Q. And assuming for the purpose of my question that the weld that was found is a weld that had a fissure in it and a sharp crack in it, would you say that that is a proper weld? A. I would agree with what you call a fissure. I do not just know what that is but there is a space between the two pipes on the centre of the surface. That is a testing place. The weld supports from half the thickness of the pipe and goes outward. The imperfections of the weld as seen from this specimen is not so bad as to condemn it in any code that we have written up to the present time. 30

Q. Assume for the purposes of your answer to my question that there was in fact at the time this weld was made what I have called a fissure—I don't know what you call it—the thing that appears in the photographs, between that place and the welded material—there was the beginning of a sharp crack. Would you call it a good weld? A. That is the form of a standard collar weld such as allowed in the codes today.

Q. So that you would have no objection to a crack and fissure of that kind? A. It is not a crack or a fissure. It is a space between two surfaces that has never been joined and is not being joined in the weld made. 40

Q. You understand my question? I am assuming that at the end of that space that there had been a crack immediately, almost immediately,

upon the making of the weld. Would you call it a good weld? A. Depending on the size and the form of the crack. An arbitrary statement is impossible to make. You have to know the conditions more definitely than you have presented them.

Q. Take a fine crack? A. If there had been a fine crack and the specimen had been put to a test it would have broken and showed itself as to its strength.

Q. I just want an answer to my question. Would you call that a good weld if there had been a fine crack? A. There could have been a fine crack of a minor nature and be perfectly good.

Q. How minor? A. Well if it was half way through. But if it was one-thirty-second of an inch in length it would be very small.

Q. Would you agree that if it had reached the welded material and thus weakened the structure and gone through unwelded—

MR. SMITH: I do not think you mean through the unwelded material, do you?

MR. WOODS: I do.

MR. SMITH: I do not know how you could have the crack in that unless through the pipe.

MR. WOODS: Would you regard any weld with a fine crack in it as being a good weld whether welded or unwelded? You said if it was one-thirty-second of an inch long you would not think it was a bad weld but if it was half way through the material it would be. Now do you agree that however small that fine crack is; if it is a sharp crack, a sharp pointed crack, that it is going to propagate itself through the material? A. Yes it is apt to.

Q. Are you a member of the American Society of Mechanical Engineers? A. No I am not.

THE COURT: I understood, I do not know whether I am right or not, that there is evidence that what has been called the fissure or crack which you call a space has the tendency to propagate cracks. I understood Professor Morrison to say it had the potentiality to bring about cracks. Now the present question, as I understand it, the witness says that what has been called a fissure or crack is not what he would call such. Now you asked him whether or not assuming a crack which would propagate this, and he agrees with that? A. Yes.

Q. Am I right that this witness whether rightly or wrongly differentiates between those two things—between what you are asking him now as to a crack and what Professor Morrison called fissure or crack?

MR. WOODS: Well let us get it right. I have called the thing a fissure which you refer to as a space between the two metals such as is shown on Exhibit 45, this "V" shaped place? A. Yes.

*In the
Supreme
Court of
Alberta*
—
Defendant's
Evidence
—
No. 55
Eric Harold
Ewertz
Cross-Ex-
amination
continued.

Q. I have called that a fissure and you have called it a space. Now I am referring to something that starts from the end of that in the shape of a sharp crack such as you can see on that photograph (Exhibit 45) and that is the thing that propagates itself and which you agree with me that it well might? A. A crack is a broken part of a piece of metal or wood. If you want to produce a crack it must be in one piece of metal, not in two pieces of metal. A space between two pieces of metal can never be a crack. It is a space.

Q. Was the space at the end of this thing that I have called a fissure in both Exhibits 45 and 46? A. Yes. 10

Q. You will observe in Exhibit 46 it is better shown, a dark part going up into the metal? A. Yes, that is the space.

Q. Now does that, suppose that it is sharp ended, propagate itself? A. Whether sharp end or blunt end it will propagate itself.

Q. THE COURT: What I really wanted to know is this, and I suppose this witness knows what has already been stated as to what in the opinion of those who gave evidence, would propagate itself. I would like to understand whether or not this witness agrees, for instance, with Professor Morrison as to the thing which will propagate itself. Do you understand me? A. Yes, sir, your Lordship, you are correct in that. 20 That is the reason I show you that sketch and that model, to show you how that "V" on the inside between the two ends of the pipe pointed up under certain conditions as a "V" and under other conditions, parallel. When it opens as a "V" it is very much detrimental to the strength of the weld, and the cracking on all those specimens started from the inside.

Q. How do you differ from the view that has been expressed by the experts for the plaintiffs? A. I do not differ from Professor Morrison in any way except from the standpoint of how to properly pull a specimen in order to give it its true value when it is taken from the pipe. Otherwise we agree. 30

Q. MR. WOODS: You are acquainted with the publications of the American Society of Mechanical Engineers? A. Yes.

Q. And they would be regarded as authoritative on the subject we are into here of oxy-acetylene welding? A. They are insofar as certain members of the Society is concerned particularly in connection with the Boiler Code Committee.

Q. Well take Mr. S. W. Miller. He seems to be quite an eminent member? A. Yes. He is now dead. He was a good authority on oxy-acetylene welding.

Q. I will give you something he said: "It is possible of course by reinforcing a double 'V' weld sufficiently to make it stronger than the plate but this is not possible in a single 'V' weld." Do you agree with that? A. Yes. 40

Q. "In the latter case the heavy reinforcement made by adding

metal on the top of the weld tends to weaken it rather than strengthen it, due to the fact that the load is eccentric?" Is that right? A. It is right under certain conditions.

Q. "There is still further a practical condition which affects the result even when the weld is apparently sound as in many cases there are defects at time of microscopic size at the bottom of the 'V'. These defects are in the form of cracks which tend to propagate under stress and cause rupture at a lower load than if they were absent." Now is he right?

A. Well when he used the word "crack" it could not be the space between two metals. It must be some crack he has reference to in the weld metal as made or between the weld metal and pipe metal as made.

Q. I have read you the whole paragraph. He is referring to a case of in the first place of a single "V" weld. That means welding two pieces of metal? A. Yes.

Q. And Mr. Miller is not referring to a crack. He is speaking of the crack at the bottom of the "V" and the bottom of the "V" is the place where the two pieces of metal come together. I do not want to get into a quarrel with you and Mr. Miller over the use of or the meaning of the word "crack." A. When he welds through the bottom of the "V" there is no separation of the two metals any more and the crack he refers to is a cooling crack—when the metal cools and contracts.

Q. I am pointing out here what he says that in the case of a single "V" jointed weld that in many cases there are defects, at times microscopic in size, at the bottom of the "V." "These defects are in the form of cracks which tend to propagate under stress and cause rupture at a lower load than if they were absent." Now do you agree with that?

A. No I do not. As long as you insist upon the word "crack" it means the separation between the two metals.

Q. Well I am using just the word Mr. Miller gives. A. Well I knew Mr. Sam Miller very well. In fact I hold the medal that he presented to the Society and he was one of my very dear personal friends and I would hate to disagree with him now that he is dead and gone, nevertheless I have to do so because a crack cannot be a space between two metals.

Q. "In the case of a double 'V' weld these defects if they exist are in the internal axis and therefore have less effect than a single 'V' weld. There is one more thing which has a greater bearing than any of those bearing on the strength of the weld and that is whether the weld is sound or not. Evidently if thorough fusion has not been obtained along the sides of the 'V' no conclusions can be drawn as to the tensile strength or other physical properties and the writer believes that in every test the condition of the weld with regard to this point should be recorded. It is evident that in the case of a single 'V' weld if the bottom of the 'V' is not thoroughly fused the condition of eccentric loading is curvetted." Now do you agree with him? A. What particular portion of that?

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Cross-Ex-
amination
continued.

Q. The last sentence I have read having regard to what he said before "it is evident that in the case of a single 'V' weld if the bottom of the 'V' is not thoroughly fused the condition of eccentric load is curved?" A. That is true for anything but piping.

Q. That is not true for piping? A. No.

Q. When did all this wisdom on the subject of pipe welds come to the surface? A. Gradually since 1915 and we have gathered it from year to year.

Q. But this differentiation between the strength of pipe welds and other welds and this whole matter of oxy-acetylene welding as in for instance, this discussion? A. Mr. Miller has been dead five or six years and it was written before that time. 10

Q. Has it been quite recently? A. What you have there is not recent.

Q. But it is quite recent that this differentiation between the strength required in pipe welding and the strength required in the welding of flat pieces has come to the knowledge of welders? A. I don't think so.

Q. Well when did it come to your knowledge? A. I have known it for a long time. We have done pipe welding of this kind for a great many years and we have hundreds and thousands of piping with that kind of joint in service and is being used today. It is nothing new about a collar weld. That is the oldest pipe line weld. The value of it has not been questioned due to the fact of the service it has rendered. 20

THE COURT: What is the name of Mr. Miller's book?

MR. WOODS: In 1931: "Transactions of the American Society of Mechanical Engineers." I was quoting from the discussion of oxy-acetylene welding and cutting blow pipes, at pages 201 and 202, and the discussion of the whole subject of oxy-acetylene welding.

Q. Now before I am finished with this little book I notice that in your recommendations which apply to open hearth base metal forming, two specifications of the A.S.T.M.—you have certain recommendations with regard to a butt weld test. Now that is the kind of weld we have in this case. It is a weld where the two butts are together? A. Yes. 30

Q. And the butt weld test there is this: "A tension test as described in section 242, two specimens were considered sufficient, one to be welded in the flat position and the other in a vertical position. The four coupons when cut from each specimen appear in accordance and show a minimum strength of square inch per 'throat' of forty-five kips with an average for eight coupons of fifty-two thousand pounds." Do I understand you to say that entirely has to do with structural steel? A. Yes, sir. 40

Q. And has no bearing on pipe construction? A. Yes, sir. I can show you another code that has nothing to do with only pressure vessels.

Q. Can you show me any code that has to do with pipe welds?
A. No, I do not think it is printed yet. I think it is being printed now. It has been passed.

Q. You of course are acquainted with the publications of the Dominion Oxygen Company in respect to engineering and management, the phases of the Ox-Welding construction? A. I am afraid not.

Q. But at all events you are acquainted with the American Bureau of Standards? A. Yes, sir.

10 Q. And I am reading from the report of the investigation of strength of welded pressure vessels? A. Yes, sir.

Q. From the United States Bureau of Standards? A. Yes, sir.

Q. And that is an authoritative authority? A. Yes, sir — very reliable.

Q. Now the pressure vessels there referred to—welded oxy-acetylene vessel would be a vessel such as a gas pipe as well as any other vessel? A. No, it does not deal with piping — storage vessels or tanks of various sizes.

Q. And this is not a tank? A. Yes.

20 Q. Well is not this a tank? A. Well a tank as small as twelve inches in diameter would not be in the code you have before you. At least I would not think so.

Q. But this investigation was made by the Pressure Vessel Committee to determine the strength of welded tanks? A. Yes.

Q. As I gather a welded tank may be larger in circumference but it is in the same form as a welded pipe? A. Yes, right.

Q. And I would think—correct me if I am wrong—that the remarks made in respect of welds for welded tanks would certainly throw some light upon the subject we are dealing with, would they not? A. Yes, they might.

30 Q. And the remarks made in this report that it refers to welded tanks, would be appropriate when applied to the welding of pipes. Am I right? A. Yes.

Q. Now let us get at what some of the statements are. The report of your investigation proceeded first of all with the description of the authorities and the test methods and then a description of the tanks. regular tanks made from three-inch mild steel and special tanks were made and so on and then the test results were given as in the tables annexed to the report. Now the discussion of the results the first statement made is and I want to see whether you agree with me—

40 MR. SMITH: You are still quoting?

MR. WOODS: Yes, from the United States Standard Bureau Report: "The tests show clearly that the double 'V' weld is superior to the "single 'V' weld in the longitudinal seam." That is correct. You will agree with it? A. Yes, sir.

Q. "And for different regular type tanks the results are single 'V'

“weld seventy-six and three-tenths per cent and double ‘V’ one hundred and one per cent.” Now I take that to mean that in connection with a single “V” weld the tests to which they were subjected showed that at the welded place the tank was seventy-six and three-tenths per cent of the strength of the tank material and that in the case of a double “V” weld where the metal is fused in from both sides in the “V” shaped cavity that the strength of the welded material was one hundred and one per cent of the tank material? A. For a longitudinal weld?

Q. Yes. That is right? A. Yes.

Q. Now for special tanks the following are recorded conclusions of the committee or of the investigators. A good tank is one hundred and two and seven-tenths; a fair tank is eighty-five and four-tenths; a poor tank fifty-one and two-tenths, and a bad tank forty-three and one-tenth. Now would you agree with that method of classifying welds of pipe material when you see that Bureau of Standards Report? A. I should accept it or primarily so because in this case the welded joint as a joint was eighty-two per cent of the strength of the pipe and eighty-five per cent is considered fair. Therefore I shall not quarrel about that. 10

Q. I am referring to this statement as being a fair statement to make with regard to the welding of pipe material? A. What statement is made in there refers to longitudinal welds, not circumferential welds? There would not be much difference except that the circumferential weld is not of great importance. 20

Q. But the report may be taken to refer to the kind of weld we have here and are investigating. A. Eighty-five per cent would be a good weld.

Q. And if it went down to—let us get it into Table 2—“Summary of Tests of Oxy-acetylene Welded Vessels.” First of all the pressures at boiler pressure tests, it showed the ultimate strength of plate and manufactures classification of workmanship and the efficiency of the weld. And we are interested in the classification of the workmanship in relation to the efficiency of the weld? A. Yes. 30

Q. And I notice that when they come down here to forty-five and six-tenths per cent of efficiency it classed that workmanship as poor, you will observe? A. Yes.

Q. And when they come to sixty-five and two-tenths they class the workmanship as poor? A. Pressure vessels—yes.

Q. And when they come to fifty-four and five-tenths they class the workmanship as poor? A. Yes.

Q. And of course when you have got them down here thirty-two and three-tenths and forty-four and four-tenths of course they are poor? A. Yes. 40

Q. But I point out to you that where you get down to No. 22 you have an efficiency of sixty-five per cent and it is classed poor? A. Yes, if that is in the last few years that would be absolutely sound engineering practice.

Q. And it is also sound engineering practice to regard the double "V" weld as much superior to the single "V" weld? A. Yes, there is no question about that. You cannot put a double "V" weld on a joint unless you have a man working from both sides.

Q. I thought one of the witnesses spoke of there being a bevel? A. He is correct. The bevel on the ends of the pipe as it came from the manufacturer was a slight bevel to take the raw edge away from the end so as to make the coupling or the Dresser coupling easier to apply but it had nothing whatsoever to do with welding.

10 Q. It had nothing whatever to do with the "V?" A. Absolutely not.

Q. At all events there is nothing to prevent the welding material being put in a single "V" weld? A. Oh no.

Q. And I would take it, and correct me if I am wrong, that these two welded pipes were put right together. There was no space left between them by the welder so as to work his welding material through but they were put quite close together when he did his welding? A. There is no indication to prove that they were put together. Rather the indications are they were from a one-sixteenth to one-thirty-second of an inch apart
20 when they were tight welded.

Q. If they were one-sixteenth of an inch apart why should he not have put his welding down? A. Because he was afraid of going through.

Q. Well suppose he did make a bulb in the inside what harm would it do? A. No harm except that he would be criticized for that class of work, and if you know you are going to get fired because you are doing something you are going to try not to do that to save yourself.

Q. Can you explain to me if there were a little protuberance on the inside of that pipe that that would hurt the transmission of gas? A. No, it would not hurt the transmission of gas. It would not help it at all.

30 Q. I am speaking of what in ninety-nine cases out of a hundred would happen if the welded metal went through. It would be merely a small bulb? A. I am afraid it would be very hard to explain to you just what it would look like or explain to anybody that is not familiar with welding because it is quite a complex matter. The best I can tell you about it is if you went through to the bottom it would have little lumps right along on the inside protruding more or less, if it was a real good job. If it did not it would burn holes and fill them up again and you would have deposits of metal and all kinds of lumps.

40 Q. But a real good skilful man would weld that from the bottom upward and with one hundred per cent penetration without leaving anything, wouldn't he? A. Well there may be such animals around. I have never had the pleasure of meeting a welder who would undertake to weld through a pipe like this. As a matter of fact the samples we made with the skilled welder proved that even a skilled welder could not do it and

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Cross-Ex-
amination
continued.

do it right and we had to cut the "V" in the bottom with a hacksaw in order to produce a true form.

At 4:20 Court adjourns till 10:00 a.m. Tuesday, January 30th, 1934.

Tuesday, January 30th, 1934, Court resumes at 10:00 a.m.

MR. SMITH: If Your Lordship pleases, my learned friend asked me to have a photograph of the portion which was taken out of Exhibit 43 and filed as Exhibit 68. This is the photograph and it will be Exhibit 84.

Photograph of Exhibit 68, marked Exhibit 84.

(Cross-examination continued):

Q. MR. WOODS: I am necessarily under the handicap of not being 10
a welder and you will have to be very definite with me until I understand
what this matter is that is explained in Exhibit 81 and this little model.
And having regard to a piece of the welded pipe that has been handed to
me this morning by Professor Morrison in order to get the matter clear
as I see it. This is Exhibit 81 you put in and this model was intended to
illustrate this theory of yours or statement of yours that in a piece of
metal such as we have with a bulge on that side, that the stress line goes
through the bulge that way as shown? A. Yes, sir.

Q. And as illustrated on the model when you pull this cord—(this 20
stress line)—this notch opens out? A. Or opens in.

Q. And you said in order to get the true stress what you did was to
support that by a piece of wood on that side and then pull from this cord
and the notch does not open as much? A. Well that depends of course
on how hard you pull. The form of the opening is slightly different.

Q. But it is based upon the theory, the fact that this thing holds that
notch in place so that it does not open as much as it does the other way?
A. It does not allow the test piece to bend.

Q. Because without it the test piece, as it were, opens that way?
A. Bends inwards.

Q. When you took your test on that, I gather you had it in a testing 30
machine? A. Yes.

Q. I am illustrating by reference to this piece of metal which I put
in. But just show me where you had your clamping machine on the piece
of metal that you tested in relation to that machine? A. The clamps
were placed approximately out four or five inches away from the centre
of the weld.

Q. That is my understanding. And those are heavy clamps to hold
the thing in place and then there is a draw on it? A. Yes.

Q. And that is the way you test this stress? A. Yes, sir.

Q. Now I am suggesting that if you have your clamps as close as you 40

have, four or five inches away, from the piece, that the stress line will go right direct through the middle of the thing? A. It will go right through the middle of the thing but the middle of the thing is the middle of the weld.

Q. Well will the stress line in that piece go in a horizontal line where you get your clamps—the piece I have in my hand or a similar piece?

MR. SMITH: It was a different weld, of course.

MR. WOODS: Certainly. But I am illustrating it by this. A. In the piece that you have here prior to it breaking the stress would go
10 through the middle of the metal from the inside surface to the outside surface and the way of the weld and in the middle on the outside the way of the pipe.

Q. I am told by Professor Morrison that he understands what you mean if you have put your pulling as you did on this little cord? A. Yes.

Q. But where you put the clamping machine or the thing that pulls close to the weld as you did in this case that that result will not happen? A. Yes, sir. It will be curvetted. The closer the clamps are to the weld the more curvetted will be the action on the welding.

Q. Well we will ask him about that. But take this piece I have, and
20 I am going to ask it to be accepted as being a piece of the weld metal from the pipe—one of the pieces that Professor Morrison had welded, as he told us in his examination to illustrate that this pipe metal would weld? A. Yes, but you stated that is from the weld metal. That is not true. It may be a piece from the pipe but it has been welded since it was cut out and it is not part of the weld as found in the pipe originally.

Q. But it is a piece of metal from the pipe? A. Oh yes, that may be true.

THE COURT: And has it been flattened out? A. Oh no, it is still curved; it is still round.

Q. MR. WOODS: This is a piece of the very pipe? A. Yes, sir.

Q. And Professor Morrison had the pipe cut at that point? A. Yes.

Q. And then he had his welder make that weld that we see there?
A. Yes.

Q. And then he put the piece as welded in a testing machine?
A. Yes.

Q. And it did not break at the weld. It broke here in the material. Now does that suggest anything to you? A. It merely suggests that the weld was made stronger than the material welded. Therefore it had to break in the material itself.

Q. But I am suggesting to you that if your statement is true that
40 under those conditions where you got your clamp as close as your clamp

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Cross-Ex-
amination
continued.

was to the weld and as close as this clamp was that the bending action would break that piece of metal at the weld and would not break it where it was? A. Why should it?

Q. Because of the action you have illustrated with this little diagram, whereby that weld metal opens at that point. A. If Professor Morrison had made that weld like the weld found in the pipe with spacing of pipes on the inside unwelded, it would have broken in the weld.

Q. Yes, but is it consistent with your theory of the force, the way the force goes through the material as illustrated in your diagram 81, that that piece of weld metal should not break at the weld but should break in the pipe metal? A. Yes, absolutely consistent, and further than that it is very interesting to note that while it broke in the pipe metal the stress at the weld was sufficient to create a crack at the point where the stresses were concentrated. 10

Q. That is that little crack you see there? A. Yes, sir.

Q. And it is also interesting to note, isn't it, that there are no protuberances or icicles or anything underneath that piece of weld metal? A. No, that is not remarkable at all.

Q. That weld metal, as you see it, has one hundred per cent. penetration, hasn't it? A. From the appearance to the eye I should say that what now appears as a crack is probably a crack and not a lack of penetration. 20

Q. That the weld metal did penetrate one hundred per cent. in that piece? A. Yes.

Q. And left no protuberances at all? A. Well that is nothing strange about that.

Q. I think you regarded a welder who could do such a thing as that as a super-man, and here is an ordinary welder in the City of Edmonton and Professor Morrison took it to him and under his supervision he has it cut. And the material goes through the weld one hundred per cent. as indeed he has told us in his examination-in-chief and there are no protuberances left on the inside? A. Right. And I explained yesterday that that was perfectly possible under certain conditions. It would have been very much more interesting if this specimen had been a bad welded pipe by your expert welder. Then you may have had both holes and slugs inside the pipe. 30

Q. You, I understood, have never found a welder like that? A. Oh yes, I have found them and they are to be found.

Q. Just tell me another thing about this and then I will be through. Perhaps I have not explained as well as an expert could, but we will try and explain what we mean. What is your reason for putting in this model and supporting that pipe on the inside so as to show that then it does not open as much? What was there on the inside of this pipe that connected in the same way against these welds, this "V" notch or space or fissure or crack or whatever you want to call it in the same way as that 40

piece of wood does in your model? What force was there pressing against it in the actual weld? A. In the actual weld you had the formation of a pipe and if you had pulled the pipe as a whole you would have got the same result as that, you would get by pulling the piece with a backing up strip; whereas if you had pulled a piece without the backing up strip you would have lost the support that that strip normally had in the pipe from the adjacent material in its form and you would have got a lower result.

10 Q. You do not mean to indicate that there is anything right up against this weld that acts in the same way as your wood on this piece of rubber? A. That is the nearest way we can demonstrate the principle of it.

Q. And your theory is that there is a force which you visualized in this model as this piece of wood that in the case of the pulling of a hollow circular piece of steel for the purpose of testing acts in the same way as this force pressed against this rubber. Am I right? A. Yes.

Q. And that would be caused by reason of the fact of it being round instead of being flat? A. Quite.

20 Q. I am accepting your explanations generally because you know a great deal more about it than I do. This is the theory you have developed? A. No, sir.

Q. Well it is a theory at all events, that has come into welding—in practice even—but into the consideration of welders, since that report was made that I showed you of the American Welding Association? A. It is the now accepted method of testing pipe specimens.

Q. And there has not been any code made of it yet. A. No, it probably will come out in the pipe code.

Q. Because it occurred to me—there are of course such things as hollow round pieces of structural steel? A. There may be.

30 Q. Well I mean take the masts on these American battleships or the supports underneath some of these bridges like the Forth Bridge in Scotland where you get under it you see the girders are round big pieces of steel. Or take the mast on an American battleship. That is a round piece of steel. A. Yes, that is not a structure.

Q. Do I understand you to say that that kind of steel in the Forth Bridge or the American battleship is not a structure? A. I cannot say what it is in the bridge because while I saw the bridge some eight or ten years ago I cannot tell what the details were.

40 Q. Were you under it? A. No, I was on the bridge. I could not talk about that. But as far as the mast is concerned the Structural Welding Committee was not concerned about structures of that kind, and had no reference to it.

Q. The Structural Welding Committee was certainly concerned with structural steel? A. Yes, sir.

Q. And I am right, am I not, in saying to you that there are such

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Cross-Ex-
amination
continued.

things as hollow round pieces of structural steel? A. As I said there may be but we did not consider it in our report.

Q. I was looking at the introduction to this report and it gives the genesis of the matter and the first paragraph, says: "The world war provided a stimulus for remarkable developments in methods of uniting metals by means of welding. The first important application of these new methods was in ship building followed by major applications in such fields as pipe work, pressure vessels and machinery." Now what I am quite frankly asking you—I am accepting your statement—is this, up to the time, at all events, that these newer codes either appeared or have been considered, as you have told us, am I right in saying that this report of the American Bureau of Welders was the only authoritative code in connection with welding, that is for America, welding of steel structures? A. Yes, sir. 10

Q. And there was no special code or specifications or tests for such steel structures, whatever they might be, as were hollow and round?

A. No, they were not considered in that report.

Q. Well they speak in the introduction to the report of pipe work—
A. Of advanced welding done in various fields foreign to structural work. 20

Q. And what you have developed here, as I gather, is a theory based upon certain other considerations that have appeared since that report was made that modify what it says when the application of the principles it sets out in its code are made to round hollow steel vessels. Am I right? A. No, you are not right. That code has no reference whatsoever to any structure except that it is known as structural steel work and the tests that is covered in that report clearly show you that there is no test of pipes. The question of pipes is another subject entirely.

Q. Take a steam boiler? A. Yes, sir.

Q. Steel structures such as we often have in our basements to hold hot water—a hot water tank? A. Yes, sir. 30

Q. Is that made out of structural steel? A. It is made out of steel.

Q. Is the material in it what you would describe as structural steel? A. No.

Q. It is not? A. It is either tank steel or flange steel or other kinds of steel of higher quality than that used for structural steel.

Q. So none of these conclusions in the report applied to the welding of steam boilers? A. No. There is a boiler code for it.

Q. But is there anything? I have looked through the report somewhat carefully. Is there anything in that report to indicate to the ordinary reader such as myself that the report does not cover every variety of what is known as structural steel? A. There is. First of all the title to the booklet definitely refers to structural steel as known in the engineering trade. And second, all test specimens given in there are conformed to pipe welding. 40

Q. There is nothing in the book itself that puts the unwary and ignorant reader alive to the fact that these conclusions do not apply?

A. No ignorant reader would ever use that book or know how to use it.

Q. Well Professor Morrison spent years of his life in connection with the matter and I suppose you would not suggest he does not know how to use the book? A. I could not suggest anything in that direction. I don't know Professor Morrison or his experience except in the few days I have been up here.

10 Q. Now I am referring to a publication I believe you are familiar with of the British Engine Boiler and Electrical Insurance Company, the technical reports. You are familiar with them? A. In a general way.

Q. And that company is a British organization that insures these various kinds of enterprises, all kinds of boiler and electrical insurance?

A. It seems so.

Q. And they issue a technical report. The technicians employed by them, I suppose you will agree, are men of authority and standing?

A. No question.

Q. And whatever they say certainly refers to boilers, doesn't it? A. I could not answer that.

20 Q. Well they insure boilers? A. That may be one of the things they do insure.

Q. I want to ask you if you will agree with some of the conclusions I find, 1928-29. I have others but I do not want to load up the record with too much technical stuff partly because I think we have probably had enough of it. But I want to see if you agree with this statement. I am reading from page 94 of the report for 1929, the section being "accidents to pressure vessels," and they are speaking here of the welds and one paragraph; he is referring to Figure 81: "Apart from the undesirable thinness of the plate and the ever present element of danger with
30 "a plate heated on one side only the company considers that when plates "have been close butted a weld made from one side is particularly unreliable." Now see if I understand that. He means, does he not, when he speaks of the ends of the welding material being close butted that they are close up against each other? A. Yes.

Q. And he says that a weld made from one side under those conditions is particularly unreliable? Would you agree with that? A. No.

Q. Now this Figure 111. You see this Figure 111, that is Plate 111, and Figure 3 "solid plate contained a nick." A. Yes.

40 Q. Now I do not mean it is the same kind of nick, but it is the same thing we have been referring to as a space or fissure and I think I have called it a crack from time to time, but it is the same thing we have in your little model where you pull the thing apart? A. Yes, I imagine it is.

Q. Exactly. Now let us see what he says about it at page 156 and see whether you agree with it: "Three shows a solid plate containing a nick.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Cross-Ex-
amination
continued.

"It is suggested that the nick is sufficient for a boiler plate to be condemned outright." Would you agree with that? A. It is a solid plate—not a welded plate. With a defect in the plate in the form of a nick certainly ought to be condemned.

Q. Do you distinguish between a solid plate containing a nick and a weld containing a nick? A. Depending on what service the plate or pipe is to be used for.

Q. Quite. Quite. And if you have got a service such as Mr. Hill described here, in his anticipation—a pipe that was not going to be subject to the stress of subsidence practically at all, I don't suppose you and I are going to disagree that such a pipe would not need to be welded particularly carefully at all. That is right, if it is going to remain on the horizontal and not going to be subject to stress the weld need not be any stronger than just to keep the gas in? A. That is not correct. 10

Q. Well take into account if you like the temperature stresses, that is the stresses induced by the change of the steel—the contraction of the steel subject to temperature and some of these others? A. Well, that is not so much as the handling stresses.

Q. If I have to put a pipe down on that desk and I do not anticipate that that pipe is going to be called upon to stand any stress by sagging from the horizontal and I have to put a weld in it it is not of such great importance as to the character of that weld as if I put it in and know it is going to sag six and one-half inches. A. You have to go just a little further before I can answer that question. The pipe if it is to be laid as you describe it and to carry thirty-five pounds pressure and be exposed to no other stresses or strains could have been made of a wall thickness of less than one-sixteenth of an inch and then a weld inside one-sixteenth of an inch wall thickness should be equal to that wall thickness under that condition. 20

Q. A one-sixteenth of an inch? A. Not necessarily a one-sixteenth of an inch but it would be as deep as requirements of that kind call for of the metal used. Therefore the reason for using a quarter inch pipe in this case was based on other considerations besides that of carrying a given pressure and in order to be fair to those considerations the weld should have approximately at least the same depth as the wall thickness of the pipe. 30

Q. That is to say the weld should be a quarter of an inch thick. Is that right? A. Yes.

Q. And do you suggest that that portion of the weld, that is a quarter of an inch thick, that is outside the wall of the pipe, has any special influence in giving that pipe greater strength? A. If the weld, a quarter inch deep or thick, was laid entirely outside on the outside surface of the pipe and did not penetrate at all it would have under certain conditions more strength than if it was in line with the walls of the two pipes. 40

Q. Let me go back to my exhibit. You observe here that where there is a solid plate containing a nick, and for the purpose of my question I am asking you to assume that a weld containing a nick is in the same basis as a solid plate containing a nick, is not given any rating at all? A. The rating that is given there is based on a solid plate with the defect of a nick in it and is not entitled to any rating.

Q. And do I understand you to say that a weld containing a nick has not the same weakness as a solid plate containing a nick? A. It has not.

10 Q. Now in the 1928 report of this same company in the introductory remarks I find this paragraph. He says: "There can be no doubt that the bulk of accidents that have occurred have been due to the welding having been carried out in a manner that no supervising authority could tolerate. For example butt welds with the weld metal not penetrating the full thickness of the plate." Now do you disagree with that? A. I would not disagree with that if I knew what he was referring to. He probably is referring to pressure vessels—tanks and vessels of that description, subject to high pressure, but he is not referring to pipes of small diameter.

20 Q. Well he certainly is referring to structures that are round and hollow, isn't he? A. I presume so.

Q. A pressure vessel that is round and hollow. What he says about that, what I have read "that no supervising authority could tolerate." A butt weld—which is the kind we have here—where the weld metal does not penetrate the full thickness of the plate. And I am asking you whether you will agree with me? A. It is difficult to answer questions on unrelated matter and reading abstracts where the witness does not know what it refers to. It does not give a witness a chance to use any judgment.

30 Q. Well take your time. "Fusion welded pressure vessels." I confess in my ignorance I thought that a gas pipe carrying thirty-five pounds pressure to the square inch would come within that category. But I am quite willing to be corrected if I am wrong. A. It evidently does not because we have codes for steel piping twelve inches in diameter running with one hundred and fifty pounds pressure or less where the type of weld found in this pipe is permitted to be used.

Q. Do you want to read the article? A. I should be glad to read the whole report.

40 Q. But I mean in connection with this paragraph. You are probably quite right that it is only fair to ask you—I have asked you whether you agree with that remark in connection with pressure vessels? A. As a rule with pressure vessels that would be correct.

Q. But I understand from you that you distinguish between a pressure vessel and a gas pipe carrying thirty-five pounds to the square inch? A. I distinguish between pipe and pressure vessels.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Cross-Ex-
amination
continued.

Q. But at all events we are away from the difficulty about hollow rounded vessels. The remarks certainly apply to that? A. But not to a pipe.

Q. You mention sixty-eight and one-half per cent. in your evidence in chief. That is per cent. of what? A. Of the strength of weld metal per square inch in relation to pipe metal per square inch.

Q. What I want to get at is, is the relationship taken of the pipe metal per square inch when the pipe is in pipe form or when the pipe is in coupon form? A. The figure used is the figures reported in Professor Cameron's report or test giving the strength of the pipe a certain value. 10

Q. But you see what I mean. You have drawn a distinction between this figure that Professor Morrison reported as being the strength of that welded joint which we will call fifty per cent. of the pipe material? A. Yes.

Q. And you say he took that out of the coupon? A. Yes.

Q. And the coupon was taken out of the rounded pipe? A. Yes.

Q. And you have drawn a distinction between the validity of that fifty per cent. and the weld when it was in the pipe—in the round pipe. Now what I want to know from you is when you took this sixty-eight and one-half per cent. do you compare that strength of the weld when it was in the pipe in the rounded form all the way round to the strength of the pipe material when it also was in the pipe form. or do you take it in relation to the pipe material when the pipe material was in a flat form—in a coupon form? A. You mean that pipe material specimen to be properly tested should have had a backing strip behind it to prevent it from bending which no doubt would have given it a slightly higher value but very slight. The reason for it being very slight is the nick as you call it, or the spacing bit in the pipe as I call it, on the specimen, with the welding in, is subject to different formation than the pipe itself would be. 20 30

Q. That is probably very learned. But what I want is an answer to my question if I can get it. If you do not know and you want to refer to the test that made you sixty-eight and one-half per cent. I am quite willing you should refer to it.

MR. SMITH: He gave you a very simple answer.

MR. WOODS: I do not think it was very simple.

THE COURT: Do I understand you to suggest or state that in your opinion Professor Morrison had left out one factor in his calculation which led him to give a different per centage from your sixty-eight and one-half? Was there one factor of it in the calculation not included? A. No, your Honor. He pulled the specimen in an abnormal way and got low results. 40

Q. Well then what is the difference between you and me in respect

to that? A. The only difference is that the specimen when pulled should have a support on its inner surface so it would re-act in a testing machine like if you tested a pipe as a whole.

Q. Then my word "factor" was intended to lead to this—that that answer to me would be an affirmative one to my question as to whether in your opinion he left out one factor in his calculation. Do you understand me? A. Yes.

Q. That factor being, as I understand it, if the whole of the pipe were tested there would be the same support that you have tried to demonstrate in the model you have put in? A. Yes, sir.

Q. Do I understand you right? A. Yes, sir.

MR. WOODS: Here is a round pipe such as we are dealing with and there has been a weld at the place where these two glasses join. (Illustrating with drinking glasses). And you have given evidence that that welded material at the place where the two glasses join is sixty-eight and one-half per cent. as strong as the pipe material in the pipe. That is what I understand you to say? A. Yes, sir.

Q. The pipe material in the pipe being the two glasses? A. Yes, sir.

Q. Now to get that sixty-eight and one-half per cent. did you compare the strength or the breaking strength or tensile strength of that welding material with the strength of the material in the pipe when it was in the form of a pipe; as these glasses are, or did you take that percentage by reference to the strength of that pipe material after the pipe material had been cut out in the form of a coupon and flattened out? Now do I make myself clear on that? Will you tell me? A. To begin with the coupon would not be flattened out prior to being pulled—

Q. At all events—

MR. SMITH: Oh, allow him to answer.

A. Except at the ends where the clamps hold the piece. The pipe coupon was pulled without any support as near as I can judge from reading the report. It was pulled in the same manner as the weld coupon was pulled. Under that condition there would be a slight bend in the pipe metal but it would be very slight because the stresses will go through the centre of the weld all the way through and the only bending that would take place would be due to the tendency of the specimen to straighten this out to a flat position and that action would probably slightly decrease the actual strength of the pipe metal but to a very small degree.

Q. If I have understood your answer correctly the figure that you compared the strength of the welding material with, was a figure of the strength of the pipe material when it was in the form of a coupon? Am I right? A. Yes, sir.

Q. Now as Mr. Smith asked Professor Morrison about this new idea

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Cross-Ex-
amination
continued.

I gather from what Professor Morrison said, that if the welded material was tested in that form, that is in the pipe form, when it was all in pipe form and the whole pipe drawn apart, and the pipe material was tested in the same way when it was in the form of a pipe— A. Yes, sir.

Q. That you would get exactly the same results with regard to the percentages as you would if the welding material was pulled in a coupon form to find the strength and the pipe material was pulled in a coupon form to find the strength? A. You should.

Q. And he found that when you took these welds and cutting a piece of pipe right down some three or four inches wide right down— he found that the strength of the weld as compared with the strength of the pipe material was fifty per cent.? A. Yes, sir. 10

Q. And do you then agree with me that if your testing experiments had been conducted in the same way with the pipe material as you have suggested it was conducted in connection with the weld you would have got fifty per cent. too? A. No, sir.

Q. And not sixty-eight and one-half per cent.? A. You would get probably a figure that might be a fraction under sixty-eight and one-half.

Q. Well why is that? A. It is a phenomenon you will find when that test is made. 20

Q. If the fact of the thing being in a rounded hollow shape strengthens the weld metal in the way that you have mentioned so as to make it such that you need a greater strain to break it why is it not equally true to the same proportionate extent with regard to the pipe metal? A. It would be true if the weld did not have a space between the two pipes on the inner surface of the pipe.

Q. Then actually that is not your space that is a benefit to the weld? A. No, sir.

Q. Is it a detriment? A. Not for the purpose it was to be used.

Q. And what was it to be used for? A. For carrying relatively low pressure. 30

Q. And intended to be laid and to sit in a horizontal position? A. Not necessarily.

Q. But Mr. Hill has told us it was intended to be in a horizontal position and to sit in it. Are you basing your answer on that? A. I am basing my statement on my own observation of what I have found there.

Q. And what you have heard? A. Yes.

Q. And what you have heard Mr. Hill say? A. No, not in this case because normally I would agree with Mr. Hill but I cannot. 40

Q. You cannot agree with him? A. Not from the standpoint that this pipe was exposed to no stresses beyond the pressure test or pressure stress.

Q. I do not think Mr. Hill said that? A. Well that is what you tried to convey to me.

Q. You said in connection with the sixty-eight and one-half that that does not mean that the joint had that relation? A. That is true.

Q. What do you mean by that qualification? A. The welded joint, if you took and drew a line through the centre of it, would have a certain area of weld metal. If you take the full area as was found by Professor Cameron of this broken weld and multiply that area by the strength of the weld metal per square inch you then have the full strength of the welded joint. If you take the pipe area and multiply that area by its strength per square inch you have the full strength of the pipe. If you compare those two areas, the welded joint was one hundred and seven per cent. of the pipe strength.

Q. That is taking the area only of the welded joint and comparing it with the area of the whole pipe? A. Of the whole pipe.

Q. Because in this particular case the weld did not go more than half way through the material? A. No but it extended out beyond and you have to take the full area of it.

Q. What was the proportion of the area of the welded metal to the pipe metal? A. Well if you will allow me to look in my records I can give you the actual figure, but I don't remember. The total area of the welded joint at the line of intersection between the two pipes was 13.923 square inches. The pipe has an area of 9.032 square inches. The area that was used in my testimony yesterday of the welded joint was based on the depth of the welded joint as found in the break and multiplying that depth by the circumference of the joint we get an area of 10.613. On the basis of the smaller area the welded joint was eighty-two and two-tenths per cent. the strength of the pipe. On the basis of the full area as found the strength of the joint was one hundred and seven and eight-tenths per cent. of the strength of the pipe.

Q. And that is just taking into account the areas you have mentioned. You are not taking into account in connection with that what Professor Morrison has called the stress concentration due to the presence of the notch or "V"? A. You cannot take stress concentration into consideration in measuring the areas but only when measuring stresses. Yesterday I made a statement that I agreed with Professor Morrison in his testimony that at the junction between the open space and the weld metal there was a concentration of stress. That concentration of stress as near as we can figure it or as near as we can judge it, because there are no figures available, would be about fifteen per cent. of the strength of the weld metal. In other words, the weld metal made from a low carbon rod as used in this case should give a strength per square inch of about 45,000 pounds. The test gave a strength of 39,000 pounds. Therefore obviously the loss between 45,000 and 39,000 pounds was due to the concentration of stresses at the point mentioned.

Q. Now Mr. Ewertz, I don't know whether you are familiar with this treatise? A. No, I am not.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Cross-Ex-
amination
continued.

Q. But I suppose you would agree with me that a text book of that character coming from the Cambridge University Press by these very eminent people as described is probably an authoritative work? A. It may be theoretically but not necessarily practically.

MR. SMITH: I did not object to the advertisements of the insurance companies that were quoted as authorities but I submit if we are going to have authorities they must be recognized or proved.

MR. WOODS: Will you take a look at that diagram at page 597?

MR. SMITH: We might even learn the name of the book.

MR. WOODS: It is a treatise on Photo Elasticity by E. G. Coker, 10
M.A., Member of the Institute of Civil Engineers and Member of the
Institute of Mechanical Engineers and L. M. Fillon, Professor of Applied
Mathematics and Mechanics in the University of London and Univer-
sity College and Director of the University of London and London
Observatory. And the date of the publication is 1931, from the Cam-
bridge University Press.

THE COURT: Now what is the rule about the use of these books
in cross-examination?

MR. SMITH: Well my Lord, it must be either admitted by the 20
witness as an authority—

THE COURT: And he does not admit it because he does not know
about it.

MR. SMITH: Or it must be otherwise proven. These chaps may be
marvellous fellows. London University I think is a corresponding school
—Geological.

THE COURT: I do not know that the London University bears
that criticism.

MR. SMITH: In its geological courses.

MR. WOODS: The witness puts in a statement that concentration
stresses account for fifteen per cent. and where I have any text book 30
that is not obviously a fraud, I can read from it and say "do you agree
with that statement?" I am entitled to cross-examine in that way.

THE COURT: My present view is that is not the correct view
about the use of text books in cross-examination. If it is, it rather sur-
prises me. But if you like I can look it up and adjourn for a few
minutes, but I do think you have no right in cross-examination to read
to the witness from a book which has not been proved as an authority
or which the witness recognizes as such.

MR. WOODS: I will bow to your Lordship's ruling. You may be quite right.

THE COURT: On the other hand you can doubtless let the witness read it and look at it and then see whether—

MR. SMITH: You mean read the thousand pages?

THE COURT: Oh I think he will take care of himself.

MR. SMITH: Well I have no doubt of it. Seeing advertisements of an insurance company were used—

MR. WOODS: That is not right.

10 THE COURT: I think the word "advertisement—"

MR. SMITH: Yes, exactly.

MR. WOODS: I am asking you to look at that book. I am not going to read the part to you. But I am asking you to look at this very problem discussed at page 596 of this book that I have mentioned with relation to the diagram at page 597 which I think, as you will see upon examination, is a discussion of stress concentration in relation to such a "V" notch as you mentioned in your recent answer to me. Now will you look at it and tell me— A. I cannot tell you from looking at a diagram at all what it means unless I read the history that goes with it.

20 And further than that, may I say that while I probably will be willing to recognize the authority of this book, as I recognize the gentleman who has written this book as being thoroughly familiar with the subject he has written about I still think there are others who have an equal knowledge and who can definitely state facts as are found from time to time.

Q. Will you be good enough to look at it and apply your mind?

A. No, I will not because I cannot from looking at it reach any conclusions.

30 Q. Can you tell me by looking at what I pointed out to you whether there is a discussion on this particular subject? A. I could not.

Q. Are you a University man? A. I am.

Q. You are a student. You read technical books of this character?

A. To the capacity of my time.

Q. There are one or two diagrams there and a paragraph or two and I am asking you to read it and tell me whether—not to read it aloud but to apply your mind to it and tell me whether it is a discussion of this very thing by people who at all events are theoretically entitled to speak?

40 MR. SMITH: I think my friend's words are a discussion of this thing.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 55

Eric Harold
Ewertz
Cross-Ex-
amination
continued.

MR. WOODS: Will you do that, sir? A. I will if your Lordship will permit me to take an hour or two's time to read sufficient of it so I can be familiar with what these learned gentlemen are writing about.

THE COURT: Do you wish me to do that?

MR. WOODS: I ask leave to put a question to the witness referring to the book before him referring to the documents before him and the conclusions come to by the author of the book with relation to this very matter he is speaking of. I ask to be allowed to ask him whether he agrees with that. There is such a startling difference that it seems to me to be useful to the Court to know it. 10

THE COURT: Well the witness says he would need an hour to consider the matter. It is rather refreshing to find an expert witness who asks for and desires and requires time before giving an opinion. Do you want me to adjourn?

MR. WOODS: No. I am asking your Lordship in view of what the witness has said and what my friend has said to ask him with regard to this matter, as to stress concentration as explored in the examples shown in this book.

THE COURT: He says he does not desire to give an opinion either in agreement or opposed to what you say is in that book without at least an hour's consideration of the book and of the material that you are putting before him. 20

Q. MR. WOODS: Do you think you would be able to give an opinion on it after you have an hour's consideration? A. I might.

Q. You don't know. A. I cannot tell before I read it.

Q. One or two other matters. You spoke recently about there had been a practice developed of putting a—I gather it was in connection with welding—that now they often put some object behind the pipe so as to give the welder more confidence in putting his weld metal all the way through? A. Correct. 30

Q. I think that is now called a liner or a sleeve? A. No. Liners and sleeves have definite functions. This is merely a strip put inside to create that confidence.

Q. Take this pipe we are discussing. It is now I gather a practice in order to give that welder confidence to put something behind the place to be welded on the inside of the pipe so that he can with confidence go through the pipe with his weld metal without leaving any protuberances on the inside? A. Yes.

Q. So that I take it from that it is desirable he should go through the pipe with his weld metal? A. That is the standard for certain types of pipe joints. 40

Q. And do I understand you to say that in this particular kind of

pipe joint that we are dealing with here that it was not desirable that the welder should go through the pipe with the welding metal? A. It was not necessary and therefore they used the other form.

Q. I used the word "desirable?" A. It was not even necessary.

Q. I am only concerned with whether it was desirable that he should or not? A. No.

Q. Having regard to the use that the pipe was intended for? A. Yes, sir.

10 Q. And having regard to the possible stresses to which it might be subject? A. Yes, sir.

Q. In the anticipation of the person who put it down? A. Yes.

Q. And that is Mr. Hill? A. Yes.

20 Q. Now you used in the same connection there the figure of "fifty feet." You said you arbitrarily assumed fifty feet. I understood the word arbitrarily to mean that you established a fifty foot span but that you did not intend to indicate to the Court that that fifty foot is necessarily correct. But you had to take in a certain amount of rigidity in the pipe at the dresser couplings and you assumed for the purpose of your calculations that that rigidity absorbed some thirty feet of the pipe. Is that right? A. Yes. Fifteen feet at each end.

Q. But it was a purely arbitrary assumption on your part? A. Yes.

Q. You don't need to indicate it might be fifty or seventy feet or seventy-three and one-half feet or something of that kind? A. I mean to indicate it could not have been very far away from the fifty feet in order to produce the results that was found.

RE-EXAMINATION BY MR. SMITH.

30 Q. My friend was reading to you from the British Boiler Electrical Insurance Company Limited Technical Report. I am looking at page 15 of this report for 1928 and I observe this paragraph: "Although it is possible to produce a butt joint the strength of which when reinforced is equal to or even slightly greater than that of the plate itself there are so many uncertain elements in a welded joint that under no circumstances can a butt welded joint be credited with more than half the plate strength, the reduced figure being referred to hereafter as the rated strength."

Q. Now even taking the figures of Professor Morrison's of fifty-three per cent. we come well within the specifications of the technical report for 1928 of the British Engine Boiler Electric Insurance Company Limited. There is no doubt about that? A. Apparently so.

40 Q. Now I want you to go back to this notch of which we have heard a great deal and about which there may be some confusion. I am not sure whether his Lordship understands. I am looking for that little sketch and at the risk of perhaps repeating I wonder if you could make

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Cross-Ex-
amination
continued.

Re-Exam-
ination

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Re-Exam-
ination
continued.

it plain what you mean by the concentration of stresses themselves causing the break to come outward from that notch at the inside of the pipe (referring to Exhibit 81)? A. The stresses that pass from one end of the coupon to the other end of the coupon travels along parallel or approximately parallel with the surfaces of the coupon until it reaches the weld metal. There by virtue of the fact that the weld metal does not go through the full thickness of the pipe he has a space there, the stresses would normally go through in the section of unwelded pipe; if it was welded they are compelled to go up and go through just above that unwelded section and therefore at that particular spot there are more stresses than there are in any other section of that weld. That is more stresses than if you say per given dimensions of the distance they would go through the weld up here as related to down here (indicating). That is concentration of stresses. 10

Q. And I think in that you and Professor Morrison are in agreement? A. We evidently are.

Q. And in order that I may perhaps better understand what is the effect of that if you can put it in percentages in any way — A. Well the only way that it can be put in percentages is to first establish the value of the weld metal per square inch where it is exposed to no other stresses than the tensile stress. I have stated that probably a weld made with a rod that was used in 1923 when this pipe was welded would under proper manipulation probably give a strength of around 45,000 pounds. It may be higher. It is, however, in this case rather immaterial what it is because in the coupon pulled the concentrated stresses were present and therefore when the welded joint broke the stress that it broke with—39,000 pounds—was the stress that was left to pull apart the specimen with. In other words it was concentrated stresses centred at the one point. They became effective when the weld had reached a point where the elasticity of it ceased to function. At that point the break would start from the inside at the stress concentrated point and go out. Obviously when the specimen was pulled it took 39,000 pounds to break it. Therefore we are justified in assuming that the weld metal of the joint as found in this pipe was equal to 39,000 pounds per square inch. 20 30

Q. That we know that actually— A. That we know from actual test.

Q. And the amount that you might anticipate from weld metal as from rods used in these days, would be about 45,000 pounds? A. Yes, sir. 40

Q. Now you were asked something about pressure vessels and in my amateurish way it occurred to me my friend might be using articles and quotations with regard to the factor of safety. In this job here you have already said that a one-sixteenth of an inch pipe insofar as maintaining the gas only at forty to forty-five pounds would be sufficient for that purpose? A. Yes, sir.

Q. But we have used a quarter inch pipe? A. Yes.

Q. And you have already given us the area of the weld? A. Yes, sir.

Q. Now leaving out stresses to the pipe as laid in the ground and handling and so on, thinking only of the pressure of the gas, the purpose for which the pipe was used, what margin of safety have we in this particular case, in what percentage? A. Well if a quarter inch pipe showed a strength of 56,000 pounds a pipe one-sixteenth of an inch of the same material would pull one quarter of that which would be some-
 10 where around 14,000 or 15,000 pounds. If you take the area of a pipe twelve inches in diameter with a one-sixteenth inch wall—I think that would be a better way to reach it—the area of it would be approximately one quarter of the area that I quoted here a few minutes ago. If you take that new area and multiply it by the strength of the pipe metal you get the strength of the joint of a pipe such as would be found in a wall one-sixteenth of an inch. If you compare that with the welded joint as found—the strength of the pipe with a quarter inch wall say 513,921 pounds. Therefore it would be fair to assume for quick determination of figures that a one-sixteenth of an inch wall pipe would be
 20 a quarter of that, which will give a strength of slightly under 120,000 pounds. And if you compare that 120,000 pounds again with the minimum welded joint strength given you will have about three hundred and fifty per cent. strength of the welded joint.

Q. Now in dealing with pressure vessels is the factor of safety or the margin of safety one of the chief considerations in dealing with those vessels? I mean having regard to welding? A. Well in design in general we have always a margin of safety which makes up for unknown stresses and errors that creep into all calculations.

Q. And is there any figure at which the pressure vessels stand? A.
 30 In the Pressure Vessels Code there are several classifications based on the service the vessels are to render and the margin of safety is increased in proportion to the danger of service of a given type of vessel.

Q. In high pressure boilers going up as high as what? A. Well we have boilers running as high as 35,000 pounds pressure. I imagine the margin of safety of that would be probably up around at least 10,000.

RE-CROSS-EXAMINATION BY MR. WOODS.

Q. My friend read you this paragraph: "Although it is possible to produce a butt joint the strength of which when reinforced is equal to or even slightly greater than that of the plate itself there are so many
 40 uncertain elements in a welded joint that under no circumstances can a butt welded joint be credited with more than half the plate strength, the reduced figure being referred to hereafter as the rated strength. That, unfortunately for the welder, handicaps him in making use of what

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Re-Examination
continued.

Re-Cross-
Examination.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Re-Cross-
Examina-
tion.

continued.

otherwise might be a far cheaper process than rivetting and one with a special advantage where a tight seam is an important consideration."

And over the same page, dealing with the same matter: "For longitudinal joints of the types considered the ratings will be credited when the design complies in all respects with the rules as shewn in Figure 'A'."

And here is Figure 'A' and here is your longitudinal joint, and whether it is welded at both sides of the plate or welded on one side of the plate in a butt joint the welding material must be at least ninety per cent. of the strength of the pipe material. Now that does not justify the remark that my friend made to you and with which you apparently agreed that the weld in this case complies with the requirements of the British Engine Boiler and Electrical Insurance Companies Code? 10

MR. SMITH: I said above their rating.

MR. WOODS: You are not within forty per cent. of their rating.

MR. SMITH: I think we are.

THE WITNESS: I presume when a question of that kind is asked it is fair for the witness to also assume that what you are talking about is directly related to the matter before him to testify on. Evidently a great many of the quotations made here today have no reference to pipe welding. 20

Q. MR. WOODS: The part Mr. Smith read to you and which I am endeavoring to correct had no reference to pipe welding? A. I do not know, but evidently it has not. I cannot tell.

Q. It refers to longitudinal welding? A. Well you can have longitudinal welding in pipes.

Q. You agree it has not anything to do with it? A. I agree on that the same as I agree on most quotations made.

Q. I do not know whether you told me of the statement of this book "Design Standards for Oxwelding Welding Steel." Do you recognize that? A. Yes. 30

Q. It is good practice? A. It is a book issued by a concern that sells welding equipment—apparatus, gas and such things.

Q. And what it would say in regard to welding is entitled to some weight? A. Not necessarily true, but it may be advertising.

Q. May be advertising? A. Often the case.

Q. I am referring you to this part of it, and see whether you will agree with this. Certainly this refers to wrought iron pipe.

MR. SMITH: I am making my same objection before you use this book.

Q. MR. WOODS: There is a part of it that refers to the welded line joints. You see that? A. Yes, sir. 40

Q. And then he goes on with the explanation and then he lays out a specification, "When the open single "V" butt weld is specified the following should be included in the specifications." And the section is, "Welds should be thoroughly fused at the joint and the ends and extend completely to the bottom of the "V"? A. Yes, sir.

Q. And the sixth one: "The weld should be of sound metal free from labs."

MR. SMITH: I do not know whether I am supposed to hear this or not, but I am sorry I could not hear it.

10 Q. MR. WOODS: "Gas pockets, slag inclusions and other defects." Those are two of the specifications that you would think would be reasonable specifications? A. For that type of joint.

Q. And that type of joint has to do with wrought iron piping? A. Yes, and so has the other type that has been used here.

Q. And in connection with wrought iron pipe or steel piping too? A. Yes.

Q. In connection with steel pipes it would be reasonable if you were making specifications to require that the weld should be thoroughly fused to the joint and the ends and extend completely to the bottom of the "V"? A. Only if I decided to use that type of a joint.

Q. MR. SMITH: You will observe this is a publication of 1930? A. Yes, sir.

No. 56.

Evidence of Robert Starr Leigh Wilson.

ROBERT STARR LEIGH WILSON, being called as a witness on behalf of the defendant and having been duly sworn was examined by Mr. Smith and testified:

Q. You are Dean of the Faculty of Engineering at the University of Alberta? A. I am.

30 Q. And are you a graduate of an engineering school? A. Graduate of McGill.

Q. In what year? A. Nineteen-eleven.

Q. And after graduating from McGill, in what sort of engineering? A. General Civil Engineering practice—very varied.

Q. And after that what did you do? A. I resumed teaching and carried on some outside engineering activity as well.

Q. What engineering activity have you engaged in? A. My activities date back to my undergraduate years. There was an interruption to my university career of five years which was spent wholly on engi-
40 neering work of one sort or another.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 55
Eric Harold
Ewertz
Re-Cross-
Examina-
tion.

continued.

No. 56
Robert
Starr Leigh
Wilson,
Examina-
tion.

Q. MR. WOODS: What is he called on?

MR. SMITH: I am calling him wholly on the subsidence question. I am not going to ask him about welding.

Q. What sort of engineering work were you doing? A. I was on one of the earliest works, one of the earliest works was the construction of the C.P.R. Angus shops in Montreal in a very junior capacity, of course, in 1903; and following that I was on a railway maintenance of way; later on railway construction involving rock work and plenty of earth work; and following that surveys mostly for railway purposes; and following that with concerns engaged in general contracting where they were carrying on municipal works among other things in Regina and building works. 10

Q. What year was that? A. Nineteen-twelve to 1915 in Regina. And later on general construction work in Montreal. At the same time I was engaged—

MR. WOODS: With all this I doubt whether he is competent to speak—

MR. SMITH: I want to show what experience he had with earth. I am going to ask him.

A. Incidental to the general construction work both in Regina and Montreal almost always there were problems in foundations involved which has to do of course with the behavior of earth and certainly in the railway construction nearly all of one's activity there is around the general behaviour of earth work. 20

Q. And I want to know have you had long experience and have you made a study of the behaviour of earth? A. Yes.

Q. Including rock? A. And rock, yes.

Q. And what year did you join the University of Alberta? A. In 1919.

Q. And you have been at the University ever since, I think? A. Yes. 30

Q. Now you knew of the Corona Hotel fire? A. Yes, sir.

Q. And you learned of a break in the gas company's twelve inch line roughly at the centre of 107th Street at a weld? A. Yes, sir.

Q. And were you commissioned soon after that? A. Within two or three days.

Q. And what was your commission? A. To carry on a general investigation to determine the cause of that break.

Q. And have you put in any time on that matter since then? A. Decidedly, yes. 40

Q. And were you given a free hand to make such investigations as you saw fit? A. Yes, and to associate others with me in the work.

Q. And you have had associated with you Dr. Cameron? A. Yes.

Q. I believe you have received every courtesy from Mr. Haddow?
A. Yes.

Q. And those at the City Hall with whom you had to consult? A. Yes.

Q. And have you made an exhaustive study as to the cause of that break? A. We tried to.

Q. And have you made in the course of that study—have you conducted experiments and made calculations? A. We did.

Q. Many? A. Indeed, yes.

10 Q. And, if anyone is interested, have you the details of those experiments and those calculations here? A. We have them here, yes.

Q. And I take it that you then put into the form of a report the material which you had examined and the conclusions at which you arrived? A. We did. The report is in sections dealing with the many aspects of the whole problem as we saw it.

Q. And have you that report with you? A. I have.

Q. I am going to ask that the witness be allowed to refer, as he is advised, to his report.

MR. WOODS: I do not want him to read the whole report out.

20 MR. SMITH: Oh do not worry. I am not going to subject you to what I have been through. Now you have listened, not as much as most of us, from time to time to the evidence given in this case? A. Yes and have read some transcripts.

Q. And I am referring particularly to the evidence of Mr. Haddow and a portion of that you did not hear and it was transcribed and you were able to read it? A. Yes, I have read most of his.

Q. And I think you have heard the evidence given by Professor Morrison? A. Yes, in part.

30 Q. And you have been unable to be here all the time? A. Yes, because I have been carrying on my university duties.

Q. And did you hear the evidence of Mr. Ruff? A. I read it.

Q. You had a transcript of the evidence of Mr. Ruff. I mean his evidence as applying to this ground and the ditch at that point? A. Yes.

Q. And were you at the place in question in the month of June when the pipe was raised? A. I was occasionally.

Q. And I mean were you in a position to see the soil under the pavement in the exposed trench? A. Yes.

40 Q. Now, Dean Wilson, I want to ask you if you have formed an opinion as to the cause of the break in that pipe? A. An opinion regarding the break itself. Is that what you mean?

Q. Have you formed an opinion as to the cause of the subsidence of the pipe? A. If we start from the point that the pipe has been strained to a breaking stress, and I take it you do not want me to go back of that for the time being—

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56
Robert
Starr Leigh
Wilson,
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56
Robert
Starr Leigh
Wilson,
Examina-
tion.
continued.

Q. Now I have brought you there. Now you might just explain.
A. The manner of the occurrence of the break in that pipe is such as to warrant at once this conclusion, that the pipe was broken in bending. The manner of bending was that the pipe was bowed downward. The extent of the bowing will depend upon what span length you care to consider. On the seventy-seven foot span, which is the distance fairly closely between Dresser couplings, we have a deflection which is the deviation from the straight downward—we have a deflection of the order of six inches or so. The pipe was capable of receiving pressures from earth above it and pavement and would have remained on the line to which it was laid if there had been continuously, speaking from the point of view of time, if there had been continuously a sufficient support beneath it; that, for some reason or other this support became insufficient is quite apparent from an examination of the whole situation. The manner of the bending of the pipe I would suggest, can be thought of like this—a pipe without any earth on top of it and seventy-seven feet long and hanging suspended between two supports at the end will take a certain curved position. In fact, a pipe with any kind of a load on top of it, so long as the load is uniform and supported at only two points, will take a very regularly curved position. The pipe under ground—imbedded in ground—where ordinarily there will be always some deviation from absolutely uniform supporting pressure unless very very special precautions are taken against it, will be affected in the matter of curvature so as to tend to make the irregularities of curvature of the pipe obey the rules imposed on it by any irregularities in the supporting pressures from below. Now this pipe was found with the break at the centre—at the middle of its length—and when seen, the profiles that were taken of it as shown on exhibits already in, indicated that from the two ends at the Dresser couplings there were approximately a “V” shaped inclination towards the fractured section of the pipe. Attempts to determine the curvature of the pipe we found to be useless. That is by any direct measurements because the fact of the fracture and the uncovering of the pipe allowed for a considerable freeing from stress of the broken pipe. So that as the pipe was first exhibited, we were quite unable to get a really close approximation to what was the shape of that pipe just at the moment of fracture, with this exception that at the point of fracture quite certainly the pipe had a considerable bowing. Now I would confine that to the statement that the radius of bending there was small as compared with the radius of bending or curvature at most other points in the pipe. The cause of this bent shape of the pipe just at the moment before fracture, in my opinion, must be attributed to this—a tunnelling operation had been carried on incidental to the construction of the fifteen inch relief sewer between manholes “A” and “B”. That tunnelling operation affects the surrounding volume of earth. In spite of the fact that earth backfilling is used there to close up the aperture between the outsides of the fifteen

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inch tile pipe and roof of the tunnel, there is some difference,—a very considerable difference—in the pressure transmission powers of the top of this backfilled material in the tunnel and the original earth which had been removed in order to have the tunnel. In other words, tunnelling operations involved this, the two sides of the tunnel and the roof of the tunnel, and even in the floor to some extent, but which I do not think is material to the point in hand, but certainly at the sides and the roof the removal of the original earth from that space meant that there was a release of pressures which had theretofore existed. A release of pressure

10 from any face or from any plane of such material allows the material to extend itself towards the direction from which the pressure has been removed. Sometimes the release of pressure amounts to so much of the movement of the earth above and beside the tunnel—amounts to enough to cause cavitation; that is, the dropping away of the portion releases roof material and sometimes from the sides of such a tunnel. Another phase of the thing is that the digging of this tunnel and the replacement of void spaces or filling of void spaces at the end of the laying of the tile, by material which is less compact than the original unbroken ground, disturbs the moisture equilibrium of that surrounding ground, and facil-

20 itates to some extent the escape of soil moisture through this newly made channel, that is into the tunnel and contained backfill and along the outside of the fifteen inch tile pipe. An abstraction of moisture tends to make the moisture content of that ground average less than it had done before this tunnelling operation. In consequence the ground shrinks somewhat. The third factor is the caving or bodily movement of bits of earth and the carrying of silt and fine material through any crevices or cavities that may form in this disturbed ground. Percolating water will vary in amount from time to time depending upon the incidents of rainfall and other such events and any percolation or trickling of water

30 through crevices, cracks or cavities will contribute to the removal of some of the original earth volume which lay between the twelve inch gas main and the tunnel beneath. Some of these three factors, in my opinion, make for this sort of condition—that at some point centering at the weir box, and in that end of the tunnel, we have an action along the lines I have described which extend upwards and outwards. The direction of these effects or the direction of an enclosing surface which might contain all the affected ground, cannot be easily described. It certainly is something more than the volume contained vertically above the disturbed area below. It is certainly something less than infinity, which is an absurd

40 way of putting that, perhaps. But an intermediate estimate would lie, I should suggest somewhere about forty-five degrees.

Q. And speaking of that forty-five degrees, has it a tendency as it approaches the surface to vary? A. Oh yes. It does not go straight up that forty-five degrees, according to the theories of behavior of ground water which apply in a little way to this thing in mind. The shape of that

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56
Robert
Starr Leigh
Wilson,
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56

Robert
Starr Leigh
Wilson,
Examina-
tion.

continued.

would be a funnel—a curved funnel, convex upwards tapering out as it came to the top. It would start closely vertical and change its slope gradually as it comes to the top—a sort of dimple shape volume. The effect of this is to make for a tapering subsidence along some length of the pipe which centres very closely at the weld which was found broken. As nearly as one could estimate the conditions that existed just immediately before fracture, the support was removed from the pipe due to the subsidence and increasing in amount starting at a point about the weld and decreasing in amount out to some distance each way from the fracture, this distance not being capable of very accurate estimate. From an investigation of the mechanical properties of the pipe as it was before the fracture, it is likely that this extent of this subsidence which had a marked effect in putting the bow into the centre of that pipe would be of the order of—I am sorry to be so wide in this range—of the order of twenty-five, thirty-five or maybe forty feet. That is centered on the weld. That length is centered on the weld. 10

Q. And what did you next do? A. We went into the matter of other causes of stress in such a pipe. There is the matter of temperature stress and the matter of bond stress. That is, bond stress between the earth and the pipe surface; the holding power of Dresser couplings and the possible action of frost on the pipe. 20

Q. And did you make calculations and experiments to arrive at what the forces represented in pounds per square inch? A. We did. Yes we did definitely. We made calculations. One will have to qualify them of course at the appropriate points.

Q. Would you take these one at a time and tell us in simple language what you did and what you arrived at? A. The matter of temperature stress in the pipe metal amounts simply to this, about one hundred and ninety-five pounds per square inch pipe metal stress per degree Fahr. variation in temperature, if there is no freedom for expansion or contraction in the length of pipe. 30

Q. And carrying that forward, what does it mean? A. It means that under summer conditions. I had better link that at once with bond conditions in unfrozen ground. Under summer conditions the bond between earth and pipe metal seems to amount to certainly not more than one and one-half pounds per square inch of contact surface. I have the figures all here which can easily be checked later; and without going through the detailed calculation at this time, we arrive at the conclusion that the effect of bond stress when there is no frost in the ground is insignificant. I have forgotten the actual figures but I think it is two thousand pounds. This matter of bond strength and temperature stress are linked together, necessarily. And the contraction stress for a temperature drop of sixteen degrees Fahr. is two thousand seven hundred and seventy-two pounds per square inch. And this, according to a bond strength of one and one-half pounds per surface inch in contact between the pipe and 40

the ground, is the amount of that one and one-half extended on to the earth of the length of seventy-seven feet and the consequent stress into the quarter inch pipe metal. So that at a sixteen degree drop of temperature the bond must necessarily be broken if the Dresser coupling functions.

Q. And why did you take that sixteen degrees? Did you make inquiries as to earth temperatures or gas temperatures? A. We have a record extending over the better part of the year following the destruction of the hotel—gas temperatures.

10 Q. Gas temperatures, which would be pipe temperatures? A. Yes, and earth in contact with the pipe temperatures and gas temperatures and surface temperatures.

Q. Why did you use the sixteen degrees? A. The sixteen degrees happens to be the drop in temperature which will put such a stress into the surrounding soil as to destroy its bond and allow the pipe to adjust itself.

Q. In the Dresser coupling? A. Yes.

20 Q. Just go on from there please. A. The bond strength at temperatures below freezing point has been determined experimentally on very small lengths of steel, it is true, and the maximum figure we found there was one hundred and eighteen pounds per square inch on a length of steel rod imbedded in tightly compacted earth and then subjected to temperatures approaching zero. Other experiments on different lengths of bars gave us values, all of them below one hundred and eighteen pounds, as low as—one of the low figures is sixty pounds. We used one hundred and eighteen pounds in a calculation we attempted.

30 Q. You used the maximum figure? A. Yes. These experiments were really to determine, not detailed figures, but rather to determine the kind of bond stress—the order of thing involved in whatever bond exists between frozen ground and pipes.

40 Q. And what sort of a calculation did you make and with what results? A. We applied figures obtained in that way; took into account additional known physical properties of steel expanding and contracting and arrived also at a temperature co-efficient for frozen ground. Taking these things into account, we found that the effect of temperature drop from a temperature already at or below the freezing point would be to put the pipe in compression since the ground tends to shrink faster than does the steel of the pipe. The amount of that compression for a drop of twelve and one-half degrees amounts to some two thousand five hundred and forty pounds per square inch. The twenty-four and one-half degrees Fahr. was taken to be the actual temperature of change from liquid to solid of the moisture content of the ground, as it is a well known fact in spite of the popular notion that thirty-two degrees Fahr. is freezing point for water, that actual ground water freezes at something below that, which is about twenty-four and one-half degrees. And we take the low

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56

Robert
Starr Leigh
Wilson,
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56
Robert
Starr Leigh
Wilson,
Examina-
tion.
continued.

end of that length, twelve degrees Fahr. in order to agree with the lowest recorded temperature of gas at one of the stations in the system here during the following winter. I think that is in Mr. Garrett's evidence.

Q. It was a test of the actual gas taken at the lowest point during the following winter? A. At one stage of lowering temperatures below freezing point in the ground and pipe there is no direct relation between the stress in the pipe and the stress in the ground until one or the other breaks, and if a volume of ground contains an imbedded pipe, both the ground and the pipe being held rigidly at the two ends so as to prevent an abnormal contraction with temperature drop, at some stage a tension is noticed in both the ground and the pipe which will if the temperature drop becomes sufficient cause a tension failure in either pipe or the ground. Frozen ground will have some strength in tension, markedly less of course than that in steel and for lack of any better information we have taken into account a tensile strength of frozen ground not greater than the tensile strength of ice which according to some proper authority is about two hundred and fifty pounds per square inch. 10

At 12:30 Court adjourns till 2:00 p.m.

At 2:00 p.m. Court resumes.

Q. When we adjourned at noon we were discussing the frost effect in ground upon the pipe. I wonder if you could now bring that to a conclusion, is this a convenient time, and tell the Court the result you found as to what those things meant in the conditions we have in 107th Street? A. Yes, and to summarize to just a very short degree. The stress which might be induced in the pipe metal due to bond between the pipe metal and frozen ground and due to temperature changes, in my opinion, amounts to two thousand seven hundred and seventy-two pounds, the latter part of that figure being for identification purposes rather than with any idea of it being of any real value. In frozen ground the condition we found there varied from a compressed stress in the pipe due to lowering temperature bonded to frozen ground, which was also lower in temperature—amounted to as much as two thousand five hundred and forty pounds, and when there is no bond between the frozen ground and the pipe by reason of something giving somewhere, the tension that might be put into the pipe metal amounted to as high as two thousand one hundred and twenty pounds. This takes into account a temperature range below freezing point which, according to my best information, is actually at twenty-four and one-half degrees Fahr., a drop down to twelve degrees above zero Fahr., that twelve degrees having been obtained from about a year's records including the winter following the fire. Another phase of stress which might get into that pipe is dependent upon the behavior of the Dresser coupling. According to our experiments, I find that the maximum possible stress which might be put into the pipe 20 30 40

when the pipe is being laterally dragged past the rubber gasket in the Dresser coupling might amount to as much as five thousand four hundred pounds per square inch pipe metal stress. That concludes the investigation of stress due to other things than bending.

Q. Have you totalled those or is this an appropriate time— A. It is not worth while totalling them. I think the five thousand four hundred could be taken—my offhand impression is that the five thousand four hundred pounds per square inch would represent the maximum possible at one time due to these various causes I have already dealt with. Now
 10 the next and important aspect of the problem that was presented to us was the effect of being subjected to ground action by reason of frost other than those already dealt with. And in this connection one takes into account the well known expansive property of moist ground and the short period when freezing—when change from liquid moisture to solid ice in the ground occurs. Volumetric dilation of ice is of the order of nine or ten per cent. over that of the unfrozen water, that is ten volumes of water will freeze into about eleven volumes of ice. Due to this property one naturally wonders what would have happened with frost penetrating the ground towards the pipe lying about three feet below it. And the
 20 sort of thing that I thoroughly believe occurs there is this, the early penetration of the frost establishes in what was previously moist ground a slab which extends across the trench or across the top of the backfilling or whatever filling was put in that trench, directly under the pavement and becomes tied to the frost crust on top of the adjacent undisturbed ground. The property of dilation during the freezing process produces pressure, certainly laterally, and unless relieved from anything to press against, vertically. If there is nothing to press against, if there is nothing to restrain this vertical dilation, something happens in the way of the change of volume. And I think I know that what happens there is that
 30 the crust is a little greater in its vertical dimension after freezing takes place than the same body of ground, now in the crust, was before. But because of the fact that the slab of frost is extended beyond the sides of the trench, this slab action can only satisfy itself in the matter of vertical dilation by leaving the under side of that slab in contact with the undisturbed ground where it was.

Q. MR. WOODS: What? A. Leaving the end plane of that frost slab where it was. That means that the dilation would take place vertically upwards, what I am coming at is that this dilation effect in undisturbed ground that has never been tampered with by man, there is a
 40 tendency to extend the surface upwards. Just at the under side of the slope where the frost is forming it is true, in my opinion, that there is some compression there on any ground which is less compact than virgin soil. The extent of that movement into uncompacted or loose compacted ground is, in my opinion, very trivial and could not possibly have played any important part in contributing to the forced bend in this pipe. For

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56
Robert
Starr Leigh
Wilson,
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56

Robert
Starr Leigh
Wilson,
Examina-
tion.
continued.

lack of being able to make any computations as to just what might be involved there, I rest my opinion in part on observations over some years of experience in running levels over bare ground.

Q. MR. WOODS: Will you speak louder, please. A. In part, I rest my opinion on experience gained in the district of Montreal and in Central and Northern Ontario where on numerous occasions I had to run levels over the same ground time after time through fall, winter and practically all year round conditions. And I am quite certain that if there had ever been a general uplift of the ground level of the order of one inch where the frost penetrates for distances of four, five or six feet, I am quite certain I would have noticed it. I have noticed minute raising of the ground level after frost penetration as is instanced by such things as a garden gate which fails to close without scraping the walk under it after the frost has gone into the ground, but the amount of uplift there would be fairly minute in order to make a scraping interference. I think that covers all that aspect of the thing. 10

Q. MR. SMITH: Are you coming to the question of the movement of soil, underneath a pipe or is that a separate—you have heard the evidence here? A. I have dealt with that in the early part of my evidence when I described the three types of things. 20

Q. What I have in my mind, was something was said here about this soil, being of a plastic nature owing to the jacking action of the frost, the material would be forced up? A. Oh yes.

Q. Is this an appropriate place to discuss that? A. Oh yes. It might very well be taken here. Continuing this frost crust down to include the material lying above the pipe and the material surrounding the pipe and under the pipe. At some stage in the progress of frost penetration towards the top of the pipe, we arrive just about the time when contact between the frost crust and the pipe is to be made, when, whatever degree of compaction has accompanied the penetration of the frost downwards, comes to the pipe level. At that point if there had been uniformly compacted ground surrounding the underside as well as the top side and the two vertical spaces beside the pipe, there would be a slightly greater compaction of the material just below the frost crust, and the amount of movement of the material at the sides and bottom of the pipe would be of the same kind of minuteness that I say accompanies this expansive action of the ground immediately below the frost crust. Unless the compacted material—when we consider the compacted material containing the kind of moisture content that might be expected in this location with such material, I cannot conceive that there would be any marked squelching or squeezing to the top of that less compacted material from below and the sides. 30 40

Q. Would that be true of that material as you saw it in June when the pipe was lifted? A. Yes, certainly, and the content at that time was of the order of sixteen per cent. in June. I have not paid a great deal of

regard to the suggested moisture content of this soil over there for this reason, I know that there was a tremendous quantity of water in that lane following the fire. That was quite apparent from the quantity of ice I saw there the first or second day following the fire and there was water running down that pavement on some of those early visits to the site. Such an amount of water is away beyond any ordinary rainfall and the seepage of some of that water into the body of ground underneath that pavement at the lane and at 107th Street crossing almost certainly, and in my opinion quite certainly, has some effect on the moisture content of
 10 that ground in this trench under the fracture in June—four months after the fire.

Q. Even so, would you regard the material you saw as the kind which would move and squelch? A. No, I walked through that trench and around it and saw the condition of the ground there and it would not be the kind I would describe as squelching material, the sort that would ooze up around your boot soles when you tread on it.

Q. Now, so far as that soil is concerned, was a test of that soil made at the University to determine its constituents? A. We had a test made and found it to contain seventy per cent. sand, which consists of all
 20 particles, one-twentieth of a millimetre in diameter and upwards.

Q. The balance being what? A. The balance being clay and silt.

Q. And would you agree with those who have given evidence for the plaintiff, granted this soil had a proper amount of moisture it would make good compacting filling material? A. Yes.

Q. Well just go on. A. I think I finished—

Q. The matters with respect to soil? A. Yes.

Q. Now I want to ask you this question. In your investigation did you consider every possible method of bending of that pipe that you could think of? A. We certainly did.

30 Q. And your conclusion is that it broke by bending? A. Yes.

Q. The other stresses that you have spoken of as compared with the total strength of the pipe are not large? A. Apparently not; five thousand pounds and that kind of thing.

Q. As against— A. As against twenty-nine thousand pounds of pipe metal strength, we have used twenty thousand pounds in our calculations.

Q. So that some other stress must have intervened, in your judgment, to break that— A. Undoubtedly, a bending stress.

Q. And I want to ask you this question, that aside from the bending of the pipe due to the subsidence of the earth beneath it, the shrinkage
 40 of the earth beneath it—the loosening in support of the earth beneath it is perhaps a better way to put it—over and in the neighborhood of this weir chamber construction in 1931, can you think of any other reasonable degree, according to your science, which could have broken that pipe?
 A. That was our end conclusion—that subsidence broke the pipe.

Q. For the reasons you have advanced here? A. Yes.

*In the
 Supreme
 Court of
 Alberta*

Defendant's
 Evidence

No. 56

Robert
 Starr Leigh
 Wilson,
 Examination.

continued.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 56
Robert
Starr Leigh
Wilson,
Examina-
tion.
continued.

Q. And you have canvassed over every possibility that did occur to you? A. Everything we could think of.

Q. Now the theory of subsidence you have given by undermining, is that something which is well known to engineering? A. Oh yes.

Q. And I want to ask you this question, if in your judgment as an engineer, it was good practice to build in 1931 this overflow sewer construction, of which we have heard, in the way which we have heard, without supporting the gas company's line? A. A support from a purely engineering point of view and only the technical aspects of the problem— as I do not want to question the propriety of decisions made by brother engineers—there is no question in my mind at all but that a substitute support should have been furnished for these gas mains incidental to the construction of the weir chamber and tile sewer. 10

Cross-Ex-
amination

CROSS-EXAMINATION BY MR. WOODS.

Q. You came to the conclusion of which you have given evidence, not by seeing any subsidence of the weir chamber or over the tile sewer—not by seeing it? A. I heard the evidence.

Q. I am speaking of you? A. I did not see the holes down below there.

Q. You did not see any subsidence? A. No. 20

Q. And the conclusion that you have given evidence about comes about by the method that you employed, by taking the various stresses to which that pipe was subjected and making computations such as you have given evidence about, adding them together and finding that they are less than the amount of stress required to break the pipe at the weld and therefore conclude that it must have been subsidence. A. Yes. The bending in the pipe of course was apparent in addition to the items you have named.

Q. But that is the way you have come to the conclusion to give this evidence? A. Yes. 30

Q. Now I want you, if you will—among the various computations you have made, I wonder if you have made this computation? You see the line, the yellow line there which is the horizontal line where the twelve inch main was, and it was laid down on a commercially straight line? A. Is it the bottom yellow line you are pointing to?

Q. The horizontal position of the twelve inch pipe.

MR. HADDOW: There is no horizontal position shown. The position found on June 18th is shown by the filled yellow line on this Exhibit 28.

MR. WOODS: But where is the straight line from one Dresser coupling to the other shown? 40

MR. HADDOW: A straight line would have to be drawn between the two Dresser couplings and the middle ordinate, as I remember it, being in the neighborhood of about six inches.

THE WITNESS: Yes, that is my recollection.

Q. MR. WOODS: Among all the computations that you have made did you make a computation to show how much soil there was between the pipe assumedly when it was put down, assuming it to be straight from one Dresser coupling to the other and the place where it was found?

A. Only in this way, that depending on where you take the ends of the span under consideration only when you take two arbitrary elevations at the ends of an assumed span length can you arrive at the amount of soil there may or may not have been directly under the middle of that span and on the basis of the seventy-seven-foot span the computation arrives at nominally six inches.

Q. With six and one-half inches of soil? A. Yes.

Q. And then going down, as you have pointed out, in a "V" shape from the Dresser coupling? A. Yes.

Q. Now can you give me an estimate of how much soil there was in that triangle. You see what I mean? A. Yes, six inches, taking half of six inches, multiply by seventy-seven feet; that is one-quarter of a foot; let us call that eighty feet.

Q. Yes. A. That, to be multiplied by the width. You can assume anything you like up to a maximum of the diameter of the pipe. Twenty foot times the diameter of the pipe would give you twenty cubic feet.

Q. Twenty cubic feet in that triangle? A. I think so. Eighty foot times a quarter times one, yes, twenty cubic feet, there is no doubt of it.

Q. We have made a computation—well it is not far from yours—that there would be about three cubic yards? A. Twenty cubic feet is less than one cubic yard.

Q. Well let us get that computation. A. You have probably taken the trench about three feet wide and that is too much.

Q. I am proceeding upon the basis that Mr. Smith has driven home so constantly that the ten-inch main as well as the twelve-inch main has gone down some? A. Yes, that is apparent.

Q. And I am taking the trench about four feet wide and I am taking eighty feet and I am taking the average. Four times our computation would give us eighty cubic feet, almost three cubic yards, on that basis.

A. I think it is an unnecessary computation. It arrives at a very large amount for the reason that our assumed span length is seventy-seven feet here.

Q. Well eighty? A. Well eighty feet if you like. And the suggestion that I leave in your mind with regard to the length of pipe affected by subsidence caused by the tunnelling below would be, I suggest, decidedly less than eighty feet.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56
Robert
Starr Leigh
Wilson,
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56
Robert
Starr Leigh
Wilson,
Cross-Ex-
amination
continued.

Q. I know you do, but what I am getting at is this that we have clearly a drop down in a "V" shape, as you have described it, from the Dresser coupling to a certain point six and one-half inches deep. And I am assuming that trench to be four feet wide and I am assuming it to be an average taking it from one end to the other of three inches deep. And that would bring you to something like three cubic yards of earth. A. Yes, that computation gives you three cubic yards.

Q. Well deeming that to be right for the purpose of my question. Where did that three cubic yards of earth go? A. Part of it would be within the shrinkage of this volume of ground affected by the tunnelling operation. 10

Q. How much of it? A. Let us get the three contributors to the thing first, if I may suggest that.

Q. All right. A. I stated early that I did not attempt to estimate the amount due to shrinkage alone as apart from shrinkage and trickling penetration and silt carrying water.

Q. Can you tell me where the three cubic yards of dirt—that is cart loads of soil? A. Yes, three one yard cart loads.

Q. Well tell me where any such amount of soil as that went; if there was that amount of soil there and you have the pipe down in the position it is on the 18th of June there is no doubt that soil has gone some place. Where is it? A. Some of it would shrink into itself as part of the body to which it belongs. Some would be carried away by a seepage of water through crevices and cracks and into cavities. 20

Q. Go on. A. That is the lot.

Q. That is all you can suggest? A. Yes, seepage, shrinkage and percolation.

Q. You suggest that three cubic yards of dirt could be eliminated in that way? A. If the computation of three cubic yards is an appropriate one. 30

Q. Could be eliminated, could vanish by being pressed into the under surface or carried away in silt in the water? A. On the assumption of the three cubic yards.

Q. You really think so, do you? A. Oh there is no question about it if it was there at the start and is not there at the finish.

Q. And would any such amount of soil if it were pressed down into the under soil, would it not show a settlement of the surface of the soil above that fifteen-inch tile sewer? Take my computation of three cubic yards. A. The soil above the fifteen-inch sewer consisted originally after construction of backfill. It is probably more compact to date than it was the day it was put in except for crevices between the soil and the pipe surface, or percolating channels along the corner of the trench bottom and such places. Whatever shrinkage took place in that backfill might be replaced to some extent by the percolating silt coming in and percolating water or road material being carried down through the crev- 40

ices and the cavities between the weir chamber and the pipe above.

Q. Assume for the purposes of my question that there is no visible subsidence of the ground above the weir chamber at all—no visible subsidence—that it is as the witnesses Mr. Haddow, Mr. Ruff and Professor Morrison described when they examined it; it is not settled at all. Now assuming that evidence is true? A. Yes.

Q. Is it possible or credible to assume or to suppose that there have been three cart loads of dirt pressed into that soil between the mains and the top of the weir chamber? A. I do not know how much up to the
10 three yards might have gone down there. I have not attempted any computation of that. Any computation I did attempt would be considerably less than three yards according to information available on the surfaces here.

Q. Well assuming. We have taken the three yards computation for the purposes of my question. What I am frankly asking you is whether it is conceivable that you can press three cubic yards of earth down in that distance without the soil above the weir chamber settling? A. I do not think that volume would be down there—no. I would not think there would be three yards down there.

Q. But if it is then the soil above the weir chamber would have
20 settled? A. Oh not necessarily.

Q. Well take it either way you like. Do you say that if you had three cubic yards of earth pressed down there that the condition of the soil between the weir chamber and the gas pipes would be found as these witnesses found it? A. If three yards had been pressed down there?

Q. Yes. A. I think likely there would have been more cavitation evidences than as appeared unless there is some extraordinary condition of percolation beyond anything in my opinion.

Q. Well it is not at all likely then that the soil above the weir chamber would be found in the condition that the witnesses found it if in
30 fact there were any such volume of earth pressed down—depressed or subsided below the gas pipes. That is right? A. I do not think things would have been as they have been described if the three yards had been pressed down.

Q. Isn't it then more reasonable, always assuming that my three yard computation is approximately correct, to explain the condition that we have found by the explanation that there was not that soil — that amount of soil—or anything like that amount of soil in that area at all? A. What area?

Q. The area four feet by eighty by an average of three inches. There
40 was not anything like three cubic yards of dirt in that area underneath the pipes. Is not that more reasonable? A. You just gave some figures of eighty feet by four feet by one-quarter of a foot and it still makes three yards, in round figures. I do not think I understand your question.

Q. I am suggesting to you that the explanation of the fact that we

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56
Robert
Starr Leigh
Wilson,
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 56
Robert
Starr Leigh
Wilson,
Cross-Ex-
amination
continued.

find things as we do, is that in point of fact there was not the soil under there—that the pipe was not resting on solid backfill or anything like solid backfill and that the backfill as a matter of fact was meagre and skimpy and there was not anything like three yards of dirt there? A. The computation you asked me to make, you providing the factors, would not be made in quite that fashion if I were free to make it.

Q. I beg your pardon? A. The computation which arrived at the three yards would arrive at a quantity which is somewhat less, for this reason—

Q. Well I am asking you to assume that my computation is rough- 10
ly correct? A. Alright.

Q. And I understand you to tell me that if it was and it brings the amount of earth down at three yards and if that is so, then if there were anything like that amount of soil underneath those two pipe lines we certainly would not find the condition that these men found down opposite the weir chamber with the soil absolutely undisturbed. A. The evidence did not say that the soil was absolutely undisturbed. That is not a reasonable conclusion from what we have heard.

Q. What did you hear, then? A. I heard there appeared to be a 20
roof surface.

Q. And what did you hear?

MR. SMITH: I suggest the witness be allowed to finish his answer.

MR. WOODS: What do you say? A. I said the portion of the cavity roof insofar as it has been described in my hearing or from what I have read in the transcript did not suggest whether or not there might have been some roof movement before the cavitation takes place.

Q. Now will my friend correct me if I am wrong or His Lordship correct me if I am wrong, or anybody in the court room; that the evidence of Mr. Haddow, Mr. Ruff and Professor Morrison was distinct that there was no sign of settlement of that earth at all. Now didn't you read that or 30
hear it? A. I may have heard that but I also have in mind the evidence of finding material there which arrived from some place or was placed there following the construction of the tile sewer and weir chamber. Somebody, in some of the evidence, somebody took a block out of the manhole, I think it was, and found earth there which had to be removed a little bit in order to see the roof of the tunnel. I may be wrong in my recollection, of course.

Q. They took a piece out of the side of the weir chamber and they examined the earth that was above that weir chamber and each one has said that there was no sign whatever of that earth having settled. Now 40
if that is what the evidence is, alright. Now can you account for—

MR. SMITH: There is a good deal more evidence with respect to that area.

MR. WOODS: I am giving the gist of the evidence of the three men who went there to examine that very thing.

MR. SMITH: Then why not give the rest of it.

MR. WOODS: Assume that that condition is so at all events. Can you account for that condition consistently with there being anything like three cubic yards of dirt underneath those pipes? A. I think it would have been less than three cubic yards that went through there by percolation.

Q. How much less? Very much less? A. Well I would not say.

10 Q. Would you go so far as to say three cubic yards? A. Well I like quantitative terms whenever possible.

Q. Now if the soil of the backfilling of that fifteen-inch sewer or tile drain settled and let the soil up above, down, would there not be evidence of that soil displacement? A. There might be if it involves cavitation. If it does not, I suggest you could not determine evidence of the subsidence of a roof tunnel unless the integrity of that roof is fractured itself—is disturbed.

20 Q. If what you suggest has happened and the soil above that fifteen inch tile sewer has settled down letting down the upper surface and not so much as it let down the upper surface before it lets down the surface the gas mains rest on—if that condition remained you are not serious when you say if you went down there to be able to see evidence of it— A. You might and you might not. I cannot suggest it until someone saw it.

Q. Was it you who objected to the opening up of this?

MR. SMITH: Now the other day I wrote my friend a letter, without prejudice, and if he wants to consider this sort of thing—

30 MR. WOODS: I have not any letter at all. I am not referring to any letter about this. My friend read in court a letter which he got signed by Dr. Wilson and Cameron.

MR. SMITH: I am speaking of a letter written to you about conversations taking place between engineers.

MR. WOODS: I am not referring to conversations between engineers. I am referring to the fact that this appeared in court in a letter written by you to my friends that you objected to the opening up of the ground around that tile sewer so as to show the condition of affairs underneath it. Now I am right about that. You did object to it, didn't you?

40 A. I gave certain advice to my clients which is embodied in a letter which they have.

THE COURT: Was that letter written without prejudice?

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56

Robert
Starr Leigh
Wilson,
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56

Robert
Starr Leigh
Wilson,
Cross-Ex-
amination
continued.

MR. SMITH: No, my Lord. I read it. I do not mind any examination about the advice that Dean Wilson gave me. I am speaking of a former conversation between engineers.

MR. WOODS: The point about the thing is that I gathered that you objected to the opening of that district? A. I did not use the word "object." I am quite certain on that. My letter surely could be made available.

MR. WOODS: I understood you to say in that letter—I have not been furnished with a copy of it, I expected to get a copy of it, but I have not got one—I understood that you did not want this to happen because it would cause a destruction of the evidence. Do you remember that? A. Let me amplify it a bit including that. The situation that developed after adjournment on Friday and that continued into Saturday noon was something like this insofar as my own re-action to it all was. I heard a proposal on Friday evening or very late afternoon to open the street in order to make further underground investigations. I assumed, and was correct in that assumption, as it turned out on Saturday, that this was to be an investigation to be completed and in time for Court on Monday morning. I took this position then, and I would always do the same way, all my thinking about this whole episode has been very careful and there has been ample time to do it in. I did not think at the moment that I was free to enter a discussion wherein I might be expected to disclose what in my opinion was my client's property—I mean the contents of our joint report. I found myself embarrassed on Saturday in conference with colleagues and friends as well as my direct associates in this investigation by being asked, quite innocently I am sure, to suggest the kind of thing that should be looked for in carrying out a further underground investigation. I did not feel free to offer detailed suggestions as to how such an investigation should be carried on particularly in a thirty-six hour period without having time to consider all the possibilities I could think of underground. And in consequence of this I think the other parties to the little conference perhaps thought I was taking an absurd position in some respects but it was really due, as I say, to the handicap of not being able to disclose completely the thought involved in our report.

Q. But you see you have lost sight of my question? A. I am sorry if I have.

Q. My question was that you suggested or stated what you meant. I want to get it for my own reasons and the reasons of the Court, that if we opened that thing out and showed the position on the ground the evidence would be destroyed? A. The answer to that is short and concise. Any suggested method that was described to me on Saturday included the use of the tool such as a pick, to go picking at the face of a new exposed ground under there as well as the old tunnel opening

quite some way beyond it—and the thought in my mind at once was “well if there are very fine earth cracks this is a sure way to conceal them.” Now I do not think for a moment that the suggestion when put to me, the suggestion of using a pick—I had that in mind. I do not suggest that for a moment.

Q. If you were to go with a pick or shovel or anything else and open that tunnel up as you came to every particular place where there was a crack or cavity or anything else that was observable and saw evidence at all of any settlement, would it be marked on your diagram?

10 A. If one saw them and if one used methods which would preserve it so that one could see them before they were destroyed. A pick gets to a place before your vision does and if a pick goes over a crack in the soil I think that pick is very likely to destroy that crack and prevent you seeing it. That was one of my theories.

Q. THE COURT: And do you say that such cracks if present would make a material difference to the conclusion which the engineers would arrive at? A. If cracks are there it would absolutely confirm everything I have said in the way of subsidence.

20 Q. And the pick might destroy the visibility of the crack or really the crack itself? A. Yes.

Q. MR. WOODS: Even while you were there looking on? A. I was not assuming I would be using the pick. And the pick gets there before the eye.

Q. If we had that opened out you could tell whether there were any cracks or not? A. No suggestion has been given to me yet of a method whereby cracks could be observed.

30 Q. And in a general way surely the evidence of whether there were cracks or not or cavities is now down in the soil at the corner of 107th Street and the lane. That is where it is? A. Some of it, I would think perhaps.

Q. And unless we open that up we won't be able to tell whether there were any cracks or cavities or not? A. My situation for the week-end was, shortly, this, that I won't do things in a hurry—I am repeating the attitude of mind I was in at the time—I won't be hurried into ventures here when I have no definite idea of how any evidence that may exist down there can be preserved by some scheme of workmanship in re-opening that ground.

40 Q. Have you ever done any opening up of ground very much yourself? Have you had much experience at it? A. I have been on excavations the size of the Welland Canal and large buildings and railway excavations galore.

Q. I am told that there is no suggestion that even an air crack could not be detected as you went along. Do you suggest that is not so? A. I never before had the suggestion given to me of going into an

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56
Robert
Starr Leigh
Wilson.
Cross-Ex-
amination
continued.

exhaustive hunt for air cracks in the soil and I have never thought of such a project and in consequence I would not give an opinion on it.

Q. Does your evidence and the statement you made to the court suggest that there has been settlement above that fifteen inch tile drain? Does that necessarily mean that there would be cracks? A. Oh no, not absolutely necessarily.

Q. Does it necessarily mean there would be cavities? A. We know of cavities all right.

Q. Does it necessarily mean that there would be cavities? A. You would have to find an outlet. Yes, there would have to be cavities or 10 traces of previous cavities, perhaps presently filled.

Q. And the traces of these cavities or the cavities themselves would be discovered by opening up the ground? A. Well the sort of cavity that might occur in the backfill material in that tunnel directly adjacent to the tile, if such cavities were filled up they would be indistinguishable, perhaps, I am not too certain, in a hurry, but I rather think they would not be distinguishable from the backfill material. That is rather a snap decision just given here on the spur of the moment.

Q. But on consideration you would admit that any cavities that were present would certainly be discovered? A. Any large cavities 20 that were still present would certainly be discovered.

Q. What do you mean by large? A. Well not as big as one's head.

Q. Or as big as one's fist? A. I am not so sure of that—no.

Q. Now you mention that there were cavities discovered, that there was evidence of cavities given in evidence here. To what do you refer? A. I am referring to the cavities discovered in the vicinity of the weir chamber.

Q. Now my memory of the evidence, and I think it is fairly clear, is that the two cavities mentioned were one cavity about the size of Exhibit 17 above the weir chamber or to one side, and the only other 30 cavity—

MR. SMITH: In front of the weir chamber and over the tile.

Q. MR. WOODS: And the only other cavity of which any evidence was given was a cavity in the backfill between this piece of scantling that holds up the ten inch main and the manhole "A" constructed in 1907. Now these are the only two I heard any evidence of. Did you hear of any others? A. I am not too sure on this. I think there were two cavities described in my hearing here in court; the one you named last between the old sheeting and the manhole "A" and the second one which was seen when looking forward through the hole in the front end of the weir chamber directly above the fifteen inch tile. I think that was the 40 one that was described.

Q. As big as Exhibit 17? A. Yes.

Q. So that we are at one on that?

MR. SMITH: The evidence is—it was described in two ways—twelve by twelve by two by Mr. Haddow and lying on a flat plane. It was described as roughly of the same order of size by Professor Morrison or some other witness and lying on a vertical.

THE COURT: I see Professor Morrison does not agree with your statement.

MR. SMITH: He shook his head.

THE COURT: Approximately, as I understood the evidence it was as you stated. Now I would like to know what the difference is.

10 MR. SMITH: I am told I reversed it. Nevertheless the situation exists there between these two witnesses as I remember it.

THE COURT: Is not that right?

MR. WOODS: What is that?

THE COURT: As to the manner in which that book, if it were the cavity, would be lying.

MR. WOODS: What is your Lordship's understanding?

THE COURT: As I understood it, Mr. Haddow took it as if it were lying flat and the other one was that way (indicating).

Q. It is a big difference in observation.

20 MR. WOODS: It is a big difference in observation. But we will have Mr. Haddow in to say what—I may say that our evidence or Mr. Morrison's evidence is that it was flat and we think and I think Mr. Haddow now agrees that he either misunderstood my friend or answered him too hastily when he said it was vertical. What I want to do is to get at these cavities.

MR. SMITH: My friend says I misunderstood him. Mr. Haddow himself called attention in the witness box to that without my asking him a single thing.

30 Q. MR. WOODS: Now let us get rid of this cavity nearest to the manhole "A" and let us get our minds off that. It is perfectly clear that that cavity in the backfill there between that scantling two by four— A. Yes, something of the sort.

Q. That it was a cavity made in the 1907 construction by the dropping down of the backfill? A. Are you telling me the evidence?

Q. That is what you take it to be from the evidence you heard? A. No, decidedly not, no.

Q. Now do I understand you to suggest this, that that cavity nearest to the manhole "A" and between that low pressure main and the manhole between that scantling and the manhole is a cavity that was

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56
Robert
Starr Leigh
Wilson.
Cross-Ex-
amination
continued.

made by the subsidence of the ground after 1923? A. I am suggesting that it is a cavity. I think this is most obvious, that it is obviously due to the disturbance of this sheeting incidental to the drive of the tunnel. I am assuming it went down initially the same depth and that it was broken away in order to make way for the tunnel entrance to the man-hole.

Q. And that disturbance of the sheeting—and it dropped down?

A. Yes, I would think so.

Q. And there is that one and this other one as big as Exhibit 17.

A. I did not hear all the evidence and the little controversy here as to which way this cavity is above the fifteen inch tile sewer is a little unsettled in my mind. I did specifically hear of the thing illustrated by the book lying flat. 10

Q. At all events there are only two? A. That is all I have heard so far.

Q. Now do you suggest seriously that those two cavities absorbed, took up or are responsible for the—or are caused by the sinking of the earth underneath the gas mains? A. The question is upside down.

Q. Then put it right side up? A. The cavities are there independent of the gas main. 20

Q. Well do you connect these cavities in any way with your evidence? A. Yes.

Q. Well how do you connect them? A. Cavities appearing at the bottom of a volume of ground suggest subsidence very very strongly to me.

Q. And the only two evidences at all that you have in the way of cavities, of any subsidence in that ground up above the subsidence—as a matter of fact you speak of roughly an eighty foot span—are those two cavities, that is right? A. The subsidence is indicated at the centre of the eighty foot span and petering off to some distance each way from the broken main. 30

Q. You would have to have a petering off quite a distance? A. One can only arrive at the amount of that by a very indirect way and my argument this morning with regard to the likely form of the area affected by subsidence caused by cavities and percolation and seepage opportunities provided below, has suggested to me in the light of computations of something of the order of twenty-five or thirty to forty feet.

Q. Would you put it down below twenty-five? A. I would not argue very strongly if someone said less. 40

Q. You would not argue very strongly if I put it down to fifteen? A. Oh, absolutely. I cannot conceive of the bend going in there. What we did was to take a series of pipes and assumed span lengths with deflections which fitted in with the condition we found after the fracture, and the known properties of the soils.

Q. If soil shrinks above a cavity it fills in the cavity, doesn't it? A. Sometimes.

Q. Is not that what you would expect? A. I have seen excavations where a tunnel would be made in a little way and some considerable time might elapse, months, possibly, before there was a complete cavitation which to all intents and purposes interferes with freedom of access to that tunnel again.

Q. Now surely if you have a hole as big as Exhibit 17 in the ground in the neighborhood of the weir chamber and there is a sinking of the ground above that, that hole is going to be filled in? A. If the ground sinks far enough—only then.

Q. But if the roof of that hole is solid and undisturbed then there has not been any sinking in? A. That does not follow. I know when you say undisturbed you mean undisturbed in appearance and not by measurement. Disturbance might be determined by measurement if one know the original measurement.

Q. Take it on the vertical. Where is that hole above the weir chamber as compared with the break? How far one side or the other? Is it below it? A. It is shown beautifully on the model there.

Q. Well let us have it. A. I think the black mark indicates the weld. The mark "W" indicates the weld and the described cavity over the fifteen inch pipe line, I would say within two feet horizontally of the weld.

Q. Two feet which way, west or east? A. The description of the cavity over the fifteen inch pipe would place it about at the point of my pencil and that seems to be within a foot or two horizontally of the weld. So that the weld is certainly almost at the centre of the area that might be affected by the cavity.

Q. And if the earth fell in at the weld and down into that cavity or settled down because of that cavity would you not expect that pipe to bridge that distance, to stand undisturbed over two or three feet of ground? A. No, for the reason that the action of a cavity below here is almost certainly extending out beyond the vertical towards the horizontal.

Q. I know you have said that. But we have had evidence here of the fact that in this ground, in this clay soil that is underneath that, that very often the rule, as I regard it, is that the soils are undisturbed? A. I cannot agree with such evidence.

Q. You put your hand in a fan shaped way and as I have gathered you say that it might slump out from that distance so that it would go above an angle of about forty-five degrees? A. It is suggested by a forty-five degree angle.

Q. Do you suggest that is the angle? A. Yes.

Q. Why? A. Because that is the usual angle that is seen and is used.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56

Robert
Starr Leigh
Wilson,
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56
Robert
Starr Leigh
Wilson,
Cross-Ex-
amination
continued.

Q. Where did you ever see any angle in this kind of soil forty-five degrees from the original plan? A. I cannot think of an instance here, but soils generally, I have seen plenty of soil in disturbed areas.

Q. It is from this figure of forty-five degrees that you have arrived at the figures twenty-five feet, thirty feet, thirty-five feet or forty feet, isn't it? A. Something of that sort.

Q. Now give me the basis of opinion and evidence—give the court the grounds upon which you say that this hole down there as big as Exhibit 17 would cause the earth above it to settle at an angle of forty-five degrees? A. It is this hole together with the fact of a tunnel hav- 10
ing been driven under there, which, combined, affect a volume that certainly runs out at some angle. I won't name forty-five degrees and stand pat at forty-five degrees. Neither will I name vertical. I know vertical is wrong and that horizontal is wrong and that somewhere between is right.

Q. It is somewhere between the actual vertical of that hole and the horizontal? A. Yes.

Q. And you cannot give any closer computation than that? A. My best opinion is an estimate of forty-five degrees.

Q. Why do you estimate it at that? A. Because it is the custom- 20
ary thing.

Q. Whose custom? A. Every engineer's custom—well a great many engineers.

Q. We have had evidence from Mr. Haddow who is certainly a great deal in this soil and Professor Morrison has seen soils and he mentioned the C.P.R. grade where it is not settled at all. Why do you say there has necessarily got to be a widening out of any such cut to the extent of any particular amount of degrees? A. Because I have seen numerous examples incidental to railway cuttings where we work on this assumption, which proves it is in practice, that you can make a 30
first cut at a slope of the order of one and a half to one. For a long time for a cut to maintain that slope it seems to be one and a half to one and it is remarkable how close that one and a half to one stays there for permanently exposed slopes. Now that being interpreted into this sort of situation leads me to conclude that some angle of about forty-five degrees, maybe a little more, maybe as much as one and a half to one, is most certainly a thing that is affected by any disturbance under ground.

Q. What do you say about the C.P.R. cut on the south side which has been nearly vertical for twenty years? A. I have seen scores of 40
such places. And the answer simply is this that there you have a soil which gets a great deal of breeze and sunshine and is cut at the top of a hill. We are on a summit about there and there is a drying out action which carries the moisture content below anything that anyone has in mind about this street intersection, and the clay drying out there passes

to a condition of lack of moisture or a condition of dryness beyond anything that is involved in this shrinkage idea here and latterly becomes what we call bone dry. I suppose on analysis it might reveal two or three per cent. moisture content in that bone dry exposure. That bone dry condition determines a new structural property in the body of the clay as compared with clay containing moisture within the range of ten to twenty per cent. The occasional interference with that cliff by storms and that sort of thing and getting wet occasionally will not restore a usual moisture content because the bone dry condition presents a, practically speaking, impervious material through which the moisture won't seep in. It is simply a case of allowing air and sun exposure there, allowing a clay cliff to develop to a practically vertical situation.

Q. Would you give the same explanation of all those cuts along the G.T.P. between here and Winnipeg? A. Yes, if such occurs.

Q. They are called McHenry's cuts because it was he who made them? A. Yes, I knew him.

Q. You know the cuts of the G.T.P. between here and Winnipeg. You know the cuts are vertical, don't you?

20 MR. SMITH: I think the witness should be allowed to answer the question.

MR. WOODS: I do not think I have interfered with him.

MR. SMITH: I do suggest that the witness was in the middle of an answer and he was interrupted, and I ask that he may be allowed to answer.

THE COURT: You may do it if you think it necessary later.

A. I have seen cliffs vertical as in the face of this C.P.R. cut and I have seen lots of them. I would not suggest how many.

Q. I was asking you particularly about the cuts on the G.T.P. A. I do not know about any particular cuts on the G.T.P.

Q. If I am right in saying that the cuts Mr. McHenry instituted on the G.T.P. were vertical cuts and they are there today just as on the day he made them, the explanation is of the same character as that you have given about the C.P.R. cuts. A. Being bone dry, or some different composition of clay.

Q. I suggest to you that when you came to this forty-five degree idea of yours that what you really had in mind was that ordinarily a railway embankment runs at one and a half to one and that is where it settles and you thought "Oh well I will take the one and a half to one 40 grade." Is that right? A. Oh no. The forty-five degree angle is quite a usual assumption for such things and it is based on practical experience.

Q. You have not had any particular experience with Edmonton soils, have you? A. I cannot say that I have, offhand.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56

Robert
Starr Leigh
Wilson,
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56
Robert
Starr Leigh
Wilson.
Cross-Ex-
amination
continued.

Q. And this suggestion about this particular soil under 107th Street, that it would fall away to that extent, from the vertical—it comes to you by reason of some experience you have had on railroad work elsewhere? A. In somewhat similar—

Q. What—similar soils? A. Sandy clay.

Q. Where? A. Numerous places. In many railway cuttings.

Q. Well give me some. A. On the Toronto Sudbury branch of the C.P.R., on the Temiskaming, Northern Ontario, on the C.P.R. main line down near Sherbrooke.

Q. Do I understand you to say that the soils at those three places are 10 the same as the soil south of Jasper there? A. Well not exactly similar. I do not think I ever saw a measurement taken of those soils down there. But in general insofar as visual inspection will determine, and it is quite a few years ago, they are what we call sandy clay soils.

Q. I do not suppose you will dare to suggest that you have an acquaintanceship with the soils here comparable to Mr. Haddow? A. Oh dear, no.

Q. Now I will go to another point. As I understand, when the early frost comes and the frost crystals are formed or are in the process of being formed underneath the pavements in Edmonton it is not un- 20 common for us to find that the expansion of the earth as a result of the formation of those frost crystals pushes the pavements up? A. My observation of that is that heaving of pavements that I have noticed in Edmonton insofar as I can recall, and in particular I do recall the one of 1919-20, that was my first winter in Edmonton—that occurred as I recall it incidental to some thaws.

Q. Well do I understand your answer to me to be that you do not agree that there is pavement heaving in Edmonton as the result of the expansion of the frost particles in the course of their formation in the early winter? A. I will agree that you will get occasional pavement 30 heaving here where you have appropriate moisture and frost conditions.

Q. And where you have for instance—I have a garage attached to my house that is not a very expensive garage because I could not afford one, but it is a wooden building right at the back of my house and some blocks down in the earth and each winter the settlement down of that thing affects the doors of the garage. Have you got that? A. The settlement down.

Q. Yes, it settles down. A. I have not noticed that. My asphalt walk came up a bit.

Q. Well we are together on this, that there is a certain amount of 40 pavement heaving in Edmonton as a result of the action of the frost particles in the early winter? A. I won't agree to early winter. My recollection of the 1919-20 winter is that it occurred late in the winter.

Q. You said that before and I thought we had got over it and you agreed with me that there was a heaving in the nature of what we described?

MR. SMITH: No, he did not say that, and you added the other.

A. My only clear recollection of pavement heaving here, and there have doubtless been others I have not observed and have not definite recollections of having been incidental to appropriate frost and moisture conditions.

Q. MR. WOODS: Then I come back to my original question. I am instructed that there is an action in the early winter when the frost crystals are forming? A. It might occur occasionally but not generally. There is no general upheaving of the pavements.

10 Q. Then we have got that far, that it might occur occasionally? A. Yes.

Q. And it has not anything to do with this business of moisture conditions. So we do not want to go back to that? A. It must be accompanied with moisture.

Q. Yes. You cannot have frost particles or ice particles without moisture. But you have your early winter conditions, your moisture coming out? A. In the thaw.

Q. And the frost crystals forming and setting up an expanding action that does have some effect on the heaving of pavement, occasionally, in Edmonton? A. Occasionally, I would agree that such a thing might happen.

Q. And would you also agree with me that where in any particular case where the pavement, we will say, is solid pavement and the resistance is very great to that kind of frost action that the action set up by these expanding frost crystals is going to go downward? A. Only to the extent that the weight of your pavement will force it down and the weight on an inch of pavement is equivalent in round figures to the weight of twelve inches of ground.

30 Q. You know a great deal more about this than I do. But am I right in saying that that force that is so set up will follow the path of least resistance? A. It depends. Forces generally when released follow the path of least resistance.

Q. Is this kind of force an exception to the general rule? A. Oh no.

Q. Then answer my question, that force when set up will follow the path of least resistance? A. Yes.

Q. Now I am asking you to assume that the path of least resistance at the corner of 107th Street and the lane south of Jasper was downward. I am asking you to assume that for the purposes of my question. A. Alright.

40 Q. Would not that condition each year force that pipe a little bit further into the ground? A. No, because the frost cannot go down unless you remove support from beneath it. It cannot press down unless there is an absolute lack of support—unless there is a lesser support. And you have this frost crust extending into the adjacent ground.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56
Robert
Starr Leigh
Wilson.
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56

Robert
Starr Leigh
Wilson,
Cross-Ex-
amination
continued.

Q. But you know quite well, or I think you do, that what I am asking you about is what Professor Morrison described in his opinion had happened at this place and as he described it the pipe goes down in that way gradually each year at the beginning of the winter but of course when the frost line gets down below the pipe so as to give a solid foundation then the action stops for that year, and I am speaking of the time before the frost action has hardened the ground beneath the pipe?

A. I agree as to the quality of action described in the other evidence but differ in the quantitative aspect of it. I just cannot conceive of the half inch, one inch affair. 10

Q. And we cannot conceive either of your information of this business of the sewer having anything to do with it so we are even in that respect. Now there was described here in evidence by one of the witnesses a condition when that pipe was taken up. There was a pressure ridge found. You know what a pressure ridge is. It is something like this. That is the ground before loading, and then there is a load. We will say this is the pipe and there is a lateral flow up that way when it is loaded and then the load is removed and the pipe is taken up on the 18th of June and there was a pressure ridge found at the very place where this pipe was. Now is that pressure ridge possible in relation to a lateral flow of the material surrounding that pipe in the way shown in this little illustration? A. If it was a pressure ridge. But I could not help but think in hearing that after the lifting operation that took place after taking the broken pipe out of the ground and the extreme care that would have had to be used in order to avoid that side swing of that pipe. And one might then get the impression which has been described as a pressure ridge. 20

Q. I think you can, though perhaps these gentlemen who were there observing this thing in very very minute detail, these engineers, would mistake the accidental mark that somebody made in getting the pipe up for a pressure ridge. Is that what I understand? 30

MR. SMITH: That is not the evidence, my Lord. The pressure ridge was mentioned by one witness and one only, in my recollection, and that is Mr. Haddow. He described it as an ear and then later he used "pressure ridge."

MR. WOODS: Well is not that pretty good evidence?

MR. SMITH: Yes, but I am correcting you. It is good evidence of course but I prefer Mr. Haddow's evidence to yours.

MR. WOODS: In deference to my friend, let us see what Mr. Haddow, who was particularly concerned about the matter and attended there at that time and carefully observed the taking up of the pipe, states—that he saw there in the soil underneath the pipe what he has 40

described as a pressure ridge. Now is your suggestion that Mr. Had-
dow at some time mistook some other sign made by someone casually
in the course of lifting this pipe? A. The slight lateral movement of
the pipe at the moment of lifting it from the ground might have
created the thing described as a pressure ridge.

Q. You are of course acquainted with this publication? A. I am
sorry I am not. I have not seen the name of it yet. "Public Roads. A
Journal of Highway Research." Yes, it comes to my department.

Q. I presume it did because it has the name of your department on
10 it. Now we are talking of the up-lift of surface due to soil conditions.
There is a paragraph contains this: "In experiments performed—"

MR. SMITH: May I intervene again? It seems to me that books
are being produced as being of value to the engineering profession. I
would like to have a look at it.

THE COURT: I thought I had stated what I understood to be the
proper method of using such books or publications. However if coun-
sel in cross-examination desires to use it in his own way he may go
ahead even to the extent of reading something from a book which has
not either been shown by evidence or by the admission of the witness
20 being cross-examined to be what he recognizes, as what we call, an
authority.

MR. WOODS: I assumed that was implied in the dean's answer.

Q. But do you recognize this publication as being an authoritative
publication upon the subjects of which it treats? A. May I have a look
at it again just to make sure? Yes, this is a publication from the
Bureau of Public Roads Department of the United States Department
of Agriculture and is a publication of high repute.

Q. And it is used by your Department as a reference book? A.
Oh hardly that—hardly a reference.

30 Q. Now in this article which is headed "Freezing and Thawing of
soils as penetration"—

MR. SMITH: I am sorry to be obstinate, but who wrote the
article?

THE COURT: I think it would be quite wrong to read it to the
witness so it will be taken down into the record without knowing any-
thing about it but if he desires to do so, go ahead.

MR. WOODS: By Stephen Taber, Professor of Geology, Univer-
sity of South Carolina, Columbia, S.C. "Public Roads. A Journal of
Highway Research. U.S. Department of Agriculture." Now is that an
40 authoritative statement from that gentleman? A. I don't know the
gentleman. I would assume by the fact of the appearance of the

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56

Robert
Starr Leigh
Wilson,
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*
—
Defendant's
Evidence
—
No. 56
Robert
Starr Leigh
Wilson,
Cross-Ex-
amination
continued.

article in there and depending on the nature of the article somewhat that it is probably an article that should carry some weight. Occasionally one would modify that point of view after reading an article. And may I add that I do not happen to be familiar with that particular magazine in spite of the fact that it deals with public roads, and public roads and highway construction is one of my courses.

THE COURT: Now do you think you have got sufficient from this witness to allow you to read it to him?

MR. WOODS: I asked to be permitted to. If it is not of any value in view of what he said I do not intend to read it. 10

THE COURT: Would you think with his answers you have a right to?

MR. WOODS: I would think so.

THE COURT: Well if you think so I will let you go ahead and do it, at your own risk.

MR. WOODS: I will take your Lordship's ruling on it.

THE COURT: Well I am not allowing you to do it. I will not take the chance of stopping you.

MR. WOODS: Then I won't take the risk.

Q. Will you just explain this to me. Looking at Exhibit 28 again. 20
Will you describe to us this tapering subsidence down to the broken weld from the dresser coupling—the tapering subsidence? A. I did not name the dresser coupling as a limit.

Q. Well where would you put the limit? A. I suggest that the limit on matters in a measurable way is of the order of between twenty-five and forty feet centered on the weld.

Q. But the subsidence as I gathered you told us quite clearly is apparent on that Exhibit 28 on the assumption of the pipe line originally lying horizontally between the two dresser couplings? A. Yes.

Q. Assume that to be so, that it lays straight when it was pulled in 30
—an eighty foot pipe pulled in—that it was straight and commercially level from the one side of the street to the other. That is to say where the dresser couplings were. I am asking you, taking that as being true, because that is the evidence given as to how it was, by the defendant's witnesses. Now that being so you now know how the pipe lay on the 18th of June as shown on Exhibit 28? A. Yes.

Q. And there has been then a tapering subsidence from each side of that street to the middle of it, hasn't there? A. That does not follow.

Q. Let us get agreed on this, that on the assumption that that pipe was level as I have said, that this Exhibit 28 shows a grade down of 40

that pipe from the dresser coupling to the middle of the street as found on the 18th of June. That is so, isn't it? A. The shape of the pipe on the 18th of June is quite certainly not the shape that the pipe had just before the moment of fracture.

Q. You are not answering my question. I am asking you about the 18th of June. You can develop all this in answer to any other question that you like but I am asking you whether on the 18th of June as shown on this Exhibit it is not a fact that that solid line—that yellow solid line, runs from that dresser coupling in a grade down to the broken welded joint and from that grade up to the other dresser coupling? A. Yes, in a very flat "V".

Q. Now assuming for the purpose of my question that the position of the pipe on the 18th of June was not substantially different from what it was on the 21st of February when it broke. Assume for the purpose of my question that the amount of sinking that happened between the 21st February and the 18th of June was not substantial, then I am right in suggesting to you that on the 18th February the pipe would lay in that trench or in that tunnel in the shape of a very flat "V", the tops of the "V" being the dresser coupling? A. It is an impossible assumption.

Q. Just what do you mean by that? A. In order to break, the pipe had to be bent. It had to be bent into a curve at the point of fracture before the fracture occurred. Immediately the break occurred stresses were relieved and the pipe behaved like the two parts of a springy structure and it changes shape immediately to adjust itself to the fracture and whatever else may be holding it.

Q. Now have you finished? A. Yes.

Q. Does your answer mean any more than this, that at the time of fracture there would be a break in that and the pipe at that point would settle a bit more? A. Just at the point of fracture and in the immediate vicinity the effect following the break is that the previously bent pipe in a bow shape indicating where the fracture is going to occur—as with my finger tips—those are going to straighten and they will be directed downwards to form the bottom of this flat "V".

Q. Very good. A. Accompanying that. Do you want me to describe beyond that?

Q. For my purposes you have answered my question. You have described the action that would take place at the time? A. Just locally.

Q. Now at that time looking at that Exhibit 28 would you not agree with me that on the 21st February there would be a grade downwards from the dresser couplings on each side towards the centre of the street? A. I described that this morning.

Q. Can you answer that? I asked whether you agree with me or not. I think I am entitled to a categorical answer. I said any kind of a grade downwards? A. I will give you an answer to that in just a moment. An

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56
Robert
Starr Leigh
Wilson,
Cross-Ex-
amination
continued.

undulating grade towards the centre of the pipe from either dresser coupling is the best I can give you there.

Q. An undulating grade? A. Yes, generally downwards.

Q. Towards the centre of the pipe. Now that grade then down to the centre of the pipe goes for forty feet one way and down from the other dresser coupling forty feet from the other side, doesn't it? A. Relatively, yes.

Q. Now what explanation or suggestion have you got, in the light of your answers to me, that that depression did not extend over eighty feet but only extended possibly over twenty feet. A. Because the pipe 10
broke.

Q. Yes, but I am speaking of the condition of things before the pipe broke. We have a pipe there before it broke on the 21st February in the condition you have described and if I have understood your evidence rightly, the effect of this subsidence you have given evidence of would only or might only affect an area in that pipe of twenty feet? A. Yes.

Q. Then why should there be a flat "V" for eighty feet of the journey of that pipe from one side of the street to the other? A. For the very simple reason that the flat "V" was viewed after all cover had been removed from the pipe and the removal of that cover almost certainly 20
changed the shape of that pipe throughout the most of its length.

Q. But you have described the pipe, as I understood, before the thing broke as being on a grade down from the dresser coupling to the centre of the street? A. Undulating.

Q. All right. So long as it is a grade downward is what I am interested in. Now that is a distance as we have it of eighty feet. Then how does that condition for eighty feet of pipe come about by reference to a condition of affairs as to subsidence that might only affect twenty feet of it, at the outside, even assuming this fan shaped business of yours is correct? A. The removal of the covering affects what we saw on the day 30
in June. And it is more than certain that what we saw in June was different from what existed the day before the fire.

Q. Is that the whole of the answer? A. The pipe in June when we saw it had been straightened because of its inelastic condition, because of the removal of all of the overlying cover and the fact of fracture at the centre and the fact of dresser couplings at the ends; whereas the condition before the fracture took place was that we had something closely approximating a double reversed curve between those two dressers with the bottom-most bowing at the middle of the length between the dressers.

Q. Well I am quite satisfied that you must think you answered my 40
question but it may be that I am dense. I cannot find any semblance between your answer and my question. There is a street eighty feet wide and there is a pipe eighty feet long and we have that pipe going down gradually to a point near the centre of the street from each side of the street. Now you have described the condition of affairs down here un-

derneath by reference to the city sewer system. That, you say, and your theory is it affected the ground above it and right up as high as the pipe, eight feet up, I gather it would be, and that it affected it in such a shape that notwithstanding the cavity underneath was of small dimensions nevertheless it widened out towards the top and might affect an area of that pipe of twenty or twenty-five or thirty or thirty-five feet, and I don't know whether you went as high as forty. A. Twenty-five to forty.

Q. You did go down as low as twenty with me. But I am taking the twenty as my figure, and when you saw that pipe in that shape and before the break—how is that pipe being in that shape before the break accounted for by a condition of affairs underneath it which might only affect twenty feet of it? That is what I want to know if you will give me an answer to it, and I cannot find in your last answer that the answer has any relation to the question? A. I am trying to think of a way of presenting the thing quite simply. The material overlaying the pipe when it was still in service is capable of exerting a pressure on the top of the pipe which may variously be estimated as lying between about three-hundred pounds up to about fourteen hundred or fifteen hundred or more pounds per lineal foot of pipe. And this weight becomes active in bending the pipe to the point of destruction only as lack of support or subsidence of the supporting material below the pipe will permit. The geometry, that is, the shape of the pipe, will adjust itself within the limits determined by the amount of subsidence over the middle part of the pipe and the amount of this weight—this possible weight above, which is available to force the pipe down towards the subsided support. Does that answer you?

Q. I give it up.

MR. SMITH: So does the Dean.

MR. WOODS: I have no more idea of that being an answer to my question than if you were talking in the Greek language. Frankly, I tell you. It does not seem to have any relation to the question.

Q. Now you spoke of this pipe as it stood before the break laying in a double reverse curve. Is that right? A. That is my estimate of what obtained there immediately prior to the fracture.

Q. Will you draw on a piece of paper a double reverse curve? A. (Witness draws sketch as requested by counsel). Here is a double reverse curve rather crudely drawn, perhaps. I am sorry.

Q. Now I would gather that your suggestion that the pipe lay in a double reverse curve which you put on a piece of paper amounts to really some suggestion that you have already made in evidence that the depression in the pipe was confined to this area of twenty or twenty-five or thirty-five or forty feet? A. That is it.

Q. And it is based on that same theory? A. Naturally.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 56
Robert
Starr Leigh
Wilson,
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 56
Robert
Starr Leigh
Wilson,
Cross-Ex-
amination
continued.

Q. So that you are only assuming that the pipe, if your theory is right then the pipe had to lay in that double reverse curve? A. I have no doubt it lay in the double reverse curve.

Q. Because you have no doubt that your theory of subsidence caused by the city's tile sewer is the proper theory to adopt? A. I believe so. I believe so.

Q. And the conclusion that you have arrived at and of which you have given evidence to the Court that this sinking is to be charged to or to be accounted for by the 1931 construction of the City of Edmonton has been come to by you, as I take it, not by seeing evidence of that subsidence at all, but because you have taken the various other elements or stresses that in your estimation this pipe was subjected to and that you find that these stresses are not sufficient to account for the breaking in the pipe? A. Yes. And I have in mind that the breaking of the pipe was a typical bending failure. 10

Q. And your conclusion is, as you will I think frankly admit, very much affected, if the fact is that there was in fact no sinking of the soil above that weir chamber? A. I will have to ask you to repeat that. I am sorry.

Q. I do not mind repeating it. There has been evidence, as I told you before, of the three witnesses given here that soil above the weir chamber was undisturbed—was in its virgin condition, there had been no settlement—now that fact, if that is taken to be a fact is quite inconsistent with your theory, isn't it? A. They did not say the thing was undisturbed. A roof was undisturbed, according to their statement. There was a hole there. 20

Q. Well assuming they did say what I have said, then it is quite inconsistent with your theory. A. I want to be accurate and I want to be careful. Assuming if I may be permitted to repeat a part of your question, assuming there was absolutely undisturbed soil above that weir chamber and that we have no other evidence of cavities anywhere else in the immediate vicinity then I would not know what to say as to why that pipe broke. 30

Q. It could not have broken by reason of the city's construction? A. There would have to be a new investigation then and I do not know where I would start.

Q. Your theory would have to be discredited. A. My theory is dependent upon the subsidence.

Q. And necessarily upon the settlement above the weir chamber? A. Movement—yes—settlement. 40

At 4:20 Court ajourns till 10:00 a.m. Wednesday, January 31st, 1934.

Wednesday, January 31st, 1934, Court resumes at 10:00 a.m.

No. 57

Evidence of Alan Emerson Cameron,

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 57
Alan
Emerson
Cameron,
Examina-
tion.

ALAN EMERSON CAMERON being called as a witness on behalf of the defendant and having been duly sworn was examined by Mr. Smith and testified:

Q. You are a Professor in the Alberta University? A. Yes.

Q. Teaching what? A. Metallurgy.

Q. And I take it Metallurgy has to do with metals and their strength and that sort of thing? A. Yes.

10 Q. What institution are you a graduate of? A. McGill University and Massachusetts Institute of Technology, at Boston.

Q. MR. WOODS: We will admit Dr. Cameron is a graduate in Metallurgy.

MR. SMITH: Graduating first, as what? A. As mining engineer at McGill and Doctor of Science in Metallurgy at the Massachusetts Institute.

Q. How long have you been teaching at the University of Alberta? A. Since 1914.

20 Q. You had occasion to make certain investigations after the Corona Hotel fire? A. Yes.

Q. And you collaborated in that with Dean Wilson? A. Yes.

Q. And would you mind just telling me what you did. I want first to discuss—what did you do? A. The pipe was raised in June, 1932 and we had three pieces cut from the pipe approximately five feet long, each piece carrying a weld which joined the pipes together. That is to say, each piece contained one of the welds. The welds on each side of that which failed were taken to the University and from them we cut coupons approximately two feet long and those coupons were tested in the testing machine under the accepted method of testing flat plates. The results of those tests indicate that the pipe metal stress at the time of fracture would average twenty-nine thousand one hundred pounds per square inch. Failure in each case took place through the weld. We also had the weld which fractured at 107th Street cut out from the pipe and the small remaining pieces which had not torn apart were cut away from the fractured portion.

30 Q. And has now become Exhibit 43? A. And has now become Exhibit 43. We felt that that piece had been subjected to such unusual conditions in the way of bending and twisting during the processes of handling that it would not give us coupons the results of which would be reliable and therefore did not cut coupons from that piece.

40 Q. And since then a coupon has been taken from Exhibit 43 and has become Exhibit 68 in this case? A. Yes that small piece was taken out for microscopic and other examination since the beginning of this trial.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 57
Alan
Emerson
Cameron,
Examina-
tion.
continued.

Q. And Exhibit 84 which was put in yesterday is what? A. Is a photo micrograph of a cross section of the weld taken on that piece of metal there, Exhibit 68.

Q. Did you preserve the coupons? A. Yes, sir, I preserved the coupons.

Q. You did not preserve the whole coupon? A. I preserved the section of the coupons in which the fracture occurred, namely the basis of the weld metal.

Q. And did you make comparisons between the unfractured welds, that is the two on either side and the weld which failed? A. Yes, sir. 10
Having obtained the pieces from the coupons I made a very careful physical examination of the surfaces of those fractures. I measured them with the aid of a microscope. I studied them from the viewpoint of penetration and welding technique, and I compared them or endeavored to compare them with the surface of the fracture as shown in the weld which failed.

Q. And that is Exhibit 42? A. Yes.

Q. Now you might take the fractured coupons or one of them, or more if you see fit. You have them marked to indicate from which weld they came? A. Yes, sir. 20

Q. That is the east one or the west one? A. Yes.

Q. And just show to his Lordship the sort of comparison you carried out, in a way that we can understand you? A. This is the fracture of the weld which failed. The numerous pieces here represent the pieces from the coupons. There are two from each coupon and four coupons from each weld, which means sixteen pieces and sixteen pieces of one and one-half inches would give us not a complete representation of this but a fair proportion.

Q. By "this" you refer to Exhibit 42? A. Yes, Exhibit 42. And you will note, comparing these fractured surfaces that the weld coupons 30 also show the lack of complete penetration in that weld. They also show a certain amount of gas cavities and also of slag inclusions. Some are porous and some are relatively soft. The thickness of the weld metal as shown on the fracture from that surface to the contact line with the pipe metal there on the whole is slightly less than it is on this weld, Exhibit 42. Also it appeared from the examination under a low power microscope that the number of gas cavities and slag inclusions in Exhibit 42 were no more, if as many, as on the average of those various coupons. That was my visual inspection. I measured or attempted to measure as close as I 40 could the thickness of the weld metal on Exhibit 42 and on each of these. In all I took 39 measurements around the periphery of forty-two and I took an average of five measurements of each fractured surface of each coupon. That gave me forty measurements on the four coupons from one weld and forty measurements on the four coupons on the other welds to compare with thirty-nine measurements around Exhibit 42—

THE COURT: Why do you use the plural "welds"? A. There are three welds. There is the weld to the west. In the string of four pipes there were three welds to connect them together and there were four coupons from the weld and four coupons from the east weld.

MR. SMITH: These coupons were from what? A. From the weld to the east and from the weld to the west. They are marked in such a way one would be the weld end of pipe No. 1, coupon No. 3.

Q. Will you just show me one at a time on Exhibit 28? A. The weld which failed is marked there. The east weld would be that one and the west weld would be this one here (indicating). That completed my physical examination of this and from the surface appearance from a study of the fracture I could see no difference between this surface and the surface of these adjacent welds.

MR. WOODS: The surfaces in Exhibit 42? A. Yes, and the surface of the adjacent welds.

Q. MR. SMITH: These are all numbered? A. Yes, so that each can be put in its place.

Q. So they may be all marked as the one exhibit?

Twelve fractured ends from coupons cut from welds adjacent to fractured weld, marked Exhibit 85.

(Answer continued): I then had a small piece taken from this weld which did not fail and I made microscopic examinations the results of which are found partly in those photographs.

Q. You mean such photographs as Exhibits 45, 46 and 84? A. Yes, sir. Those are photographs taken at a relatively low magnification. I think they are of about three and one-half magnification. I also made micro-structure studies at higher magnifications and examined them as carefully as I could—the typical sections of the weld metal and the pipe metal and the junction between the weld metal and the pipe metal in those sections. And that micro-structure failed to reveal any apparent differences between the structures of the welds which had not failed and the weld which did fail. I therefore felt that we were safe in assuming that the weld which actually fractured would stand a pipe stress equal to the pipe stress found by the coupon test on the welds which did not fail.

Q. Referring to Exhibits 45, 46 and 84, which are photographs of these three welds, all three or three and a half times magnification. Now will you look at those photographs as you have already looked at this piece of metal, Exhibit 68, and tell me whether the weld which failed, Exhibit 84, compares favorably or otherwise with the two welds which did not? A. Exhibit 45 is a section of the weld on the west side of 107th Street. It shows a "V" notch running in at the junction of the two pipes and it shows considerable cavities above that "V" notch, that is, towards the junction of the weld metal and the pipe metal. The cavities that are

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57
Alan
Emerson
Cameron.
Examina-
tion.
continued.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 57
Alan
Emerson
Cameron,
Examina-
tion.
continued.

here, though, that are shown here, are appreciably larger than they actually were because in order to bring them out the specimen was etched rather drastically. Exhibit 46 is a cross section of a specimen from the east weld. It shows the junction line again and it shows smaller sized gas cavities, in part because they were not etched so deep and in part because they were not as large as the others. Comparing Exhibits 42 and 85 there has been—we have seen that there is considerable differences in the relative amount of gas cavities and slag inclusions at different sections and as those specimens were taken by chance or haphazardly they represent only one cross section. We may have missed the gas cavities here and found them in the other specimen. Similarly with Exhibit 84 this section shows an appreciable—shows a very small amount of separation between the ends of the pipe. As a matter of fact it is barely visible at all. The actual specimen shows the section a little bit better than the photograph because there is a slight crack running up from the top of the “V” into the metal, which of course would photograph black in the figure and therefore does not show up in detail as it should otherwise do. But there is a slight crack running in from there and it shows here to the other side. But the significant point of that is that it does not run vertically to represent the junction between the ends of the pipe and it drags in on an angle, indicating that that is a tear rather than a separation between the two pipes and it is undoubtedly the incipient fracture due to the bending. 10

Q. Will you repeat what you said about the crack? A. The little crack that appears on the specimen runs in vertically or at right angles to the welds of the pipe but it runs at a definite angle towards one pipe. Now that indicates to me that that line does not represent a lack of fusion of the two pipes together but it represents the tear which is developed in the handling of this specimen when it was being picked up and carried around with all the weight of the extra pipe metal, at least parts of it coming here and tending to give it a bending movement. 30

Q. You mean at the time of and after the removal of the pipe? A. At the time of and after the removal of the pipe, I mean.

THE COURT: When you spoke of incipient fracture, what did you mean? A. There is a small fracture running in here which is just a hair line crack which you can see running from the tip of the “V” in perhaps one-tenth of an inch and it shows on this side perhaps a little better. You can see that it runs in to about there.

Q. Is that what you have been referring to just immediately before this as what you say did not indicate a separation? A. I mean that this particular specimen does not show that same straight line of cleavage between the two pipes there as the east weld shows. Now I do want to point out that this is a haphazard section and is hardly an average of the whole of the surface of Section 48. But the indications are clear in my mind that the welding conditions, that the method of welding and the 40

type of weld produced as shown on Exhibit 42 was equivalent in all respects to the welds east and west thereof on the string of pipes, and on that basis I assumed that stresses which would break this weld as shown on Exhibit 42 would also break the welds on either side of it.

Q. MR. SMITH: In other words, you have concluded that the three welds are practically of equal strength? A. Yes are practically of equal strength.

Q. And that the one which did fail was at least the equal of the other two? A. Was at least the equal of the other two.

10 Q. How was this pipe removed? Put it so that I can understand it. What I am coming at is this. If we look at Exhibit 43 it is plain that it is cracked to some extent. I mean it is visible to the eye on either side of this big piece of metal (Exhibit 43)? A. Yes, sir.

Q. And it is a fact that the portion of the pipes which we have not got here were completely fractured and are represented by Exhibit 42? A. Yes.

Q. So that when this pipe was removed from the ditch, these four lengths, in June, the only thing which was holding it would be Exhibit 43? A. Approximately, yes, sir, except that as great care as possible
20 was taken to put no strain upon Exhibit 43. We did not want to break it if we could help it and we were fortunate enough in getting it out without breaking it. The string of pipes was lifted bodily from the trench and the three pieces each containing a weld were cut out with the oxy-acetylene torch after the pipe had been lifted out of the trench and put on to the road side.

Q. You have heard the evidence of Mr. Ewertz? A. Yes.

Q. And you have heard the idea advanced by him as to the increase in the power necessary to separate the pipe as such—that is pulling the whole pipe? A. Yes, sir.

30 Q. The difference between that and the power necessary—the proportion of power necessary to separate a coupon from that pipe? A. Yes, sir.

Q. And I am asking if you agree with the principle enunciated by him? A. I do sir. I think that Mr. Ewertz' method gives us a true test of the strength of the weld metal as differentiated from the pipe metal. It is a measurement of the force which broke the weld metal itself.

Q. Was it new to you? A. Yes, sir, that method had not been considered by us at all. It seems to me to be a reasonable method to obtain the strength of the weld itself.

40 Q. Now have you and I anything more to say about welding? We have had many conversations about it and I have got to rely on you more than on myself to cover the various points in mind. That is all I can think of? A. Well as to an interpretation as to the quality of this weld I am not prepared to say that I can give an authoritative opinion upon welds. That is to say, my personal experience has not been on welds; it

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57

Alan
Emerson
Cameron,
Examina-
tion.

continued.

has been on metals. But these welds have all the appearances that I can find in the literature pertaining to collar welds, the penetration.

MR. WOODS: I suppose we would be willing to take Mr. Cameron's opinion on almost anything, but as he has said he is not an expert on welds, I do not think he should give evidence on that subject.

MR. SMITH: Have you made it your business to examine every authority you can find with respect to welds? A. Yes, sir.

Q. And did you make the trip down east since this fire? A. Yes.

Q. And did you visit various plants with a view to studying welding and the advances in that art? A. Yes, sir. I visited the research laboratories of the chemical—of the Union Carbide and Chemical Corporation in New York. 10

Q. And is that—A. It is recognized I believe as the outstanding research laboratory in welding on this continent.

Q. And did you discuss there with persons who were advanced in the art of welding? A. Yes, sir.

Q. With respect, I now submit that Professor Cameron may make the explanation which he had begun.

THE COURT: I suppose, Mr. Woods, it is only a question of the force of the answer which he may make, having regard to his previous study if, as I understand him to say, the recent study he has made puts him in a position that he can give a theoretical opinion notwithstanding his professed lack of practical experience. I suppose I should hear it. 20

MR. WOODS: My Lord, we all recognize, I think, that welding as such is a most technical business. Now if my friend Mr. Smith and I went down to the Union Chemical Laboratory in New York and stayed there for six months we should not know much about it because we have not got the previous knowledge necessary. Now I am perfectly willing to accept Mr. Cameron's own statement whether he thinks that under his previous experience in metallurgy and his recent experience in the Union Carbide shops, whether he can give valuable expert or opinion evidence on welds. And if he says he is, that is the end of it. 30

THE COURT: Now what is your answer? Can you answer, first, whether you consider yourself competent to give the opinions you intend to give? A. Yes, sir. My interpretation of the structure in the weld metal and in the pipe metal was that that weld had been put on in a very satisfactory manner. We have to realize that in the process of welding, the metal is liquefied, it is fused. And we have also to realize that when that fused metal solidifies it has the appearance of a cast metal rather than the appearance of a worked or wrought metal such as the pipe metal. Now cast metal has less strength than the same metal in the wrought form. And the average strength of weld metal material, welding rod, which was used at that time and a lot of which is used 40

today, would not exceed 40,000 to 45,000 pounds per square inch. The test referred to by Mr. Ewertz shows to me that the weld metal in these welds broke under a stress of about 39,100 pounds per square inch. When we consider that the cast metal had a less strength than the wrought metal—

MR. SMITH: Which was the rod? A. Which was the rod—these facts indicate to me clearly that that weld metal was put on the weld in an exceedingly satisfactory manner because it shows a weld metal strength of 39,100 pounds and we could not expect the cast metal to
10 have a strength in excess of 40,000 to 42,000 taking into account the loss in strength between the wrought form and the cast form.

Q. Now did you, having found the breach or failure in the weld, then make an effort to determine the cause of that failure? A. Yes, sir. With Dean Wilson we attempted to search all the available evidence to find some cause or combination of causes which would put into that pipe at the point of fracture a stress equal to the strength of the weld as we had determined it by this comparison with these coupon tests.

Q. And taking those various stresses which you considered—the temperature stresses, the weight of the earth, the weight of the cover
20 whatever it was, the frost bond, the earth bond and the effect on dresser couplings—having added those together at their maximum am I right in saying you could not find anything there which would break this pipe?

MR. WOODS: Opinion evidence was asked for on one of the branches. I think that I made it quite clear I have no objection to his giving evidence on the welding process. But as I gather from this question it involves or includes the giving of opinion evidence or expert evidence upon the same line that Dean Wilson gave—I think I am right
30 in that—that is to say, it involves the whole matter of the pipe laying and construction as well as the matter of the welding. And that being so I want to make it quite clear that the evidence given by this witness in respect of the pipe construction and laying, whether it is good or bad or negligent or otherwise; is in my opinion not capable to be given at this stage for the reason that the defendant has already given three expert opinions on this subject—Mr. McArthy, Mr. Hill and Dean Wilson.

THE COURT: I do not understand that this particular line of evidence the witness is now going into was on the point you have just mentioned. I rather gathered it was on a later stage of it, namely as to the ascertaining by him, as he puts it, of a cause or combination of
40 causes which might have caused the break to occur. That is what I understand.

MR. SMITH: I am not going to ask him about laying pipe.

MR. WOODS: Well I am making the objection so it will stand.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57

Alan
Emerson
Cameron.
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57

Alan
Emerson
Cameron,
Examina-
tion.

THE COURT: Mr. Woods is quite right about the other part of it. I think you have exhausted your opinion evidence on that.

MR. WOODS: My point is, and it is not an easy point to determine at all—is just exactly where this matter begins and ends, and I do not want to have it go in without objection. It seems to me we have two matters of expert testimony—expert opinion—being given in this case. They classify into the question of pipe laying and construction and the effect of pipe laying and construction, as well as the city's pipe laying and construction. And the other matter is the matter of the efficacy of the weld, and I think each party is entitled to three experts on each of these subjects. But having regard to Dean Wilson's evidence yesterday which I believe this evidence is intended to—it really involves—
an answer to my friend's general question—really involves the giving of an opinion as to the pipe construction in the way it was constructed, the effect on soils, the effect on the drainage, the effect of subsidence and in fact the whole matter of pipe construction—city pipe construction and company pipe construction, and while I quite realize the difficulty the court is under with respect to saying that this expert evidence through all this branch and therefore on the proper question of laying the pipe, I am making the objection. It does seem to me that you have to group the things in larger groups than that, because it seems to me you may have three men on each subject such as the effect of frost and subsidence and such as that. 10 20

THE COURT: As I understand, there is no power in me to increase the number as there is under the Dominion Act.

MR. WOODS: I think that is true, my Lord.

THE COURT: Am I right in supposing that the evidence you are now intending to lead relates to the possible exception to a rule which may arise—I am not expressing any view about the matter at all—that may arise, namely the exceptions that arise from what is sometimes called the act of a stranger or, as Lord Dunedin in *Dominion Gas and Collins* put it, "The conscious act of another volition?" 30

MR. SMITH: Yes, my Lord. Perhaps I had better stress what my views are. I have called two experts with respect to the practice of pipe laying. I have called two experts with respect to the art of welding. I now wish to deal with Dr. Cameron solely on the question of subsidence and added to that I want at the same time to ask him as an engineer as to the propriety of having underground construction underneath our pipe without support. I think that at least puts plainly before you what I want to ask. 40

THE COURT: What you have said is practically what I intended to say. I think we are in agreement as to what you are intending to do.

MR. SMITH: Yes, I merely thought I should put it in in my way just for clarity's sake.

THE COURT (After reading section): Of course if one reads the section literally—

MR. WOODS: It is rather drastic. May I incidentally to your Lordship's remark in connection with the matter of the law with respect to the act of a stanger—may I remind you that the evidence of Dr. Wilson not only goes to that matter but in my estimation it goes to the question of whether the defendants have rebutted the presumption
10 which arises on the facts of negligence?

THE COURT: Do not misunderstand me, Mr. Woods. I tried to not even hint at my view of the legal position because I recognize all the difficulties that must be present to both of you.

MR. WOODS: And I do not think Dr. Cameron has been qualified nor do I think he would suggest he is an expert entitled to give evidence upon the propriety or otherwise of laying gas pipes in the place that this gas pipe was laid, or the effect of the sewer or trench or anything else. He has qualified at metallurgy.

MR. SMITH: I want to call evidence as a mining engineer to tell
20 me the effect of such work as this.

THE COURT: Oh I think the circumstances are such in this case that my course ought to be to allow you to give the evidence subject to the objection, but to say this to you, that it seems to me a ruling of that kind differs from, and is consequently more dangerous than the usual ruling as to admitting evidence subject to objection, because of the statute. In other words, I will have to put it to you to take your chance, on my admitting the evidence, being wrong.

MR. SMITH: That seems quite reasonable, sir.

MR. WOODS: Of course there is a case, I think it is in the Court
30 of Appeal and I think my memory is right, that unless I take the objection I would not be entitled to object to the experts called outside of the statutory limit.

THE COURT: Yes. In other words, notwithstanding the positive limitation of the statute it might be waived by non-objecting.

MR. WOODS: That is what I had in mind.

MR. SMITH: I am sure none of us want to have a mis-trial after proceeding for this length of time. I am going to make a suggestion to you and that is that we might adjourn for a few minutes to enable me to re-consider.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 57
Alan
Emerson
Cameron,
Examina-
tion.
continued.

THE COURT: Your difficulty lies much further. I might be wrong.

At 11:00 a.m. Court adjourns.

At 11:20 a.m. Court resumes.

MR. SMITH: As your Lordship pleases. If I interpret your ruling correctly it is I am able to proceed if I wish it. I intend to ask the witness questions confined to the behavior of the ground—really a subsidence of the earth.

THE COURT: Qualifying him to do so first.

MR. SMITH: Yes. 10

Q. You said you were an engineer? A. Yes, sir.

Q. Are you a geologist? A. I have done a considerable amount of geological work.

Q. And have you had to do with the behaviour of soils? A. Yes, sir.

Q. Moisture in soils? A. Yes.

Q. And quality of soils? A. Of ground—of clays rather than soil.

THE COURT: I think Dr. Wilson said "behaviour of earth." A. Yes, sir, earth and ground, as distinguished from soil—the surface covering. 20

Q. MR. SMITH: We have got something over here, Dr. Cameron. This is a twin of something that is already in. What is this? A. This is a model of the intersection of 107th and the lane south of Jasper Avenue.

Q. And I am asking you, looking at the top of this thing, I am asking you what the curved board over there is? A. This curved board indicates the curve from 107th Street to the lane going east towards the Corona Hotel.

Q. Is that the curb? A. Yes, that is the curb.

Q. And the black spot is what? A. That is the manhole cover from 30 manhole "A" that has been described.

Q. And the other one? A. That is manhole "B". We have attempted to make the top of this correspond to the levels of the pavement. That is to say, it is curved approximately to level of the pavement as closely as we could determine.

Q. And you have a map of that? A. We have a detailed map of this portion of it. We had a general survey of the whole too.

Q. Now looking at the model. Did you have supervision over its construction? A. I had general supervision over its whole construction.

Q. And on what scale is it? A. It is on the scale of one inch to one 40 foot.

Q. And is it accurate? A. It is as accurate as the information we could obtain would allow us to make it.

Q. And the information came from— A. It came from Mr. Haddow's office and from independent surveys which we had made.

Q. Now having regard to the other model which is already in evidence I wish you would point out to the Court the differences there are in the two models. A. I think, sir, the main differences lie in the presence of this pipe which I do not think is shown on the other exhibit and in the fact that we have attempted to keep as closely as possible to the
10 outside dimensions of the pipes and other constructions that are there.

THE COURT: "This" pipe being what? A. Oh well I believe it was added afterwards. The dimension of this I think you will find—

MR. SMITH: You mean— A. Of the tile sewer overflow from manhole "A" to manhole "B" is an outside dimension and the pipe and my understanding is that the other represents an inside dimension. The essential differences however in the two models is in the size of the weir chamber itself. The measurements here are outside measurements as near as we could determine. The inside of the weir chamber is three feet from the inside wall of the manhole "A" to the inside of the north-
20 east wall of the weir chamber and we have added nine inches as a wall thickness. The dimensions of that weir chamber are we believe more accurate than the dimensions of the weir chamber shown in the other exhibit.

THE COURT: I think there is some evidence that the weir chamber in the model should have been increased somewhat in size?

MR. WOODS: Yes.

Model furnished by defendants of underground utilities at intersection of lane and 107th Street, marked Exhibit 86.

Q. MR. SMITH: Did you from a metallurgical standpoint examine
30 the pipe underneath this street? A. Yes.

Q. And did you find it to be pipe of good quality? A. Yes, sir.

Q. Now I believe you made a visit down to the bottom of manhole "A" on an occasion when you were there present with Professor Morrison and Mr. Haddow? A. Yes.

Q. On what date? A. I believe on July 7th, 1932.

Q. You have a notebook? A. Yes, sir.

Q. And did you make those notes at the time? A. At the time.

Q. And with his Lordship's permission you may refer to that to refresh your memory. Now upon going down the manhole did you enter
40 the weir chamber? A. As much as I could get myself into it, yes, sir.

Q. Now you might just use this model which is Exhibit 39 and show to his Lordship—was there an opening made in the face of the weir

chamber, I mean that portion which faces manhole "B"? A. Yes, sir, as marked by Mr. Haddow on Exhibit 39, there was an opening approximately in this position.

THE COURT: That is marked "Y"? A. Marked "Y", yes.

Q. MR. SMITH: Then I want you to open this model and show the Court just what you did on that occasion. A. When I was in the manhole there was only room for one to be present in the weir chamber itself at a time and only room for two conveniently in the manhole. Mr. Morrison therefore, if my recollection is correct, was on the surface when I was below with Mr. Haddow. I climbed into the weir chamber and was able to sit on the weir and lean forward to view through this opening. I then also reached in with my hand and with a hammer—as I remember it was a machinist's hammer which was available, obviously the hammer which had been used to aid in the cutting out of this hole. And I attempted to search the size of that opening by feel. I could not both see and feel at the same time nor could I put my head in far enough to look around the corner but I could see in straight ahead of me and I could feel around vertically. 10

Q. How long was the hammer? A. Approximately fourteen inches. It was an ordinary machinist's hammer of about that length. I reached in. I had to reach in with my right hand and I am very conscious of the fact it was my right hand because I am normally left-handed. I could reach in and going through that wall with this portion of my arm, that is my upper arm, with my shoulder against the wall as close as I could get it it was not touching the northeast wall, but very close to it, I could reach in and holding the hammer up I could feel no obstruction to the hammer as I carried it down and up as far as my arm would go. I could not get back far nor could I get down very low for the same reason. 20

THE COURT: You are speaking of your forearm? A. My forearm, and the hammer and my position would be of that order (holding hammer). 30

Q. MR. SMITH: Could you on that occasion reach the top of that opening? A. I could not find the top of that opening in that position in that form. I could see when I looked in—I could see the slope of the ground coming up from the opening towards the top of the opening.

Q. THE COURT: Sloping which way? A. Upwards from the bottom of the little opening here. It seemed to slope up in that direction.

Q. MR. SMITH: And did you call the attention of anyone who was with you to that space at the time? A. Yes, I called Mr. Haddow's attention to it and he recognized it as that space. 40

Q. MR. WOODS: Don't say what you said to Mr. Haddow.

MR. SMITH: No. I just asked if you called his attention to it. Now we heard of another examination that was made and when a space was revealed above the weir chamber, an opening was made above the weir chamber in the manhole and Mr. Haddow said there was a space extending up in the neighborhood of this pipe. What is that pipe? A. That is the drain from the northeast catch basin from the pavement on 107th Street to the manhole "A".

Q. And that space is marked on an Exhibit prepared by Professor Morrison. I am referring to Exhibit 41. A. Yes.

10 Q. Which is cross hatched in lead pencil and was placed there and Mr. Haddow wrote the words "cavity observed by Haddow?" A. Yes.

Q. As I understand it you were not there on that occasion? A. No, sir. My notebook on that occasion states—

Q. I do not want you to refer to your notebook at all. You may refer to it to refresh your memory. A. Having observed this—

MR. WOODS: What is "this?" A. The cavity lying in front of this hole—in the weir chamber. I called Mr. Haddow's attention to it.

Q. MR. SMITH: Was there any opening in the manhole wall when you were there on the 7th of July? A. No, sir.

20 Q. And there is no doubt that you observed this hole through the weir chamber and there was no other opening in either weir chamber or manhole on the day you were there? A. Not that I observed, on the 7th of July. That was the opening in the northeast wall of the weir chamber.

Q. On Exhibit 28 I observe this statement: "In July 1932 at the request of I. F. Morrison a section was punched out of the wall of the manhole "A" about twelve inches high and immediately above the roof of the weir chamber. The dirt removed was in its original state and there was no evidence of any settlement. A hole about twelve inches
30 wide, two inches high and about twelve inches long was found to be immediately above the junction of the fifteen inch tile and the weir chamber." What I want to get at is this, that you did not see any hole as described by Mr. Haddow in his plan by looking through—in fact you never looked through any hole in the wall of the manhole, did you? A. No, sir.

Q. And if such observations were made they were after your visit on the 7th of July? A. Yes, sir.

Q. Now you are aware of the construction made by the City in 1931 which includes the weir chamber and the fifteen inch tile sewer run-
40 ning from manhole "A" to manhole "B"? A. Yes.

Q. And you have heard the dimensions of the excavations given? A. Yes, sir.

Q. In order to permit them to do and to complete that work? A. Yes, sir.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57

Alan
Emerson
Cameron,
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57

Alan
Emerson
Cameron,
Examina-
tion.

continued.

Q. And you know from the evidence you have heard in the Court that at the point on Exhibit 30 marked "W" there was a broken weld in the defendants' gas line? A. Yes, sir.

Q. And you know that it was necessary at that point to raise the line six and one half inches in order to close the gap? A. Yes, sir.

Q. I think you were there? A. Yes.

Q. And how did you know when you had closed the gap? A. When the two faces of the fracture gripped a piece of cigarette paper and held it.

Q. Thin cigarette paper? A. Yes, and held it so it could not be removed without tearing. 10

Q. Now you have been asked to give consideration to the effect on the earth of the construction of that weir chamber and overflow pipe on the ground about it. And I want you to tell me what investigations you have made and what conclusions you have arrived at. A. Well, sir, when I examined with Mr. Haddow and found that cavity existing against the weir chamber wall and from my hammer felt that that cavity must extend above the top of the weir chamber, to some extent anyway, because the wall is eight inches—the roof of the weir chamber was eight inches—we were practically at the lower side of the roof. My arm went through the hole. I had something therefore in excess of fourteen inches, it may have been twenty inches, as an extension to feel with. That cavity must therefore have extended above the top of the weir chamber. That cavity indicated that there was not a firm foundation to support the ground above. And it is well known that if support is removed there will be a tendency for material to settle. There would therefore obviously be a tendency for the ground above the weir chamber to settle by virtue of the fact that that support had been removed. An attempt to determine whether settlement had taken place or not could not be made through the small opening and a complete examination in the neighborhood of that weir chamber was not possible through the small opening through which I viewed the cavity. However, an examination of the catch basin drain from the northeast side— 20 30

Q. That is the small red pipe running about midway up the model in a northeasterly direction? A. Insofar as one could flash a light from the opening in manhole "A" indicates that there was a distinct bend towards the north at a point which I could only approximate as between six and ten feet northeast from manhole "A". And with only a six or seven inch pipe with which to work it was impossible to survey that. But it had the distinct appearance of showing not only the drag to the north but also a slight drag down as though the lowest point in that line is not at manhole "A" but is at a point somewhat to the northeast of manhole "A". Now that is an approximation. It may be that this point is level with that and the slope comes up from there. 40

Q. You mean it may be that this point six to ten feet distant may

be level with the point of entry? A. Yes. But there is certainly a distinct change in grade of that catch basin drain at a point six to ten feet as near as one could approximate from the manhole and it is also out of line.

Q. Now aside from the movement of earth itself, I mean in body, in what other ways may be have subsidence? A. Well if there is an opening made at a depth in the ground then there is a tendency for the water content of the overlying ground to find its way to that low point.

10 Q. And what is the resultant condition that you find above? How would you describe it? A. The resultant condition above is some sort of a subsidence.

Q. But within the soil itself? A. It is a shrinkage of the soil immediately overlying the cavity.

Q. That is the loss of moisture content creates a shrinkage in the soil itself? A. Over and roughly in a cone shape from that cavity.

Q. Now what effect have cracks, even minute cracks, on the ground? A. Minute cracks in the ground would allow a relatively rapid water removal by percolation.

20 THE COURT: And as a consequence shrinkage? A. And increase the rate of shrinkage.

Q. MR. SMITH: And the movement of water by cracking—does it do anything else with respect to the ground? Does it carry anything with it? A. It may carry the very finely divided particles of the ground; that is the clay particles—has a washing out effect from the aggregate.

30 Q. Now have you any further observations as to anything else you have done in order to give you an opinion as to what has happened to that ground in that area? A. Those were my direct observations. There has been submitted in this trial some other surface indications of subsidence.

Q. Is there anything on the surface that is of interest to you? A. There were as I remember it some photographs submitted.

74 Q. By Professor Morrison. You are no doubt referring to Exhibits 74 and 75? A. Yes, sir.

Q. And what do those figures indicate? A. They indicate the apparent drop in the pavements both on the west side of manhole "A" and also on the east side of manhole "A".

40 Q. That flat thing we see is no doubt a straight edge? A. That is a straight edge. And the significant point to me in this picture is the relative rapid rate at which the ground drops from adjacent at the manhole to a low point and then slopes on very gradually to the north. That indicates that the manhole has acted as it were as an obstruction to a general movement of the ground downwards.

Q. Now are there any other observations that you have made, I

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57
Alan
Emerson
Cameron.
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57
Alan
Emerson
Cameron,
Examina-
tion.
continued.

mean as to the physical property? Well we had a sample taken of the clays from the vicinity or of the ground from the vicinity of that trench and I had a mechanical analysis made of that material. The mechanical analysis determined that the clay has a composition of about 70.1 per cent—

MR. WOODS: I do not know whether there is any concrete point about this but I gather Dr. Cameron is giving this evidence from information from someone else. Now if it becomes important that person might be here to give his analysis.

MR. SMITH: That may be perfectly true. The University of Alberta made certain tests and examined the pulling of these pipes, not done by Professor Morrison and Mr. Cameron. My friend is quite right if he insists. 10

MR. WOODS: Anything done under this gentleman's supervision is all right. I take it this analysis is analogous to the analysis we had made to ascertain whether there was gas in it. If it is of importance it seems to me—

MR. SMITH: It is merely to show its constituency. That is the limit to which I intend to go. If you object I won't ask the question.

MR. WOODS: I am informed Dr. Wilson gave it and it is already 20 in and so it does not matter.

MR. SMITH: You might just tell me what the constituency is? A. The analysis showed 70.1 per cent. sand particles; that is particles of a size greater than five one-hundredths of a millimeter, that being the standard method of determination for sand particles; and of silt and clay 29.9. There are voids to be taken into account also. It was of that order. Now those were taken on the dry weight of the sample and the moisture content of the clays have been determined at about sixteen per cent.

Q. In other words, after removal of the moisture the hard particles 30 were as seventy to thirty? A. Yes, sir.

Q. You were associated with Dean Wilson in making a number of calculations of which he gave evidence yesterday? A. Yes.

Q. And if anybody is interested in them they are available now and can be given to anybody to work on? A. Yes, sir.

Q. Now I want to know if you have formed an opinion as to whether or not the ground, and by that I mean the ground between the gas line and the weir chamber and overflow, subsided or not? A. We found as the basis of those calculations that so far as we could see the only way by which those stresses could accumulate in that pipe to break 40 the weld would be due to a movement, a subsidence or a settlement, of the ground below that weld for some distance on either side of it.

Q. And can you as a scientific man account for that in any other way than the one you have given me? A. I cannot account for it except on the basis that the removal of support of the overlying ground, the ground between the gas line and the sewer line, by virtue of the excavations for the sewer and weir chamber installation, the removal of that support, has allowed that settlement of the ground below the main.

10 Q. Now I want to ask you this. In your judgment is it good engineering practice to dig below our main an excavation of the size necessary to put in the weir chamber under the pipe? Do not answer me for a moment.

MR. WOODS: I object. I do not think that Dr. Cameron has been qualified to state what good engineering pipe construction is. He has stated that he is qualified to give opinion evidence about the movement of earth and so far as that is concerned he has given it. I object to this.

MR. SMITH: I won't ask the question. It seems to me if he was right the first time the answer is so obvious. I will withdraw the question.

20 Q. Now I want you to assume first that I have a tunnel with an arch to it. Is it necessary that that roof should be broken down if there is subsidence about it? A. No, I do not think so.

Q. In other words, what happens to it? A. There is a gradual settlement and shrinkage of the ground and whether there would be dislocation or not would depend on the weight that accumulates on that roof.

Q. In other words, there may be contraction of that area? A. And there may be settlement.

Q. Have you a knowledge of mining? A. Yes, sir.

Q. Have you a knowledge of rock tunnels in mining? A. Yes, sir.

30 Q. Is it necessary to support a rock tunnel in a mine, as a rule?
A. As a rule, yes.

Q. Which is done by timbering? A. Yes, sir, in many cases.

Q. And why do they timber? A. To hold the roof.

Q. And do these timbers break in mines? A. Yes, sir.

Q. And do timbers break in mines without any of the rock or roof falling off? A. Without any apparent movement of the rock.

Q. I said falling off. Well I won't tell you what I mean? A. The ground sometimes accumulates on the timber in such a way as to cause the timber to break.

40 Q. But take a rock tunnel. Take this whole mining area down in the Crow's Nest Pass.

MR. WOODS: I am objecting. The conditions of mining either in the Crow's Nest Pass or any other places that I am familiar with in Al-

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57

Alan
Emerson
Cameron,
Examina-
tion.

continued.

berta have not any bearing upon any opinion that any witness could give on that subject which would be applicable.

THE COURT: I think you should at least get from the witness an answer as to whether such a comparison would be of any assistance in support or otherwise of his opinion about the conditions here. When you have done that then the next question is as to whether or not the similarities are not so great that the whole weight of the evidence might be gone. Then, thirdly, the other and the main difficulty as to whether or not the evidence is itself admissible.

MR. SMITH: I was confining myself to a much narrower area than anybody thinks I am, but I am not allowed to lead or tell you what I have in mind. 10

THE COURT: Well I think you had better take a step at a time.

MR. SMITH: I do not want all these things your Lordship has suggested. I do not intend to go that far.

THE COURT: And then there is a fourth thing—the discretion—the trial judge limiting the scope of anything which may be of little importance or rather of little value.

MR. SMITH: I think it is of value and if I was permitted to tell you I could in a moment. 20

THE COURT: I think you are. I think Mr. Woods would probably agree as far as this witness is concerned that anything you might tell me would not give this witness a false memory or suggest the giving of a false or dishonest opinion.

MR. WOODS: That is quite true. But I do want to point out this. My friend and myself have had a considerable amount of experience with regard to mining cases both in the Crow's Nest Pass and here. Why this opens a tremendous subject, why you should support the roof of a rock tunnel. I remember now examining a person a long while myself on that subject and it is going rather far afield it seems to me and if the purpose of this question is connected to make it analagous to this I object—and why some rock tunnels have to be timbered—I suggest we are opening a subject that should not be opened. 30

THE COURT: I understand you do not object to Mr. Smith telling me his reasons now?

MR. SMITH: I have been examining on the question of contraction in the tunnel without displacement of the roof. In other words, you may have a moment in earth which will contract that void without a physical displacement. That is what I had in mind and I thought that if rock tunnels did that very thing then, a fortiori it would be of assistance in material such as we have here. 40

MR. WOODS: To my knowledge of the matter the movement of rock is so minute that it would not be of any real value at all.

MR. SMITH: It would be a support. What do you mean?

MR. WOODS: Well some of them have to have supports. But I object to the evidence because it is opening a subject which should not be opened here.

MR. SMITH: I am in your Lordship's hands.

THE COURT: Oh I think if there is any discretion about it I should stop you here. Whether or not there is any discretion about it I think
10 that the evidence would not be of any real value in the present case—perhaps a layman's suggestion that experts might not think of any value.

MR. SMITH: Well being a layman I tried to put myself in your Lordship's place.

THE COURT: I think that is a very wise position for counsel to take.

MR. SMITH: Then we will leave that alone.

CROSS-EXAMINATION BY MR. WOODS

Q. To shorten the matter up, I think we may agree you came to your opinion as you have given it to the Court in the same way that
20 Dean Wilson came to his opinion in connection with this matter, that the settlement must have been the cause of the break. I am referring to the way in which he came to his opinion and which I think you have described as being a process of elimination. You took all the circumstances that you could figure to which that pipe was subject; you estimated them together; you knew what the breaking strength of the weld metal was and you found that the stresses as so computed by you, some of which were approximated and some of which were actual, were not as great as the stresses that you assumed the weld metal could stand by reason of these experiments you have done on the other two welds. And finding
30 that condition of affairs you conclude that the construction of the 1931 tile sewer must have allowed the ground above to settle inducing the further stress that was necessary to break the pipe. That is the way you came to your conclusion? A. That is substantially it, yes. With the exception that we did not estimate our stress except in so far as we transferred experimental results obtained in the laboratory to the case in hand. We determined stresses for each of those conditions and then transferred them to the case in hand. Now we had experimental basis for our calculations.

Q. Now I will come in a moment to what I understand some of the
40 important estimated amounts are from my standpoint. But in the mean-

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 57

Alan
Emerson
Cameron,
Examina-
tion.

continued.

Cross-Ex-
amination

*In the
Supreme
Court of
Alberta*
—
Defendant's
Evidence
—
No. 57
Alan
Emerson
Cameron,
Cross-Ex-
amination
continued.

time I want to get the general layout. That is, where you came to your conclusions. It was not by observation of any actual settlement anywhere in the ground between the gas trench and the 1931 construction? A. The only street observation I have of that is the apparent displacement of the catch basin drain.

Q. As expressed by you here which was a flashlight taken by you?
A. Not a flashlight picture.

Q. But you were going up the manhole and passing this drain. That is about six inches? A. Six and one-half inches in diameter.

Q. And you did have a flashlight? A. I had an electric light in my hand. 10

Q. And you put that electric light in and around that six or seven inch catch basin and saw that the course of the actual pipe itself was not completely straight—that it went in a curve to the north to the extent of some feet mentioned by you. I did not gather from you that you could really pledge your oath to the fact that that, that you observed—any view of the— A. Well I certainly deduced from the top of the catch basin pipe that there had been movement of the ground in the vicinity of that point six to ten feet from the drain sufficient to displace that catch basin drain. 20

Q. That was a deduction you made from the fact that the catch basin drain was out of line? A. Yes, it was out of line.

Q. But there is nothing that you saw, from which you give evidence, that there was subsidence. You did not yourself see any subsidence in the ground? A. I took that to be evidence of subsidence.

Q. I am more particularly referring to the ground between the gas main down to the 1931 construction of the City. You saw no subsidence of that ground? A. There is no way by which one could see subsidence except on that catch basin drain—the possible movement of that catch basin drain. 30

Q. Well of course Mr. Haddow and Mr. Ruff saw it through the aperture? A. Well I was not there at that examination.

Q. MR. WOODS: Your method of arriving at your opinion, which opinion you have given to the Court, is the same method as described by Dr. Wilson and which I have in effect described to you here. That is, the adding up of certain stresses and finding them did not account for the complete stress you experimentally got on the welding material, and then saying you must have some other stress. There is no other stress we know of except the stress coming from subsidence, and therefore there must be subsidence? A. No. I said to myself and to my colleagues that the pipe is bent down, there is a cavity above or beside the weir chamber, there is a cavity between the weir chamber and the sheathing — between the manhole wall and the sheathing, and there is this evidence in the catch basin drain. Now the accumulation of these facts together with the fact that without some additional stress 40

beyond those which can be calculated on the basis of experiments there was not sufficient stress to break that pipe without this additional matter, and the evidence of that additional matter is present at those points.

Q. Because you saw the hole you have described at the weir chamber and because of the fact that evidence has been given here of a hole such as described between manhole "A" and the sheathing and because of what you saw with your electric light through the six or seven-inch catch basin drain. I have covered them all now? A. Well that is four fairly definite points.

10 Q. Any other? A. There was evidence supplied to me by Mr. Farquhar of additional points—the fact that the pipe was down, one; the fact that Farquhar found a cavity, two; the fact that the catch basin had apparently moved, three; the fact that there was a cavity on the north wall of the weir chamber, four; and the fact that there was a cavity between the sheathing and the manhole wall was five; which all seemed to me to point to direct evidence of subsidence.

Q. And that is all? A. Yes.

20 Q. And if in fact—assuming for the purpose of my question it is a fact—that the ground above the weir chamber, the ground that is outside that sheathing (Exhibit 41) had not according to the observation of reliable people settled at all, if that is a fact, and assuming it to be a fact, would you agree with Dr. Wilson that that being taken to be a fact it is quite clear that the theory that you have advanced of settlement cannot be supported? A. Yes, sir, on the assumption that is correct.

30 Q. And I think I am right in my memory of the evidence. When Mr. Haddow states that the ground outside that sheathing according to his observation which he went down there to make for that purpose, opened that hole for the purpose, that the ground was in a virgin state and had not settled at all—if that is right, if Mr. Ruff's evidence is right, when he states that when he observed the hole at the weir chamber, also—I am including Mr. Ruff now; but assuming that what Mr. Haddow states is true.

THE COURT: Just there, it is not a question of the truth of it. It might be true. My difficulty about this part of the evidence is what Dr. Wilson has said and what I have understood this witness to have said, that there are certain things which caused a settlement, one of them being shrinkage. I mean it is not a question of credibility. You are quite right in your cross-examination, but you understand what I mean?

MR. WOODS: Yes. There must be a settlement of that ground.

40 THE COURT: The only point I am making, I think you had better ask him to assume a certain physical fact rather than the truth of the statement of a witness.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57

Alan
Emerson
Cameron,
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*
—
Defendant's
Evidence

No. 57
Alan
Emerson
Cameron,
Cross-Ex-
amination
continued.

MR. SMITH: I think counsel and Mr. Wilson may have been at cross purposes. You say "assume there is solid ground over the weir chamber." We know there was not solid ground over the weir chamber but was in fact a cavity between the sheathing and the manhole. Does my friend assume that cavity was not there?

MR. WOODS: I am not going to answer my friend and it is perfectly clear what Dr. Cameron means and what Mr. Wilson means and we are not speaking of the ground over the weir chamber between the sheathing of manhole "A" and manhole "B." Both witnesses understood and Dr. Wilson understood perfectly well that what I was referring to—if 10
the fact is that the ground outside that sheathing right down to the manhole is undisturbed—has not settled—

THE COURT: Now this just gets down to the propriety of what I have just said, and I think you had better ask him to assume a certain physical fact. I do not mind saying now that I have taken a certain meaning from what Dr. Wilson has said and from what Dr. Cameron has already said but I will not express it yet. Your cross-examination is perfectly proper and unobjectionable but I am suggesting that perhaps the better way to put it to avoid any difficulty is to ask him to assume a certain fact. 20

MR. WOODS: Assume the fact of that ground being undisturbed and unsettled—that there is no settlement in that ground, that any human being can observe. Then in that case I take it from what Dr. Wilson said and I take it from what you said a moment ago, then, you cannot account for how the pipe broke. You do not know. You cannot suggest? A. On that assumption the pipe would not have been found broken, in my opinion.

Q. That comes to the same thing. It certainly was found broken. We know that. And, as Dr. Wilson expressed it to me, "Then that being so and on the assumption you asked me to make then I cannot explain 30
any reason whatever why it broke." That is what he said. A. That is right sir, yes.

Q. Am I right in stating to you—this is going west (Exhibit 74). And that depression in the pavement as shown on Exhibit 74 runs westward from there? A. Not to my knowledge. I don't know how far it went. I am simply taking those pictures as evidence of a ground movement at that point.

Q. Well do you know or can you tell me whether that depression is over the gas main? A. I would say it is fairly well over the gas main, yes, except that it extends beyond it here—appreciably here. That is the 40
left of the picture (Exhibit 74) where it gradually tapers out.

Q. And ceases to be a depression? A. Yes.

Q. But otherwise the main depression is over the gas main? A. Yes, sir. The main depression is close to the manhole.

Q. Immediately over the gas main there is the break? A. Yes.

Q. And similarly on Exhibit 75 the depression is over the gas main?
A. Yes, and the space is appreciably shorter.

Q. So really what happened there as far as that depression in the pavement goes it is a depression in the pavement running from the east to the west getting bigger as it goes west? A. Swinging out in this direction around from the manhole on both sides of the manhole presumably. We have only two points. It would be roughly only a heart shaped depression if it could be surveyed.

10 Q. The depression runs along the gas main? A. The depressed part of it lies along there.

Q. And if the result of there being a ground settlement at that point which let the gas main down and let the pavement down as shown in those photographs and if in fact Dr. Wilson's theory as expressed here is right, that when ground of this kind settles down it does not go down vertically but it fans out, as he puts it, so that as he expressed it his theory is that from the catch basin up to the surface it would fan out somewhere from twenty to forty feet? A. Yes, sir.

MR. SMITH: The weir chamber. You said catch basin.

20 Q. MR. WOODS: The weir chamber. Can you explain to me why it is that that depression over the gas main did not fan out? A. I believe it did,

Q. Did you observe it? A. Some evidence of it on these pictures.

Q. The pavement? A. Not a detailed contour.

Q. I understood from what Mr. Smith asked you— A. Not in sufficient detail to show that. That is all a matter of seven feet there.

Q. Were you speaking only from the picture? A. I am simply using those pictures as evidence put in to show subsidence.

30 Q. But you are not speaking of an observed depression in the pavement itself, by yourself? A. Not by myself, no.

Q. You are speaking entirely from Exhibits 74 and 75, A. Yes.

THE COURT: That is what I understood you to say.

MR. WOODS: Assume that the depression actually on the pavement runs over the gas main and does not spread out to any appreciable extent on either side of it. Is that consistent with Dr. Wilson's theory of fanning out as he has mentioned? A. I do not quite get the question.

40 Q. Dr. Wilson's theory of the way the ground in the neighborhood subsides is it does not run down vertically and leave the same space at the surface depressed, as at the bottom depressed, but whatever causes the subsidence, take it to be a cavity as big as Exhibit 17 which you say, and quite rightly, would have a tendency to make the ground above it go down and fill up that cavity. But Dr. Wilson's theory is that the cavity

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57

Alan
Emerson
Cameron,
Cross-Ex-
amination
continued.

that you found up above is not only a cavity that big but that the ground as it subsides takes a form which he describes as an angle of forty-five degrees. So that when it gets to the surface instead of being only two feet wide it may be forty feet wide? A. Yes, sir.

Q. Now if in fact the pavement at 107th Street sank as shown in these photographs 74 and 75 and if in fact that pavement, as so sunk on 107th Street, is a depression over the gas main and that the depression in the pavement does not extend substantially outside the area above the gas main, then would you agree with me that Dr. Wilson's theory, which I have called his fanning out theory, is not consistent with that pheno- 10
mena, always assuming that the settlement of the pavement has been caused by the gas mains due to subsidence? A. It seems to me there are two points in that question. I would have to answer each separately.

Q. I do not want to put a question that you do not understand. But I am more particularly concerned that the Court understands it. It is a long and involved thing and I had to explain it by reference to the witness.

THE COURT: I think from the witness's answer to you you have to separate both portions and perhaps we had better let him do it this afternoon. 20

At 12:35 Court adjourns till 2:00 p.m.

At 2:00 p.m. Court resumes.

Q. MR. WOODS: Let me see if we can get at this matter I was dealing with this forenoon, in another way. A. Yes, sir.

Q. Take this little sketch and assume for the purposes of the few questions I am going to ask, that is the pipe in the trench and that is backfill above the gas pipe and there is the pavement? A. Yes, sir.

Q. Now suppose that backfill shrunk—fell away? A. Yes, sir.

Q. Would that account for the movement of the pavement? A. It might account for the movement of the pavement if the span were large 30
enough to allow the pavement to sag.

Q. I do not mean to ask you whether this is the condition there but that might be the condition there (referring to Exhibit 74?) A. I cannot accept that because of the fact that this spreads out to a point so far away from the obvious end of the trench.

Q. And I am asking you as to whether, both 74 and 75, it might possibly be accounted for by reason of the shrinkage or the falling away of the backfilling above the gas pipe? A. Seventy-five could be accounted for in that way in part also except for the dragging out of the sag.

Q. Do I understand your answer to be that the picture shown on 40
Exhibit 74 could not possibly be accounted for by the circumstances I

have mentioned? A. In my opinion it could not be entirely accounted for—the condition shown in 74 could not be entirely accounted for due to the subsidence of the trench alone.

*In the
Supreme
Court of
Alberta*

Sketch showing pavement and backfill over pipe, marked Exhibit 87.

Defendant's
Evidence

Q. Dealing with this matter of the shrinkage which was mentioned by you in chief and also by Dr. Wilson.

No. 57
Alan
Emerson
Cameron,
Cross-Ex-
amination
continued.

MR. SMITH: I wonder if it would not be a good idea for us both to admit the dates of the photographs. Mr. Morrison tells me it was May 12th, 1932.

10 MR. WOODS: Yes.

Q. The shrinkage you spoke of is the result of the moisture content of the earth being removed, the draining off of the water into intervening soil? A. It is that and the removal of support of the ground above.

Q. Well dealing with the matter of drainage. Looking at this model. Do you observe that in 1907 there was the sewer built and the manhole built, the manhole "A?" A. I will assume that.

Q. And that is the sewer that goes right up the lane? A. Yes.

20 Q. A twelve-inch sewer I think. Now that is as low as any other part of the model? A. Yes.

Q. And you observe also these catch basins? A. Yes. This is the sewer down 107th Street.

Q. And we have the sewer down the lane in 1907. And the next above it is the sewer down 107th Street, the date of its construction is 1907 and it is so indicated on the exhibits. And the date of the construction of that six or seven-inch line to the catch basin on the east, and in 1913 these other pipe lines are built, six or seven inches each—three of them at the time of the pavement in 1931. Now would these constructions drain the area? A. Yes, sir.

30 Q. And you see 1907, the construction alone is as low as any other part of the plant? A. Yes, sir.

Q. And it has been draining that area ever since 1907? A. They would establish a definite—a fairly definite moisture equilibrium, hydrostatic equilibrium, in the vicinity of the crossing.

Q. Would you agree with me that that area, that intersection, with these constructions built at the time that they were would now be found to be a pretty dry area as far as—A. They would have established a hydrostatic equilibrium.

40 Q. You said that a moment ago. A. That is the answer. They would establish a definite water content which would be stable some time after 1907 but by a period of about seven or eight years things should have come to an approximate equilibrium. They were relatively suitable for those conditions.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57
Alan
Emerson
Cameron,
Cross-Ex-
amination
continued.

Q. But would you say it would be a dry area? A. Well it would be drier than the surrounding soil, yes, sir.

Q. And the fact of these constructions underneath the gas main would be to have, according to you, as I gather, drainage caused by them would have the effect to some extent of letting down the soil under the gas pipe. Is that right? A. No, sir. The gas pipe would be put in open soil which has reached a relatively suitable condition due to that previous drainage effect.

Q. Supposing we never had any fifteen-inch tile sewer, would there have been any further drainage from these under constructions? A. My opinion is there would have been no relative change. They had already their effect. 10

Q. And there would not be any further shrinkage of the ground as the result of any drainage being taken away from the intervening ground by these city constructions other than the 1931? A. I don't know that I follow you.

Q. I am asking you to assume that the 1931 construction had never taken place? A. Yes, sir.

Q. Would there be any shrinkage of the ground at all under the gas main and the result of the other city constructions that were there from 1923 on? A. Relatively, no. They would have established themselves to a stage of equilibrium. 20

Q. I know that is very wise, and is no doubt intended to make a poor ignoramus like me gasp. But I want an answer to my question. I want to know whether that ground if there had never been any 1931 construction, would it have shrunk at all as the result of the shrinkage of the ground due to drainage by reason of other constructions between 1923 and 1932? A. I believe there would be extremely little if any further change in that ground due to the 1907 constructions.

Q. Will you say whether you would think there would be any at all? A. There may be a trifling amount. 30

Q. So if there had been no 1931 construction at all there might be some shrinkage of the ground due to the other city constructions? A. There might be.

Q. Can you tell me what shrinkage of the ground you estimate as the result of the 1931 construction? A. No, I can make no estimate.

Q. Can you give me an idea? A. No, no estimate.

Q. You cannot tell me whether it is half an inch or quarter of an inch or three feet or anything? A. No.

Q. It may be only a quarter of an inch? A. It might be. 40

Q. Now if there was drainage due to the fifteen-inch sewer, such as you suggested, where did the water drain? A. It drained along the sewer around the outside of the sewer and out presumably along the outside of the larger storm sewer that came north down 107th Street.

Q. What do you say? Would drain on the outside of that tile sewer? A. Yes.

Q. And just dropping towards the northeast. Where would it go?
 A. It would move around following the contact between the solid material and the earth and find its way as this sewer extends down grade to some blocks north.

Q. And you are estimating this shrinkage due to drainage, but you did not give the Court any idea whether it would be one-sixteenth of an inch or a foot—what the amount of that shrinkage would be? That is right? A. You are referring to the shrinkage prior to the installation or subsequent to the installation of that sewer?

10 Q. I am speaking of the shrinkage due to the 1931 construction.

A. The total shrinkage there is extremely difficult—

Q. I am asking you whether you would estimate the shrinkage due to the 1931 construction as much as one-sixteenth of an inch? A. Oh yes I think more than that.

Q. One-eighth of an inch? A. Yes, more than that.

Q. One-quarter of an inch? A. Yes, probably more than that.

Q. Three-eighths of an inch? A. I don't know how much further I can go. It will vary from place to place throughout the comb.

20 Q. You would not be not merely not sure, but you would like to say it is probably as much as three-eighths of an inch? A. Oh I think it is possibly more than three-eighths of an inch.

Q. I say probably? A. Yes, probably more than that.

Q. And can you get up to an inch? A. I think it is probably as much as an inch.

Q. Is it probably as much as an inch and a quarter? A. I might go up to an inch and a quarter.

30 Q. Is it probably as much as an inch and a quarter? Because I am going to take you up to three feet if you are going on. A. I would say that the settlement of that ground due to the removal of support may appear on the surface at a maximum point that would not exceed six inches.

Q. Do not get away from my question. I am asking you whether you would probably say—would you say probably in your experience and knowledge as an engineer that that settlement due to shrinkage of that ground as the result of the 1931 construction was probably as much as an inch and a quarter? A. Due to the shrinkage of the ground it may be as much as an inch and a quarter.

Q. And that is as far as you would like to go? A. No, I do not know how much further I would go.

40 Q. And what would be the shrinkage of the ground due to the 1907 city construction? A. We have no way of attempting any figuring on that because subsequent to the figuring of the 1907 construction there was a considerable re-adjustment of the surface in the vicinity of 107th Street preparatory to the paving of the street.

Q. But you have no doubt it would be greater than any settlement that has occurred since? A. Well without the evidence of levels taken

*In the
 Supreme
 Court of
 Alberta*

—
 Defendant's
 Evidence

—
 No. 57

Alan
 Emerson
 Cameron,
 Cross-Ex-
 amination
continued.

on permanent bench marks that have existed throughout that time I can give you no estimate of the distance.

Q. And you have not any idea at all? A. I have no fixed idea. It will vary from place to place.

Q. Have you an unfixed idea? A. Yes, from place to place which may vary due to water conditions and channels.

Q. Well give me an idea how much the shrinkage of that soil was, if you have any idea? A. The moisture content of the average soils varies anywhere from ten to twenty per cent. Around the country side the average moisture content in these soils as a result of that construction 10 might vary anywhere from ten to fifteen per cent. There would be an over-lap. I cannot think of any way in which we can estimate the amount of shrinkage due to those latter constructions.

Q. So that your first answer was right. You do not know and you have not really any idea how much shrinkage there was as a result of the first constructions? A. That is probably correct. I have no definite knowledge; certainly not.

Q. We have heard a good deal here about stress concentration? A. Yes.

Q. You have heard about it? A. Yes, I have heard something 20 about it.

Q. Now that book of Coker and Filon, a treatise on photo elasticity. Is that an authoritative publication? A. I would consider it is a very authoritative book on that subject, yes.

Q. Now I want to take you over a part of that and see whether I can get a definite idea of what this matter of stress concentration means. And I am now referring to page 597 of the book where there are some diagrams. You have seen this before? A. Yes.

Q. Now then the first diagram "A" is a diagram showing a notch or fissure, or I think you referred to it as a notch, this morning? A. Yes. 30

Q. In a weld? A. Not necessarily there—no, Mr. Woods, that has to do with a notch in tests for impact. It is not a weld notch.

Q. It might be either in the weld or in the material itself. The object of the thing is to estimate or give an idea of how this matter, this element of stress concentration increases with the sharpness of the notch. That is the purpose of it? A. Yes.

Q. There is a sentence, and I want to see what you say about it. Page 596: "If, however, the radius of the notch is decreased one-sixteenth "cm. the maximum stress rises to nearly six times the mean stress as "figure 7.101c shows, while if the radius is very large, say ten mm. the 40 "maximum stress is approximate 2.2 times the mean." A. What particular type of stress is that? I have not any doubt that from the viewpoint of the experiment and the work that has been done here those figures would hold as a result of their observations. I have not any doubt of that at all.

Q. It has been explained here by Professor Morrison, it is apparently a highly technical subject, but his evidence is, if you take a notch in a

piece of steel such as is shown on any of these photographs, Exhibit 46, the sharper the end of the fissure or crack—you called it a crack this morning, the greater the chance of the breakage of the metal under strain? A. The breakage of the metal will occur when the metal is stressed to its breaking point. There will be a stress concentration at the end of that notch.

Q. And the sharper the end of the notch or the smaller the crack—the end of that crack—that piece of steel or that piece of weld will break at a less of a pull weight than if you had a notch that was not as sharp? 10 Isn't that right? A. The way I would put it would be that the sharper the notch the sooner will the breaking strength of the metal be reached due to the stress concentration.

Q. I think that is another way of saying what I mean, probably a much better way. But what this means is that if the radius of the notch is decreased, that is if it is sharpened, then the maximum stress rises as the radius of the notch is sharpened? A. Yes, it will rise up to the breaking point of the material.

Q. And it may rise to six times what its mean stress is. It may be six times as much? A. No, I cannot agree with you there.

20 Q. Do you agree with these gentlemen here? A. No, not with that interpretation. The effect of stress concentration due to the notch will be to raise any applied stress to the breaking point of the material, but it cannot go beyond that because once beyond that, it is broken.

Q. Of course it would not raise it past the breaking point but it might raise it up to six times what ordinarily it would be. A. Not what ordinarily it would break at, no.

Q. Suppose you got a piece of metal and you got a notch in it. Now that notch, we will say, reduces the strength or the tensile strength of that piece of metal by, let us say, five thousand pounds to the square inch?

30 A. That is to say that the piece of metal—

Q. Will break at a pull of five thousand pounds to the square inch?

A. The piece of metal will break at the breaking strength of the metal.

Q. I want to get at this in this way. Suppose that that breaking strength is five thousand pounds less per square inch by reason of a notch?

A. Well I am sorry, but the breaking strength of the metal, independent of its cross section area, will be the same whether it is in front of the notch or beyond the notch. It is going to break at that stress.

Q. If you had a bar without a notch, we will say that the breaking stress of that piece of metal is sixty-seven thousand pounds? A. Yes, sir.

40 Q. And then you have a notch in it. And it would only require, let us say, fifty-seven thousand pounds to break it. Supposing that to be the case? A. Well I am afraid I cannot see the physical possibility of it. The metal is sixty-seven thousand pounds per square inch tensile strength.

Q. And you have to put a certain amount of weight on that bar to break it? A. Yes, if it has not a notch in it.

Q. Now if it has a notch in it you have to put less there? A. Yes.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57
Alan
Emerson
Cameron,
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57
Alan
Emerson
Cameron,
Cross-Ex-
amination
continued.

Q. And if the apex of the bar—as that gets narrower and narrower you have to put less and less strength on that bar to break it? A. Less and less load on the bar—yes, Mr. Woods.

Q. But you examined this particular piece of welding that broke, under the microscope? A. Yes.

Q. And did you find a crack in it? A. No, I did not find a crack in the metal that I would say was a crack in it.

Q. Did you find a notch in it? A. Yes, there is a notch or at least a space that would act as a notch.

Q. Can you estimate at all what effect that particular notch had on this particular welded material as a matter of breaking strength? A. I think the notch would have no effect on the strength per square inch of the welded metal. 10

Q. Well, don't try to confuse me because I do not happen to be a professor in Geology. A. No I am not trying to.

Q. We have a force going each way? A. Yes.

Q. And that force would be less because there is a notch? A. The notch increases the force at the apex of the notch.

Q. So you do not have to put as much stress or weight on that weld to break it with the notch as without it? A. I am trying to think to clear up my conception of that. I do not think I can do better than to take Mr. Ewertz' example. When he packed the notch he got the strength of the weld metal as against the strength of the pipe metal. Now that strength showed, was a weld metal strength of thirty-nine thousand pounds per square inch when there was a load of twenty-nine thousand pounds on the pipe metal. 20

Q. You are really trying to answer me, are you? A. Yes, sir.

Q. Then I have not made myself plain. I am not speaking at all, and I have not any reference to this new theory of Mr. Ewertz that you never heard before, as you told us. I am speaking of the fact that if you have a bar of metal and you have to put a certain weight on each end of that bar to break it, I understand from your previous answers that when you had a notch in that bar of metal you had to put less weight on each end of that bar of metal to break it? A. Oh yes, absolutely. 30

Q. And I am asking you whether you can estimate in the case of this particular break and that particular notch that you observed in this particular weld that broke, can you estimate how much less weight you would have to put on that bar of metal to break it or on that weld to break it than if it did not have the notch that it has? Have I made myself clear? A. I think so—if I can make myself clear. And my answer to that is, in order to break the weld there had to be a stress of thirty-nine thousand one hundred pounds per square inch in the pipe metal. That reference to the thirty-nine thousand one hundred gives us our multiplying figure of 1.34 or 1.35. 40

Q. Now at this figure of thirty-nine thousand pounds, he arrived at that by reference to testing the other welds altogether that had different

forms of notches? A. Yes, but showing the same types of construction.

Q. But the notch is not the same notch as here? A. Well you cannot get the same notch again.

Q. And I am directing my remarks to this particular weld and not to the others. A. Yes, Mr. Woods.

Q. And I do not want you to take me off the track by referring me to other welds or thirty-nine thousand pounds which is a figure got from the other two welds. And I will ask you to answer my question if you can, as I put it.

10 MR. SMITH: If that is possible.

(Question read). And I am asking you whether you can estimate in the case of this particular break and that particular notch that you observed in this particular weld that broke, can you estimate how much less weight you would have to put on that bar of metal to break it or on that weld to break it than if it did not have the notch that it has? Have I made myself clear? A. Well, my answer to that, I think, is my estimate would be that it would take a stress of forty thousand pounds per square inch to break the weld if there were no notch, in place of twenty-nine thousand pounds per square inch in the pipe metal. Actual
20 experiment has shown that to be approximately thirty-nine thousand.

Q. Actual experiment on other notches? A. Oh, absolutely, sir, I grant you that.

Q. And the notch at this particular weld may be much sharper than at the other welds, may it not? A. Yes, it may have been sharper.

Q. And the sharper it is at the end, the less force it takes to break the pieces of metal? A. It is going to take somewhere around forty thousand pounds per square inch to break that weld metal.

Q. The sharper it is at the end, the less force it takes to break the weld? A. The sooner the stress concentration will arrive to the breaking
30 strength of the metal—yes.

Q. And that being so, have you any way whatever of estimating what the breaking strength of this particular weld is, when the conditions are not the same as to notch and as to crack and as they were in the two welds you tested for the purpose of getting your initial figure upon which you based all your calculations? A. My estimate would be — the only other assumption I can use is the breaking strength of the weld metal which one can put at approximately forty thousand to forty-five thousand pounds per square inch and the stress concentration to produce that stress in the weld metal was produced when the pipe metal was at a
40 stress of twenty-nine thousand pounds per square inch. Now the first calculation on that basis would be forty divided by twenty-nine which is of the order of 1.35 which closely approximates Mr. Ewertz' figures.

Q. So this elaborate theory of yours and Dr. Wilson's is dependent upon the validity of the experiments you made on the other two welds in respect of the breaking strength— the whole theory. A. The theory—

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 57
Alan
Emerson
Cameron,
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 57
Alan
Emerson
Cameron,
Cross-Ex-
amination
continued.

I have attempted to show that the only way we can arrive at the strength of that actual weld is to compare it by all physical and microscopical means at our command with the fractures in the test coupons from the welds on either side.

Q. And that being so, and assuming for the purpose of this question of mine that the notch at this particular weld that broke was an essentially different notch with an essentially different crack and the end of the crack being essentially sharper and different from the two welds that you took your figure from, then your comparison does not hold at all, does it? If the notches are different the comparison does not hold? A. My 10 observation was that the notches were very nearly alike. If you postulate they are different I will certainly admit that the stress concentration would be different.

Q. And if the stress concentration is different, then you arrive at a different figure for the purpose of ascertaining what the breaking strength of the pipe at that point was. A. Oh we have no way of determining that. If we cannot use the figures from the adjacent welds, we have absolutely no way of saying what the stress was on that weld.

Q. And you have come to this conclusion of yours on which you are seeking to put the responsibility for the breaking of the gas company's 20 main on the under construction of the City of Edmonton made in 1931—you came to that conclusion and that whole argument upon the basis of an assumed figure which may be quite wrong. A. Oh it cannot be quite wrong, Mr. Woods.

Q. If the notches are different and if the crack in the notches are different, the figure would be a different figure. Am I right? A. If the crack is different it would be a different figure.

Q. If the figure is different, if the essential figure is a different figure, then all the argument that you have based on that figure goes by the board? A. Oh absolutely, yes. 30

Q. And this whole argument being based upon the fact that you have taken certain stresses that you find in that pipe and finding that they are not as great as this figure which you found, by the comparison of the other two welds or the testing of the other two welds, and that therefore the city's construction is responsible for it—that whole argument falls? A. We have no way by which we can get the actual value of that weld.

Q. I gather you told my friend that this theory or statement of Mr. Ewertz about the fact that there is a difference now in the specifications for the pipe metal—the welding of pipe material even in a structural steel 40 material, that was all news to you? A. Oh no.

Q. Had you heard it? A. I knew that codes for pipe are not necessarily codes for structural design.

THE COURT: I did not understand he said that was new to him.

Q. MR. WOODS: The new method of testing coupons? A. Oh yes. That, to my mind, is a new method and a desirable method.

Q. And he is taking into account the fact that you are testing the coupons in a curved form? A. You are testing a section of what ought to be the whole round form and you have to make allowance for a balancing effect.

Q. And do you agree with Mr. Morrison that if you test the weld in the whole round form and the pipe coupling, that you would get the same relative difference between them as to percentages that you do now
10 when you tested them in the flat form? A. I would say you are getting the relationship between the strength of the weld metal in the cast form as beaded around the weld, and the strength of the weld metal. That is two entirely different things. Weld metal is forty thousand to forty-five thousand pounds per square inch and the other would be fifty-five thousand to sixty thousand, and that would give the ratio of the two tests. It would be a fair comparison.

Q. Would you test them both in the same way if you wanted to get the same results? A. Yes.

Q. If you tested the weld in its rounded form you would compare it
20 with the pipe metal in rounded form? A. Yes. The results of the coupon form test on the pipe metal and on the coupon form test on the weld metal would give the same figures per square inch.

Q. Mr. Ewertz' talk is about percentages. He got a figure of sixty-eight and one-half per cent. and he told me—he was comparing that when he took the test of the strength of the weld in its rounded form and made an allowance for it that the figure he was getting he tested with the figure you got when you tested a coupon and his figure was sixty-eight per cent. of yours? A. Yes.

Q. Is that a fair way of testing? A. Yes, because if you tested it
30 in the pipe form you would still get fifty-six thousand pounds per square inch.

Q. And you would get the pipe metal test at fifty-one per cent.? A. No.

Q. It is sixty-eight and one-half per cent., as I gathered from him, of the figure that you got when you tested your pipe metal in a coupon. A. Yes, Mr. Woods, surely. And the pipe metal tested in a coupon form or in a flat form was tested as a round bar or round pipe, with the same strength, fifty-six thousand to sixty thousand pounds per square inch.

Q. But the sixty-eight per cent. is sixty-eight per cent. of a figure
40 you got by testing it in a different way? A. No, you can test them in the same way.

Q. If you test them the other way you would get a different percentage? A. No, you would get the 68.5 per cent.

Q. Do you know whether there is a gas main on the east side of 107th Street running through that manhole "B"? A. No, not that I know of.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 57
Alan
Emerson
Cameron,
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57
Alan
Emerson
Cameron,
Cross-Ex-
amination
continued.

Q. You have not examined it to find out? A. No.

Q. And you did not produce your model by going into all the under services? A. No, we took the evidence from the City Engineer.

Q. I am informed there is a four inch gas main that runs through manhole "B". Do you know that? A. No, I do not know that.

Q. I take from your observation of these welds and from the evidence that we have here there was one welder on the job. It was the same welder that made the welds? A. I think it is entirely likely. I do not know.

Q. When you looked at that crack in this Exhibit 81 in this weld that broke, under the microscope, did you find that the crack was filled with slag? A. No, not that one. I called Mr. Morrison's attention to what looked like a slag crack adjacent to that but it turned out to be not a slag crack, Mr. Woods. 10

Q. Mr. Morrison instructs me that he took it to be slag up in the crack? A. Well, it looked like it but it turned out to be otherwise. It was nothing more than a hair that got in from the polishing cloth, and it was removed.

Q. Mr. Ewertz explained to me that when he tested that for the purpose of giving evidence and for his experimental design here, the little sketch he made to show the way the force went, that he put the testing clamps on about four or five inches from that? A. Yes. 20

Q. And pulled it? A. Yes.

Q. Would you say that when those clamps were as close as that, that the force exerted by the pull of the clamp would go in a direct line from clamp to clamp? A. It will go in a direct line except when it comes to this thickening and when it comes here it has to move around and that is why this opens when it is not strong enough to stay closed.

Q. But to get the effect he was talking of, of bending on it, you would have to have the force or he should have had his pulling force a good deal further away to make a proper experiment than four or five inches from the part he was dragging? A. I don't know how close he was to it. 30

Q. He said he was within four or five inches? A. That would give him presumably a long enough stretch.

Q. Well would it? A. Well we have five inches here or six inches on each side.

MR. SMITH: You mean on this specimen in front of you? A. Yes.

Q. MR. WOODS: That was not made for the purpose of an experiment for demonstrating a theory here. But should not Mr. Ewertz have had his clamps with the pull on considerably further from his weld than he had? A. Our tendency is to put a four inch gauge length. 40

Q. But that is not for the purpose of making— A. For making a standard test, eight-inch gauge length is standard.

Q. But for making a test of the thing he was demonstrating with his little model— A. You have to start somewhere.

Q. And should he not have had those clamps in the same position that he had the cord? A. I would say he would take the gauge length and make his specimen equivalent to standard gauge length.

Q. When you made your tests of the pipe metal in the coupons, did you put your backing on for the purpose of that test so as to make it comparable with the test that Mr. Ewertz gave here? A. No. We used the standard test for a flat piece.

10 Q. Your flat piece was not backed up? A. No, it was the standard accepted method.

Q. And the figure you took that way that Mr. Ewertz compared is the figure that he got by testing out by taking the test on his weld in a round piece? A. Yes.

Q. Do you think that is a fair way? A. Quite, Mr. Woods, yes.

Q. We have had Mr. Ruff make an examination of that basin since you made your statement this morning and his observation discloses that if there is any swing in it, it is a swing away from the fifteen inch tile sewer, not north to south. He has just made the observation since you
20 gave your evidence. Would you be sure? A. Oh yes. My recollection is quite clear that it is a double swing. It will go back at one place but it will come forward again at another. That was my clear recollection.

Q. Would you say that the swing you mentioned was to the north or to the south or both? A. Well, there is a slight drag of that catch basin to the north of one portion of it giving it a little loop to the north.

Q. And what about the swing to the south? A. Of course it swings to the south again after it gets to the apex.

Q. The principal swing you would notice would be to the south?
A. Well, not to me. It was to the north.

30 Q. It is suggested to me that this cavity you spoke of putting your arm through with the hammer at this point "Y" on Exhibit 39 might have come from the backfilling over the fifteen inch tile sewer dropping down as a result of the hammering of the brick wall that was built there. Would that occur to you as being a reasonable explanation? A. Well, the dropping down—it might very well be there without dropping down. All I say is that I felt up for some distance and could see along to the northeast for some distance a cavity.

Q. And it is suggested to me that that is explainable by reason of the falling down of the backfilling due to the building of the brick wall?

40 A. Oh yes. I cannot say how the cavity got there. If there was space here for that to fall into, certainly.

Q. And of course you are aware of the fact that when this ground, when there was any cavity formed in the course of earth settling in this soil it arches, doesn't it? The roof arches? A. Well, it may tend to arch for a while.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 57

Alan
Emerson
Cameron,
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57
Alan
Emerson
Cameron,
Cross-Ex-
amination
continued.

Q. And if an arch is over the cavity—assume for the purpose of my question that there is over this cavity an arch—if the roof has arched there would not be any settlement at all, would there? A. Oh yes there may be.

Q. Well, it would be infinitesimal? A. Oh no, the whole thing may come down.

Q. Well I gathered from what you say you cannot tell in any way whether this arch had? A. Oh absolutely not. There was a cavity there. That is all I saw.

Q. Do you remember seeing these pipes in the ground before they were taken up? A. Yes. 10

Q. And was there any bending of the intermediate pressure pipe, I mean bending laterally towards the ten inch one? A. The two were closer together at some spots than at others. Which pipe was crooked, it is hard to say.

Q. You did not tell? A. I did not attempt to tell.

Q. The figures given me are that at one part they were twelve inches apart and then they come seven and one-half inches apart and at this particular weld five and one-half inches apart and then six inches apart further on and then eight inches apart going west and thirteen inches apart—I gather across the street? A. Yes, there was a tendency for it to swing in at this point. The top of the pipe may very well have—waggled—is the best word I think of. 20

Q. And would you take it, could you tell whether that twelve inch pipe was relatively straight? A. Well one or the other. Both moved out a little bit.

Q. But the likelihood is that this intermediate pressure pipe that is bent throws the other at the weld— A. Well it may.

Q. The swing of the intermediate pressure pipe is more likely towards the low pressure pipe. Is not that what you would think? A. It is quite possible, yes, sir. 30

Q. Just look at your own model here. Can you give me an idea more definitely where that cavity you spoke of with reference to putting your arm in is with reference to the twelve inch main? A. It would be right here (indicating).

Q. Take it by reference to the break. We have the point of break there? (Indicating). A. Yes.

Q. In what direction is that cavity from the break? A. Well, it is hard—I would rather take that off the plan if I may. The cavity is three-quarters of a foot or half to three-quarters of a foot to the east and would be practically vertical below. It may be half a foot to the south—the centre of it. In other words, the cavity was somewhat to the south side of the tile overflow sewer, but extended to the left or to the north and it would be virtually directly below the welded joint and perhaps a half to three-quarters of a foot to the east of it. 40

RE-EXAMINATION BY MR. SMITH.

Q. When Mr. Woods was examining you, he asked you to assume that a person looking out through a hole in manhole "A" and above the weir chamber and seeing undisturbed soil. He asked you to assume that?
A. Yes.

Q. And he asked you that if that were so—if it were undisturbed, would your theory of subsidence fall? A. Yes, sir.

Q. Now is it possible for soil to move and still be in places in an undisturbed condition? A. I think so.

10 Q. And looking through this twelve-inch hole which they cut in, in your opinion would that be any sufficient observation to be of any real value in determining whether there had been ground subsidence or not?
A. I do not think it would be very reliable.

Q. There is no doubt that there had been subsidence between the manhole and the soil at which they were looking? A. There was subsidence directly above from the sheathing.

Q. They opened it and saw that cavity? A. Yes, sir.

20 Q. Now looking at this plan (Exhibit 41) again. I take it there is no doubt there was backfilling beside manhole "A?" A. There must have been.

Q. MR. WOODS: I do not know whether my friend could do this.

MR. SMITH: Questions were asked with respect to undisturbed soil.

THE COURT: Well you may go over it again and Mr. Woods may cross-examine if he wishes to.

MR. SMITH: What I have in my mind looking at manhole "A" and the weir chamber, that we have filled ground down beside the manhole chamber? A. Yes, sir.

Q. Filled ground over the weir chamber? A. Yes.

Q. And down to the fifteen-inch tile? A. Yes.

30 Q. In other words from the surface and following that line there is filled ground? A. Yes, sir.

Q. Now I am asking you to look at the photographs of these three welds, having regard to notches or the various other terms we have been using—tell me if in your opinion that the notch in Exhibit 84 is sharper than the other? A. As a notch I think it is sharper in 84 than it is in Exhibit 46 but it is no sharper than the notch in 45.

40 Q. And my friend put this question to you. He said that assuming the notch—assuming the figure that you found for the centre weld, that is the weld which failed by a comparison with the other welds, to be a wrong figure, all your reasoning fell to the ground? A. Yes, sir.

Q. Supposing you found a figure of thirty-nine thousand one hundred pounds and it in fact was thirty-nine thousand pounds? A. I do not follow you.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

—
No. 57

Alan
Emerson
Cameron,
Re-Exam-
ination

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57

Alan
Emerson
Cameron,
Re-Exam-
ination
continued.

Q. Supposing you found a failing strength of thirty-nine thousand one hundred pounds? A. Yes.

Q. And assuming that we knew positively that it was only thirty-nine thousand pounds would your reasoning then as to the cause of this thing fall to the ground? A. Oh no; one hundred pounds either way would not make any difference.

Q. In other words, you thought Dr. Wilson found stresses from all known things you could think of? A. Yes.

Q. And they totalled, he told us yesterday I think—do you remember the figure? A. Something of the order of nine thousand to ten 10 thousand pounds.

Q. Now this My Lord is something I completely forgot to ask Dr. Cameron about and I am asking Your Lordship's permission to do it. We had some evidence in that trench with respect to what has been described by Mr. Haddow first as ears and secondly as pressure ridges? A. Yes.

Q. Did you examine the ground under that pipe in June when it was lifted? A. Yes, I did.

Q. Did you see anything? A. Well I saw nothing that seemed to me to be unusual from the viewpoint of the lifting of the pipe. 20

Q. I suppose if you lifted this pipe or wiggled it you would have some little more on the side? A. There is bound to be a movement of the adjacent soil.

Q. Now I did not ask you as a metallurgist have you knowledge of the action of frost on metals? A. Yes.

Q. I did not ask you with respect to what has come to be known as frost jacking action? A. No, you did not.

Q. You heard me examine Dean Wilson with respect to that yesterday? A. Yes.

Q. What in your view is the action of our ground with respect to this frost jacking action? A. In my own words as I see it there may be some jacking action for the first year but once that has been accomplished and the ground has been compacted by that load there is no more possible effect. In other words you have used up the full length of your jack or screw in the first two years and I cannot see where it can be carried on indefinitely. 30

Q. What do you jack against? If you are going to jack downwards what is going to give you the other end? A. The strength of the pavement, if it is there, and of the bridge of frozen ground which Dean Wilson has mentioned has got to be stronger than the ground into which 40 you are doing your jacking and that to me is a physical impossibility because you are soon going to compact the ground down into itself harder than anything that is up above it.

Q. In the photograph of the last weld. You see the "V" in there? A. Yes.

Q. And I think you showed His Lordship in your examination-in-chief the piece of metal itself. I was only concerned with whether or not the small crack which was being showed you had been cleared up in Your Lordship's mind as to how it got there?

THE COURT: I know what Dr. Cameron said about it. I think I remember. But let him repeat it.

MR. SMITH: Tell us. A. The presence of this crack on 68 from the apex of the "V" in towards the weld metal appears to me to be due, that is the presence of this crack or fissure, due to the bending action imposed
10 on that piece of the weld during the processes of its removal from the trench and its cutting out and transportation to the University authorities.

Q. In other words, there is a crack apparent on either side? A. Yes.

Q. And what we see in Exhibit 43 is illustrative of the beginning of the fracture which we find in Exhibit 42? A. Yes, sir.

RE CROSS-EXAMINATION BY MR. WOODS.

Q. I learned from Mr. Haddow, and see whether you follow me in this, his experience in connection with the pipe, you take the pipe in a frost jacket and it sinks as a result of the pressing down action of the
20 frost in the early winter. It sinks to a certain extent. Now after that in the spring that cavity if it is made by that pipe being in that position gets filled up and the pipe never gets back its original position because of the fact that the ground up above has filled that up in the spring. That is reasonable? A. Oh yes, absolutely.

Q. Now take this position. Suppose that our suggestion about this matter—the way in which this gas trench was backfilled or not backfilled is not correct. Supposing it was insufficiently backfilled and that in point of fact the twelve-inch main rested in or on insufficient backfilling? A. That is the assumption, yes.

30 Q. And you have this jacking action starting when the frost comes on in the winter pressing down on that. The force exerted by the frost action would follow the path of least resistance, wouldn't it? A. Yes.

Q. And if the trench was not sufficiently backfilled you can quite imagine that force going down and pressing that twelve-inch main down? A. Yes.

Q. And having pressed it down the way it was then in the spring the ground above it fills in the cavity made by the pressing down and it does not come back to its original position again? A. No.

40 Q. And the next year the frost comes down again and before the frost has permeated down so as to make a solid frost hood underneath, during the process of coming down it again forms frost crystals and again those frost crystals press on the top of that pipe, and again there is soft

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 57

Alan
Emerson
Cameron,
Re-Examination
continued.

Re-Cross-
Examination.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57

Alan
Emerson
Cameron,
Re-Cross-
Examina-
tion.

continued.

ground underneath? A. How can there be soft ground the second time? It has been compacted already.

Q. There is certainly six and one-half inches of backfilled ground at this point? A. We assume that, yes.

Q. Well we know that. We know that the pipe sank six and one-half inches?

MR. SMITH: Who knows that?

MR. WOODS: Well, let us assume it then.

MR. SMITH: That is better.

MR. WOODS: If there is any doubt about it, or do you suggest— 10

MR. SMITH: I suggest it never was there.

Q. MR. WOODS: We have at all events this six and one-half inches. Now I am assuming that that pipe sank at that first operation? A. But what is to stop it from going?

Q. Well just assume. A. The frost line to my mind cannot get below it until the pipe starts going down because the frost line is pushing the pipe down.

Q. The frost line rapidly freezes that ground but before it has completely frozen under the pipe, the pipe has been pressed down to the extent of an inch, do you say? Assume that at all events? A. Yes. 20

Q. You would not expect that pipe to come back to its original place? A. Oh no, it won't come back.

Q. The pipe would stay there until the next winter? A. It would stay there indefinitely.

Q. Until another jacket of frost pressed it down another inch? A. But you cannot get away from the argument that the pipeline is going to continue going down so long as the frost is pushing it from above until it meets a resistance which will prevent it going any further.

Q. It will go down with the frost line until the frost line arrives at a place where it makes the earth underneath a solid slab? A. But the 30 pipe has to be below the frost line or you cannot push it down.

Q. In other words, you will agree that the action I have described cannot happen and if it does happen in one year the pipe will not come back to its original place. A. Oh yes, if it happens the first year the pipe line will not go back. I agree with that.

Q. And your suggestion is you do not see why the pipe would not go down the first six inches in the first year? A. Absolutely, if there is room for it to go.

Q. Mr. Haddow has stated they have found these things in their pavement? A. You will find the pavement coming up. 40

Q. And gradually year by year? A. Yes, because you are getting a new layer of frost underneath.

Q. And you are finding the shrinking year by year? A. Yes.

Q. And why should not this act progressively? A. Because nothing to stop it coming up excepting the air, whereas there is the ground to stop it from going down.

Q. At all events, you did not take into account in connection with any accurate computations—you did not compute any amount of stress due to frost jacking? A. We certainly calculated the amount of tension that could be in the pipe metal due to its position within the frost but I certainly did not make any calculation on the bending action of frost jacking because we assumed it would all be done at the end of the first year.

Q. So that this stress that has been described here as a frost action stress pressing on the pipe by reason of the creation of the frost particles was not taken into account by you in making your computations?

A. No, not any bending action due to frost, no.

THE COURT: Is it suggested by either side that there is any significance one way or the other in the fact that the excavation and work in 1931 was done in the spring of that year and the break in the weld occurred in February, 1932, in the winter? Is it suggested by either side that there is any significance in that, from a scientific or practical point of view?

MR. SMITH: No, sir.

No. 58.

Evidence of Robert Starr Leigh Wilson (recalled).

ROBERT STARR LEIGH WILSON (recalled) cross-examination continued by Mr. Woods:

Q. I had somebody reduce your answers as I understood them, about this pipe to this form. You told me your original idea of the way that pipe lay before the break was as shown in these two lines "AA" and "BB." That is what you referred to as a double reverse curve?

30 A. Yes.

Q. That is an illustration of it? A. As immediately before the fracture.

Q. And immediately after fracture it would be in the form of what? A. Well there is nothing explicit about the displacement into a new position.

Q. This point here—this new position, is the one I have endeavored to have marked here in these new lines that we will call "CC?" A. Yes.

Q. That is the way of the new position is it? A. In a slight degree, yes, something of that sort. There would be a straightening immediately

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 57
Alan
Emerson
Cameron.
Re-Cross-
Examina-
tion.

continued.

No. 58
Robert
Starr Leigh
Wilson,
(recalled)
Cross-Ex-
amination

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 58

Robert
Starr Leigh
Wilson,
(recalled)
Cross-Ex-
amination
continued.

adjacent to the fracture, immediately following the fracture. There would be some indeterminate short length of pipe which would unbend itself and thereby become straighter.

Q. Going down into the position marked "CC?" A. Temporarily, yes.

Q. And that happens on the 21st of February. That is when the break was? A. Yes.

Q. And, as we know, it was very cold weather and the whole of that ground is frozen from six to eight inches below the pavement and for some feet below that point. Do I understand you to say that when that pipe broke on the 21st of February that the pipe would force itself into a frost jacket of that kind in the way you have put in that diagram? A. I think there would be some slight straightening there. 10

Q. I tender this sketch for the purposes for which I have asked Dr. Wilson to illustrate his answer.

MR. SMITH: I don't object to it going in if it is understood it is a purely rough diagram.

MR. WOODS: Oh it is just a diagram to illustrate his answers.

Sketch showing vent pipes marked Exhibit 88.

Q. I suggest to you that it would require a good deal more force than would be made by the breaking of the twelve inch pipe to force it down into the ground that is frozen solid in the way you have shown this? A. After the break the pipe is exerting a new pressure against the surrounding ground in its effort to straighten itself within the immediate vicinity of the fracture and that was interfered with I understand for several hours until they were putting on the new sleeve. 20

Q. It certainly would be some pipe barging into that frost slab? A. It depends on the quantitative movement you have in mind. A straightening tendency may be trifling but there it is.

Q. But you have to have the pipe in the double curve in order to provide you with your theory. You have to have your pipe in this double reverse form in order to provide you with the material for your theory of subsidence? A. Yes, sir. 30

Q. And I suggest to you that if your theory is right as to the effect of this 1931 construction draining the ground so as to cause by the drainage of the ground any subsidence as is suggested, if that happened you would find a depression over the whole intersection? A. To some extent, yes, centred on the points we know of.

Q. It would drain the whole intersection? A. Oh yes.

Q. And draining the whole intersection you would see on the pavement at the corner of 107th Street and the lane a saucer depression in the pavement? A. You might. It depends on just what has happened between the pavement above. I think you would eventually get it. 40

Q. And if there is no source of depression it is not likely there has been much depression? A. I would not assume that too rapidly without knowing something about the ground beneath the pavement and the behaviour of the things enclosed within the ground.

Q. Now take the manhole "A" at the time it was built, it would set up a drainage? A. Yes.

Q. And it would be from 1907 on during the early years after that construction that there would be most drainage? A. There would be less moisture held in the ground following that early construction than
10 there would be before it.

Q. And if you have a construction of that dimension draining the ground for over twenty years you are not likely to find the ground a very moist ground are you? A. What do you mean by very moist?

Q. That the drainage that has taken place of the water out of that ground has taken the water that was in the under structure in the underground, away, by that time? A. The installation of the early drainage system there undoubtedly reduced the moisture content of that ground from what it had been before?

Q. And it would reduce it to a very considerable extent? A. How
20 much, I am not ready to estimate.

Q. Would you say the same thing about the construction in 1913? A. Yes.

Q. There were six or seven inch drains to the catch basin built in 1913? A. Yes.

Q. And there was a sewer built up and down 107th Street in 1907. Now all those things would form the basis of drainage of that intersection? A. Every new installation adds to the drainage facilities.

Q. But it leaves a great deal less scope for your suggestion that the building of the 1931 tile sewer had any particular effect so far as shrink-
30 age is concerned when you find installations there and having stayed there over twenty years, of that character? A. But it adds to the drainage facilities of that volume.

Q. I suppose you might add a little bit by reason of it but there is not much left to drain, is there, when you come to 1931? A. The east-west sewer down there is down at the bottom of the centre manhole, the north-south sewer is some vertical distance above it. The only drains installed with the pavement are still above that. The effect of an under-drain depends to some extent upon its depth under ground and the north-east fifteen inch tile sewer installed in 1931 would have some effect by
40 way of added facilities for drainage.

Q. The 1907 construction is just as low as the 1931 construction? A. That is the point I am making.

Q. And the 1907 construction is the manhole without the weir chamber? A. Yes.

Q. And the twelve inch sewer running across the street and down the lane? A. Yes.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 58
Robert
Starr Leigh
Wilson,
(recalled)
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 58

Robert
Starr Leigh
Wilson,
(recalled)
Cross-Ex-
amination
continued.

Q. And it is the lowest point of the drainage of that intersection?
A. Yes, sir.

Q. Now taking that alone without any of the other installations would not you agree that after that has been standing there for twenty years you are going to have drained that ground above it so there is very little moisture and very little capacity for shrinkage in it? A. I cannot agree with you.

Q. Tell me how much would you think that ground has shrunk? A. I can only estimate that indirectly from the evidence we have here.

Q. You are coming back to your theory again? A. Yes to some extent we must. 10

Q. Have you any idea how much that is due to the shrinkage of the ground from drainage? A. Well that is the only shrinkage of the ground I have in mind in all this theory.

Q. And the shrinkage of the ground comes from drainage? A. Drainage by virtue of loss of moisture.

Q. And that is the reason of the shrinkage? A. That is the reason for the shrinkage action.

Q. And that is the only reason for the shrinkage? A. Abstraction of volume in other ways cannot be done. 20

Q. But that is the only reason for shrinkage you can think of? A. You are restricting it to its literal meaning.

Q. The only reason for shrinkage in the draining of the water out of the intervening soil? A. That is right.

THE COURT: Am I right in this, that the Dean said yesterday that there were other factors which led him to give the opinion which he did, generally and now he is limiting these to shrinkage properly so-called. Is that right, as I understand it? A. I understand I am restricted in these answers to the word "shrinkage?"

MR. WOODS: The shrinkage of the ground is due entirely to the expulsion of moisture from it? A. Yes, and I am including also temperature effects. I assume you do not want that. 30

MR. WOODS: I am directing my questions to what I thought was in Your Lordship's mind by reference to something you said this morning.

THE COURT: I thought you were and, like in too many other cases, too much was built up on it. As I understood this witness yesterday he gave three factors one of which was the shrinkage caused by the abstraction of moisture.

THE WITNESS: Yes, My Lord.

THE COURT: I was afraid a lot of this was perhaps because of a foolish remark I made this morning. 40

MR. WOODS: There was shrinkage due to the abstraction of moisture and depression of the ground due to the settlement of the earth into cavities. Those are the two things I heard. A. When percolating or trickling.

Q. The trickling of what? A. Water through cracks and crevices into cavities.

Q. I take that to be a part of your draining the water out of the intervening soil and that the water draining through those cracks would cause the ground to shrink. That is what I thought you meant? A. 10 Water draining through cracks will carry silt with it, which is a part of the content.

Q. Would you give any quantitative idea to the Court as to whether you would attribute the settlement of the twelve-inch main which, according to your theory, was caused by the building of the 1931 construction by the City. Now you have given various reasons for that settlement. Could you divide those quantitatively so as to give an idea whether part was due to the drainage and part to the settlement of the ground or the percolating water or a quarter to one and a quarter to another—I would like to get some notion from you as to what element you attribute this 20 mostly to. A. I cannot support the facts that combine to make a condition which enabled the bending of that pipe to break in so far as the subsidence idea has been worked out.

Q. Then as I gather from your answer to me, you cannot give any separation of those factors quantitatively at all— A. I do not think I dare venture that.

Q. There is no doubt that these constructions in the city in 1907 and 1913 would have some drainage effect that would still be going on from 1923 to 1932? A. Oh it has come to an end by 1931. 1907 and 1913 are the dates of installation and the date of installation of the gas main is 30 1923. There is a lapse of eight years during which time, my opinion is, that a relatively stable condition has been arrived at so far as the moisture content and subsidence and shrinkage of that soil is concerned. And also the sewer parallels the gas main and if it had any further effect it would exercise that effect simultaneously throughout the whole length of it and on the gas main above.

Q. You say in your view as an expert on this subject that there has been no settlement of any kind from 1923 to 1932 as a result of the shrinkage of the soil due to drainage from these city utilities that were there, other than the fifteen-inch tile sewer? A. Nothing material.

40 Q. But was there any? A. Oh I am not dealing in infinitesimals.

Q. Was there any at all? A. There might have been some infinitesimal amount. I won't venture on that.

Q. Have you ever seen an open cut that has been backfilled in the Edmonton soil here? A. Yes, I saw a gas trench, as a matter of fact; it

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 58
Robert
Starr Leigh
Wilson,
(recalled)
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 58

Robert
Starr Leigh
Wilson,
(recalled)
Cross-Ex-
amination
continued.

comes into my mind at the moment, in one of the lanes in the east part of the city. I have forgotten just where. Undoubtedly I have seen lots of others too.

Q. Open cuts that have been backfilled? A. A cut being a trench?

Q. Yes, where the backfilling has been done. A. And there was an open cut in front of my house a year or two ago and it was backfilled.

Q. Did you notice how the sides of that were in front of your house?
A. When it was dug?

Q. After it had been backfilled. A. Nobody has seen the sides of that trench since. The backfilling hides the sides. 10

Q. You cannot say whether you noticed any backfill open cut on which you could observe the fan shaped motion of the earth such as you have described? A. No. The trench we are speaking of was backfilled and you cannot see whether any movement had taken place at those walls or not. It has never been made visible again.

Q. MR. SMITH: My friend asked you to assume that someone had opened up the side of manhole "A" above the weir chamber, standing up to this catch basin cross-over, a cavity between that and some sheeting. And beyond that sheeting there was some ground which was undisturbed ground. He asked you to assume that. Now I want to know from you if 20
in your judgment it is possible for ground in bulk to move and that there should be nothing observable in it to let you know whether it would move or not. A. Easily so. For the reason that the earth between such sheeting and the manhole may have been dragged away from the bottom and a shift take place vertically downwards, this earth below which has dropped, taken away by some process, and you look up and see what is apparently an undisturbed top of a cave. Actually it may be the bottom of a piece of material that has had some movement.

MR. WOODS: You have spoken of the soil having in your view at that intersection reached an equilibrium by 1923, and then it stayed that 30
way—it reached an equilibrium and there was no change in it? A. There would be seasonal fluctuation. Equilibrium does not imply an absolutely static moisture content throughout an indefinite period.

Q. And why should the construction of a fifteen-inch drain, drain it any more if it stayed that way from 1923 to 1931? A. The added piece to the drainage system naturally facilitates a further drainage rate—an increased drainage rate.

Q. Would you regard that as pretty infinitesimal? A. Oh no, that is quite a sizeable excavation that was made for that.

Q. Although it reached a point. What do you mean by equilibrium 40
—it reached an equilibrium? A. When we speak of the word equilibrium in connection with the—

Q. Can you give me a short definition of what you mean by the soil having reached an equilibrium by 1923? I may say I took that to

mean that after 1923 there would not be any more drainage go on, that the drainage had finished up by 1923. Was I wrong? A. I am sorry—entirely so.

Q. So it went on draining after 1923? A. Of course.

Q. And it drained during the years down to 1931? A. As much new rainfall and moisture that it causes, to this volume, and took it away. That is what we mean by equilibrium. It is a faucet, if I may use an illustration which is perhaps dangerous.

10 Q. And we have this drainage here in 1931 and you think that made any difference? A. Yes, it made another faucet.

Q. And you are not forgetting that this street and intersection was completely covered with asphalt paving? A. I am not forgetting that.

Q. If there was movement or settlement of the ground over the weir chamber where would you observe it? A. A cavity is an evidence of ground having moved from a place that it had been in prior to its movement.

Q. You observed it as a cavity? A. A cavity is evidence of movement.

20 Q. So that we have evidence of a cavity here just above and beside the weir chamber and that would show there had been a movement of the ground downward from that cavity? A. There had been a movement of the ground out of the cavity.

Q. And settling down? A. Perhaps some of it settled, if you are thinking of the tile somebody described.

Q. Well that ground went down, according to your information. Am I right? A. It may go anywhere along the drainage channel.

Q. It left a hole that big, anyway? A. Apparently so.

30 Q. And that being so and that cavity still being there it was not that earth that had anything to do with letting down the gas main? A. That earth came from somewhere above where it was seen, apparently so far as the loose earth was concerned and as far as the void was concerned. The earth that was initially there moved out so as to leave a void.

Q. I was asking you where the earth would go? A. Along the drainage channels.

Q. But what I gathered from what you told us was that if there was settlement of the ground you would have to find the earth going somewhere. And when I asked you where, you said well a cavity is evidence of the fact that earth has gone down from the cavity. Of course it is.

40 THE COURT: I understood him to say that the cavity was evidence of settlement and when you asked him what had become of the earth that had gone from the cavity he was giving you his answer. Is that so? A. Yes, My Lord.

MR. WOODS: Where would any earth go that was the result of the settlement of the ground between the top of the weir chamber and the

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 58
Robert
Starr Leigh
Wilson.
(recalled)
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*
—
Defendant's
Evidence
—
No. 58
Robert
Starr Leigh
Wilson,
(recalled)
Cross-Ex-
amination
continued.

gas main? A. It would go through large cracks by way of percolation in part. Some cavitation would drop on to weir chamber ceilings or into other backfill, some of it might compact with the movement of moisture through this backfill and some of it be taken along in the course of the percolation or water movement on the outside of the fifteen-inch pipe and I think the third one I stated was that there is no disturbance of earth when it shrinks. That is one of the factors.

At 4:20 Court adjourns till 10:00 a.m., Thursday, February 1st, 1934.

Thursday, February 1st, 1934, Court resumes at 10:00 a.m.

No. 59
John
Alexander
Buchanan,
Examina-
tion.

No. 59.

10

Evidence of John Alexander Buchanan.

JOHN ALEXANDER BUCHANAN, being called as a witness on behalf of the defendant and having been duly sworn was examined by Mr. Smith and testified:

Q. What is your occupation? A. General contractor.

Q. And you reside in Edmonton? A. I do.

Q. And how long have you been in the general contracting business here? A. Since 1920.

Q. And you also graduated as a civil engineer? A. Yes, from Toronto University.

20

Q. In what year? A. 1909.

Q. And you are not carrying on that profession now. You have been a contractor for some time here? A. Yes.

Q. What sort of contracting have you been doing? A. Building, a certain amount of road work but not much road work, sewer contracting and generally of the engineering contracting nature.

Q. And have you had experience to dig into the soil through the ground in the City of Edmonton? A. I have.

Q. Have you laid sewers in the City of Edmonton? A. I have.

Q. To any extent? A. Quite extensively.

30

Q. And have you had occasion to observe what is known as subsidence? A. I have.

Q. Now you have heard the evidence here with respect to the construction and the manner of the construction of the fifteen-inch tile sewer and the weir box above it at the corner of 107th Street? A. I have.

Q. And you know the place I am talking about? A. I do.

Q. And I want you to give me your view as to the effect of that construction on the earth above it?

MR. WOODS: I object to my friend calling any more expert evidence.

THE COURT: What are the experts that have already been called on that phase—if it may be separated from the others?

MR. WOODS: Dean Wilson and Professor Cameron. And I am of the opinion that Mr. Hill's evidence went to that too. He was called as an expert on the pipeline construction and that necessarily is connected with the question that is now being put.

10 THE COURT: I think that so far as this question as now asked is concerned that being what appears to be the generally accepted view of separation of subjects upon which three experts may be called there have been two only upon this particular subject. I have some doubt as to the correctness of that view and having regard to the difficulty of separating subjects in a case such as this, but I have decided to treat this as a separate subject or topic as so separate that three persons entitled to give opinion evidence upon it may be heard; there have been only two so far, namely, Dean Wilson and Dr. Cameron, who in that view may be said to have given expert or opinion evidence upon the subject.

20 Q. (Question read): "And I want you to give me your view as to the effect of that construction on the earth above it?" A. I wonder if I might go down to the model so that I can follow the course of the construction through? It would be much easier to explain that. (Witness explains by model.) In conjunction with the storm sewer this manhole "B" would be, or the excavation would be the first operation in connection with this fifteen-inch sewer. Then it would be tunnelled from here as the evidence has said, towards manhole "A." Then I understand from the evidence that this manhole was left intact until this sewer was laid. You have a distance of about twenty-eight feet here between the two manholes, and while it is quite possible to drive a tunnel of that length
30 and keep it straight and fairly well to grade so that you can do the pipe laying in a tunnel of that size and that type it is impossible, in my opinion, to so backfill it that it will not later consolidate and leave interstices within the tunnel. Now from my experience in tunnel work where you have a cleavage plane at the end of the tunnel—

40 Q. What do you mean by that? A. Where you have a cleavage plane at the end of a tunnel you have a natural point where the breaking away would start. I might explain it in this way. When we dig trenches down to grade, in our operation before starting tunnelling one of the first things to do, if you are in ground that is unstable, is to attempt to get one or two timbers to support that area. Sometimes you can drive through the tunnel without any difficulty. I might explain why that is the case. You have the arch of the tunnel in the centre with a portion on each side of any particular area helping you to carry that support but at the end you merely have the arch and you have the cleavage plane which

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

—
No. 59
John
Alexander
Buchanan,
Examina-
tion.
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 59
John
Alexander
Buchanan,
Examina-
tion.
continued.

does start to break. Therefore, in my opinion this tunnel might be fairly well compact as far as caving in goes a great part of its life or most of its life. But this point here at the weir chamber is the weak point and that is where caving will start. The cleavage plane is lower than the weir chamber and you come to a point where you have a natural cleavage plane and further back at the manhole you have a cleavage plane. In other words you have not the support from all four directions but only from the three.

Q. How in your opinion could that tunnel and excavation for the weir chamber have been properly backfilled? A. Well it is a practice 10 where careful consolidation is important.

MR. WOODS: Your Lordship will observe that my objection stands as to the question. Perhaps I ought to remind Your Lordship of it now. In my estimation it is going outside Your Lordship's ruling. The proper backfilling of tunnels was not within Your Lordship's ruling and Mr. Hill's evidence certainly referred to that. At all events Your Lordship's ruling does not cover this question.

THE COURT: You are quite right as far as that is concerned.

MR. WOODS: I have forgotten, frankly, but I think the general subject of Mr. Hill's evidence covered it. 20

THE COURT: I think Mr. Hill was not put forward as an authority upon this phase of the whole matter, if I am right in the separation that I have made. A. (The witness): Well it is a practice where careful consolidation is important, to rely on water flushing. There are differences of opinion on whether water flushing is absolutely satisfactory but at least it is a practice in this city and I think it is fairly effective. In other words, a tunnel will be filled with what we might call loosely compacted earth and then water will be forced down through this trench and it has really a hydraulic effect of carrying particles of earth and soil and the pressure from the top forcing it down into the tunnels and gradually 30 consolidating it. You will put a fire hose down here and it will be gradually filled up and water will force it into the tunnel—around manhole "B" there will be a certain area that has been loosely backfilled and then water forced out through into the tunnel. Then you take it from the other end. Of course the effectiveness of that requires that you must have an area of flow of water. You have to have certain pressure from above in the trench or in the manhole.

Q. MR. SMITH: Could it be done with manhole "B" closed off? A. With manhole "A" absolutely closed I maintain that water flushing could not fill that tunnel. If it had been open at this end— 40

Q. "This end" being manhole "A?" A. Yes. You would have had the free flow of water through here and, like as it does flow in new sewer constructions, you could have done a very good job as water flush-

ing goes on that principle, but I maintain in this particular case that all that could happen was that this tunnel would fill up and the water would lie static and does not have that carrying power it would have had if you had had a full flow. Therefore in a short piece at manhole "B" water flushing would have been effective.

Q. Now a short time ago had you occasion to go down into manhole "A?" A. I did.

Q. That was within a month? A. That was just a short time ago. I went down with Dr. Cameron.

10 Q. Did you have occasion to observe the catch basin drain running from the catch basin to manhole "A," that is the northeasterly drain? A. Yes.

Q. What would you say as to what you observed? A. I would like to go down to the model again in order to properly explain. I might say that I heard the evidence yesterday and also Mr. Woods' announcement that Mr. Ruff had been in the manhole since, and I will give my opinion and will probably try to answer Mr. Woods if I may as far as that goes. Will that be perfectly proper?

MR. SMITH: Well you had better tell just what you observed on
20 there? A. When I went to manhole "A" to this point, where the six-inch sewer opening comes into manhole "A," we had a flashlight attached to a cord. It was the ordinary flashlight. We had a handle about, well it was an extension handle, on, so we could reach in. I never measured it so I am not going to give an opinion exactly how long the handle was. I shoved that flashlight up as far as I could so it would give me a better idea of the course of the drain and I found that from a point at manhole "A" to a point considerably along toward the catch basin opening that
30 there was a decided drag down towards the north and downward. Now I am not maintaining that this point where the greatest drag occurred which would probably be about two and one-half or three feet beyond the wall of the manhole was actually lower than the manhole but nevertheless it was very distinct. When I say that, I do insist, however, that it had been dragged down to the north and to the south out of the natural grade line of the length of the sewer. In other words, this was depressed down towards the north and then took a line back. This drag would be north and the one further away naturally would appear to be south because on account of the portion nearer the manhole being dragged north. There was real indication in my opinion of earth movement taking place here causing that dragging down.

40 Q. In your exploration work have you ever had occasion to cut across an old sewer ditch in Edmonton? A. It just so happened that on several occasions I have cut across.

Q. And could you find—were the walls of the old ditch indicated? A. Very distinctly.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 59
John
Alexander
Buchanan,
Examina-
tion.

continued.

Q. And what have you to say with respect to the size of these old ditches?

MR. WOODS: I am objecting.

THE COURT: What has this to do with his opinion evidence on the given circumstances upon which I have based my ruling?

MR. SMITH: Perhaps I may explain that and it will become quite clear that in cutting across these old ditches it has been clearly shown that the walls have come closer together.

THE COURT: Are you now dealing with the particular kind of earth found in Edmonton or the particular sewers which he dealt with? 10

MR. SMITH: It may not be admissible. I thought it was of value when it was in the City of Edmonton and he had found this behaviour of earth.

MR. WOODS: My friend would not have the City Engineer go over all the sewers in Edmonton?

MR. SMITH: No, I would not do that.

MR. WOODS: It would be rather a long job.

MR. SMITH: Longer than this, surely.

THE COURT: I think that going into that field might offend against the idea I have expressed more than once of its requiring the canvassing 20 and the determination of the controversies which might lead into a field which would be beyond this trial.

MR. SMITH: Yes, My Lord. I made some such sort of suggestion when we began.

THE COURT: And, as so often happens, one finds that counsel for the other side must take a similar position even if it differs from the one in chief he advances, because, as I heard counsel say once, counsel are not bound by previous opinions.

MR. SMITH: Of course I am accepting your ruling but I want to explain that the way I hoped to make it evidence was the contraction. 30

THE COURT: If you can show the kind of ground that is in these other places is so similar to the ground found at the particular locality that we are now dealing with, that the evidence would be of value, then I think you are right.

MR. SMITH: In your years of experience here have you ever observed to any appreciable extent the frost jacking down?

MR. WOODS: Well quite independently of that I do not know whether my friend is asking for opinion but this gentleman is not qualified to give it if he is.

*In the
Supreme
Court of
Alberta*

THE COURT: I think the question itself deals not with opinion but with fact.

Defendant's
Evidence

MR. SMITH: I framed it in that way, sir.

THE COURT: Of course depending upon his ability to observe such facts.

No. 59
John
Alexander
Buchanan,
Examina-
tion.

MR. WOODS: If my friend goes further and asks anything that
10 arises in this man's view I certainly object.

continued.

MR. SMITH: May I have the question answered?

THE COURT: Yes.

MR. WOODS: My friend is taking the risk if this witness gives in answer to his question of fact something that is an opinion on the action of frost. Then most decidedly I am going to claim my friend is offending against the rule.

THE COURT: The question will be read to you by the Court Re-
porter and it is capable of an answer yes or no, and do not do any more
than that as far as this question is concerned. (Question read). A. No,
20 I have not.

CROSS-EXAMINATION BY MR. WOODS.

Cross-Ex-
amination

Q. You are in business as a contractor and have been for some time in Edmonton? A. Yes.

Q. How many years? A. Since 1920.

Q. You are a business man. You are not a technician, properly, are you? A. I have not lost the art. I have certainly technical training and I cannot forget that.

Q. Well that is so much the better for my questions on this matter to you. I do not think I will be very long. You spoke of being down in
30 the manhole "A" with a flashlight like you described and putting it into the six-inch tile catch basin sewer? A. Yes.

Q. And what is the construction of that six-inch tile sewer? Just let me see if you and I agree upon it. It is a six-inch drain to the catch basin on the side of the street? A. From the catch basin to the manhole.

Q. To carry the water down that comes down in the catch basin down into the manhole? A. Quite.

Q. And at the manhole—it is cemented into manhole "A?" A. Yes.

Q. And it is made of tiles? A. Sewer tiles.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 59

John
Alexander
Buchanan,
Cross-Ex-
amination
continued.

Q. Round sewer tiles. How long—six inches? A. The six-inch comes in two foot lengths if I remember.

Q. Your memory is it is a two foot length and there is another two foot length put on the end of it and so on to the catch basin? A. Yes.

Q. It is cemented into the manhole and it is cemented to the end of the tiles? A. To each individual tile, one cemented into the other—a bell tile.

Q. The only thing that holds the tiles together is the cement? A. And the one being inserted for the depth of the bell into the other.

Q. And how far is that? A. I think about two and one-half inches 10
but I am not positive because I have not actually measured.

Q. Did you ever put down one of these? A. I have.

Q. And do you think there is two and one-half inches of a groove, an overlap, of the one end of the tile over the other end of the tile? A. About that.

Q. And we have taken the opportunity over the adjournment to have three completely reliable people examine this thing so we are not going to be in any doubt before we are through today as to just what this is? A. Well I have given my absolute opinion on it — honest opinion. 20

Q. This is the kind of thing it is (produced)? A. Yes, just exactly.

Q. And this is the end of the other piece? A. Goes in there.

Q. And around the end of that there is cement put? A. All around. That is made practically as closely as the job can be done. That becomes one length of pipe. It is perfectly cemented in there solid and the cement grips all parts.

Six inch tile pipe marked Exhibit 89.

Q. Now referring to Exhibit 89 this larger end of the first tile which is cemented into the manhole "A", or is it the other end? A. Well it would be the other end. 30

Q. The small end is cemented into manhole "A"? A. Yes.

Q. When was it that you saw that six inch tile? A. I did not take a note of the date. But it must have been about two weeks ago but that is not definite. That is generally speaking.

Q. It is in that neighborhood? A. Yes.

Q. And as you saw it when you looked at the end that was cemented into manhole "A" and the first tile, did you observe whether there had been any sinking down of that tunnel? Do not let us get at cross purposes and don't make any great long speech. It is a simple question. Did you notice any sinking downwards of that first tile? A. 40
It could not sink at one end because it was cemented in the ground.

Q. Is your answer in the negative—that you did not notice any sinking down of that first tile? A. May I qualify an answer when I cannot answer yes or no?

Q. It seems to me that you were there with a flashlight and the question seems to me to be capable of a categorical answer. You clearly did or did not notice something.

MR. SMITH: It is only an estimate.

THE COURT: The witness says he cannot answer your question categorically.

MR. WOODS: Well answer it the best way you can. A. Naturally the end actually in the manhole—there could be no lowering because it was held up by the manhole. As you gradually got away from
10 the manhole, the six inch sewer in my opinion gradually dropped off its regular key to some extent down and to the north, as I explained before.

Q. I am told that the tile is two feet from the shoulder to the end?
A. Yes, that is right, I believe.

Q. Now for the first two feet of that tile did you notice the first time any appreciable sinking downward of any part of it? A. I noticed a trend that way as you got away from the manhole.

Q. So I would take it that for our purposes I am properly epitomizing your evidence in saying that all you noticed was so far as the first
20 two feet away was concerned was a trend downwards? A. As you went away from the manhole?

Q. Yes, a trend downwards? A. Yes.

Q. And as you went to the second and third and fourth tiles, that is a matter of eight feet in there, would you say that that trend continued or not? A. I cannot answer you definitely by tiles because I did not take a note by one, two or three tiles.

Q. Well I will put it in feet if you like. You were observing it from the manhole? A. I was.

Q. And you were observing it with a flashlight on the end of a
30 stick, was it? A. I think it was an iron stake about that length (indicating about eighteen inches).

Q. And how many feet in your estimation would you be able to observe it? A. I could see back at least twelve feet. I made no measurements whatever.

Q. Well, we will call it twelve feet. Would you say that for the distance you saw it, for that twelve feet inwards from the manhole, that trend continued or not? A. The trend as indicated in the swing of the tile continued. I am not going to tie myself down to feet but I could see far enough back where the curve came back to straighten out
40 to the manhole.

Q. Well do not let us get at cross purposes. I am not now questioning you about a trend to the north or south or a swing to the north or south. What I am interested in is what you have told me about a

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 59

John
Alexander
Buchanan,
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 59
John
Alexander
Buchanan,
Cross-Ex-
amination
continued.

trend downwards. Am I right, that you saw a trend downwards in that construction of that six inch tile? A. Absolutely right.

Q. Now did that trend downwards continue during the distance that you saw it? A. During the full distance of the twelve feet that I estimate that I saw?

Q. Yes? A. The trend downwards was more or less of a curve and I could see where it apparently was, to the point where it reached the old or permanent grade, in my opinion.

Q. Will you tell me whether the trend downwards that you have mentioned on that sewer continued for the estimated twelve feet in- 10
wards that you say you saw the sewer? A. Approximately, yes, run-
ning to a minimum of course as you get out further away from the man-
hole. I would not try to place—

Q. What do you mean by running to a minimum? A. Naturally if you have a swing of a pipe or bow or bend you have a maximum at one point and a minimum at the other. And I suggest that the minimum was in towards the end of my vision at that point.

Q. So that, as I interpret you, your observation of the thing was that right beside the manhole there was a trend downwards which lessened so that the tile drain flattened out and took a level position towards the 20
end of the twelve feet? A. Not a level position. I am viewing it en-
tirely on the basis of the relative or its present relation to what its
previous grade was. None of it is level. It is graded down—it is running
on a grade.

Q. I want to get this clear, that as you saw that six inch tile sewer, with its trend downwards as you have described it, it had not dropped downwards from its vertical position more than half an inch? A. I would not say that. I never measured it.

Q. Well you saw it with your eye. You told me there was a trend downwards from the manhole. I am asking you whether in point of fact 30
your observation of it—would you agree with me in your observation of
that tile sewer that it did not drop from its vertical position more than
half an inch? A. No, I would not say more than that.

Q. How far would you put it? A. I would not definitely tie it down but it was definitely perceptible.

Q. I used the wrong word. I ought to have said horizontal position. You say there is a trend down. Now as I gather there is a trend down-
wards. Will you give me any quantitative estimate of that trend down-
wards? Did the downward movement of that piece of construction
continue to the extent or further than or longer than half an inch? A. 40
I am not going to tie myself down to inches because the next would be
an inch and two inches, and I have not measured it and won't there-
fore attempt to do it.

Q. Then I am right in stating that your answer to me amounts to this, that you will not say to the Court that that downward movement

of that six inch tile sewer extended for more than half an inch? A. I would say that it was definitely perceptible.

Q. I think you can answer my question categorically because it is the result of your answers to me. You will not pledge your oath or give evidence in this court that that downward movement extended for a greater distance than half an inch? A. Not without measuring.

Q. And you have not measured. You have not measured. That is right? A. That is right.

10 Q. And therefore you will not say it is more than half an inch? A. I will say nothing more than I have.

Q. I am afraid I am going to ask you to answer that question. I put it to you, you will not say now from your observations of that tile sewer that the downward movement of it exceeded half an inch? A. I will say that I believe it to be, but I won't take my oath on anything that I am not sure of.

Q. You believe it what to be? A. To be more than you suggested.

Q. Would you say you believe it to be more than an inch? A. That is where I expected to be led in the first place and I therefore think I should not be asked to go any further.

20 Q. Now you say you know of the character of the soil movement. In fact, you pose as an expert in connection with soil movement, as I get it, in connection with these Edmonton streets. You think you are qualified to give opinion evidence on the movement of soils on the Edmonton streets. A. I think I should be. Some of them cost me money and I had to study them.

30 Q. Now if there is a downward soil movement at the part of this model that I have my hand on, which is just above and beside the weir chamber and over the fifteen inch tile drain at that point—if there is a downward movement of that soil I take it you will agree with me that the whole of the soil above it moves down? A. I do not just—are you taking vertically above?

Q. Yes. A. Do you mean immediately?

Q. Do not let us quibble.

THE COURT: Just there now, please. The way the evidence affected my mind, I do not think that is quibbling.

MR. WOODS: Well I will take it from you. Let us get straightened up. Underneath that street at the place where we are mentioning about that fifteen inch tile sewer originally goes through virgin soil, doesn't it? A. So I am told.

40 Q. There is a sandy clay slope of virgin soil before that tile is put in and that is the way you find it right up to where the top soil is. That is the ordinary thing. There is a clay sand belt? A. What particular part of the fifteen inch sewer are you referring to?

Q. I am speaking of the whole thing. A. Remember, you had your

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 59
John
Alexander
Buchanan,
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 59
John
Alexander
Buchanan,
Cross-Ex-
amination
continued.

hand on the weir chamber. That is part of the fifteen inch sewer construction and conditions there are quite different because you have had a manhole and three or four sewers and all sorts of things put in there.

Q. Take your ordinary virgin soil. It is a solid bank of virgin soil?
A. If that is virgin soil, yes.

Q. And as we have had it described here, it is clay and sand. Now then you drive this construction through that soil. And as you drive it through we will assume for the purposes of my question that the soil above it, and now I am referring to the place I had my hand on on the model, settles down. We will assume that. Now if that settles down 10
at that place am I not right in suggesting to you that it settles down vertically above it—the whole slab goes down? A. Not necessarily, no.

Q. How far does that settle and extend upwards? A. Over what period of time?

Q. Well over twenty years, if you like, or twenty-seven years—from the time the thing was built. A. I am afraid I cannot answer a question like that.

Q. We have got here a gas main, a twelve inch gas main right above that part of it, right above that place where you saw this tile sewer? A. Yes. 20

Q. So as to be quite sure of it. You see that twelve inch gas main crosses that six inch tile sewer within a very short distance vertically of the place where the break was? A. I can see the relative positions from here.

Q. We will assume for the purposes of my question that that gas main has sunk down six and a half inches—subsided six and a half inches by reason of the ground at the manhole weir chamber above and beside the weir chamber and above the fifteen inch tile drain subsiding. We will assume that. You will understand me. A. I understand you are assuming that, yes. 30

Q. What would be the effect of such a subsidence on the six inch drain?

MR. SMITH: Perhaps I should point out to my friend that I have not asked anything about gas pipes or drain pipes. I confined myself to the ground. And may I suggest that this opens the door very much wider to me than I went in the first place.

THE COURT: Is not that right? Aren't you perhaps opening up?

MR. WOODS: My learned friend can re-examine to his heart's content on anything I bring out now, but I want to know what this gentleman knows about the subsidence of ground and where the subsidence 40
as alleged would affect the six inch tile sewer.

Q. What would be the effect of such a subsidence as I have assumed on the six inch tile sewer that you looked on with the six inch flashlight? A. About the effect that I saw and met.

Q. That is to say, you have got this structure up above sinking six and a half inches as a result of a subsidence caused away down below both structures. And am I not right in suggesting to you that necessarily that means that that ground would have carried the six inch tile sewer down as far as it carried the gas pipe? A. No, not necessarily.

Q. Why? A. Because the tile sewer forms an absolute bridge wherever it might be solid and is definitely cemented into the manhole. You have the gas pipe free from one end to the other following the movement down.

10 Q. And I understood your statement to the Court to be on the assumptions I have made of a six inch subsidence in a welded gas pipe that a six inch tile sewer that is only held together by cement—

THE COURT: You understand that without looking at it? A. Yes.

Q. MR. WOODS: Is not going to subside to the extent of sixteenth of the subsidence of the gas main? Do I understand you to say that? A. I said it could not possibly subside there because it is bridged. It is definitely cemented into the manhole and all you can do is to get the trend. I am not assuming there is a definite drop down of six inches
20 immediately subsiding six inches, and the whole is dropped down six inches. That is not the effect of subsidence.

Q. I am asking you to assume there has been a subsidence of six inches as a result of the construction of the weir chamber and of the fifteen inch tile sewer? A. Yes. I have not any doubt as to the assumption.

Q. And you see the position of the gas main with relation to this six inch tile sewer you were examining? A. Yes.

Q. And I suggest to you that any such earth movement as would carry that twelve inch gas main down six inches as would allow it to
30 subside six inches would fracture and break that tile sewer that is just below it. And I ask you if I am not right. A. I do not think you are.

Q. Why am I not? A. Because as I have stated there is a definite bridge from the manhole to the point where the more stable earth further away from the manhole exists and that in itself would resist to a considerable extent any dropping whatever, but on the other hand if there is some movement of dirt there it will tend to drag it and bend it with it. If there is a definite dropping away of the ground there which I do not say there is—and when I say definite I mean in fairly large volume instead of just gradually coming down—it might even have
40 dropped away from that sewer and still there might be a hold around it. I do not know. That is just all supposition.

Q. I am afraid we are not going to get rid of each other as quickly as that. If you have a subsidence in the ground below those two structures that carries the ground above downwards so as to allow the top

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 59
John
Alexander
Buchanan,
Cross-Ex-
amination
continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 59
John
Alexander
Buchanan,
Cross-Ex-
amination
continued.

one to fall, am I not right in saying to you that the one underneath will fall too? A. If the conditions under which they were placed in the ground were absolutely the same and lying parallel and one was not fixed and one did not have a fixed point, almost immediately above the point that we are discussing, why yes. But the conditions are not the same and the action would not be the same.

Q. Do I understand you to say that the other end of this bridge that you have mentioned in explanation that holds up the six inch tile sewer, that that part has not subsided and the rest has? A. In a less degree it has subsided probably. 10

Q. And how far does that tile sewer go before it reaches a point where the under-subsidence of the earth has not affected the earth above it, how many feet? A. Oh there is no way of telling. I can't tell you.

Q. Now come to the sewer on 107th Street? A. Yes.

Q. It seems to me that for this purpose we can inject our own common sense into the thing. A. That is what I have been trying to do.

THE COURT: I have been wondering, Mr. Woods, how far I will be able to inject my own. I do not know yet.

MR. WOODS: It would seem to me, my Lord, that when you get a condition of that kind it does not need experts to tell what happened. 20

Q. Take this eight inch sewer running down 107th Street. If there was subsidence above manhole "A" and above the fifteen inch tile sewer which resulted in this twelve inch main falling down to the extent of six inches, would you not see some evidence of that in the eight-inch sewer up and down 7th Street that I have my hand on here? A. Was that question to me, Mr. Woods?

Q. Yes. A. Probably.

Q. I suggest to you that that being the case, the situation being such as it is, if you have a subsidence such as is suggested here that has allowed the earth to subside so as to let that twelve inch gas main 30
down to the extent that it has fallen that that 107th Street sewer will have gone down with the earth in just the same way as the gas main? A. I do not think so and if I may try to explain at the model I will try.

THE COURT: Only if Mr. Woods wants you to make the explanation.

MR. WOODS: You say you do not think so? A. No. But I would like to tell you why. I do not like to appear ridiculous.

Q. Now you agree with me that you would expect however to find some evidence of shrinkage in the 107th Street sewer under those conditions? A. Not as much as the other. 40

Q. We put the other at six inches. How much would you expect the 107th Street sewer— A. It seems to me to be on the limit of any subsidence effected as I picture the subsidence in that particular area.

It goes out in a funnel and it will just about intersect and probably affect very little of that particular sewer. If it were just a little bit lower it would not affect it at all.

Q. And you would give a much narrower angle than forty-five degrees in regard to that fanning out effect we have had evidence of? Here is the manhole and here is the weir chamber? A. That is not the intersection of the weir chamber and the funnel off.

Q. Here is the weir chamber and the suggestion is that there has been subsidence over that weir chamber at a point, that as I remember
10 the evidence, is on the side or front of the weir chamber and covers over the top of the weir chamber and the point nearest to this 107th Street sewer. So that it would be almost immediately below it? A. I suggest that you twist it on the side. "Y" is the mark on the other model.

Q. At all events you think you noticed some evidence in the 107th Street sewer of this movement but quantitatively would not like to give an estimate of what it is? A. I would think that that line—I can just judge it from the centre of the manhole.

Q. Do you think it would be affected at all? You told me you
20 thought it would. A. I said very little.

Q. How much—dropping down an inch or two inches or what? A. I won't say inches at all. It has a restraining effect like the manhole, trying to hold it in place.

Q. And your evidence on the water flushing is, you think it is proper practice to put water flushing from one end of a backfilled trench to the other so the water will go right through the backfill? A. Water and earth. You have to put earth in at the same time.

Q. But you would have both ends of the trench open and you would come out at the other end. Is that what you would do? A. Yes.
30 I want to back flush from both ends.

Q. And the net result of that would be to carry away a lot of your backfill? A. I don't agree with you, because I have done it in practice and I have gone to one end and the other and gradually compacted them and I know from practice it does not.

No. 60.

Evidence of Horatio Ray Milner.

HORATIO RAY MILNER, called as a witness on behalf of the defendant.

MR. WOODS: What is Mr. Milner called for? He is only entitled
40 to be called on one thing, my Lord.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 59
John
Alexander
Buchanan,
Cross-Ex-
amination
continued.

No. 60
Horatio
Ray Milner,
Examina-
tion.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 60

Horatio
Ray Milner,
Examina-
tion.

continued.

HORATIO RAY MILNER, duly sworn, was examined by Mr. Smith and testified:

Q. You are one of His Majesty's Counsel learned in law? A. I believe so. It is quite patent.

Q. And what position do you occupy in the Northwestern Utilities Limited, the defendant in this action? A. President and Managing Director.

Q. How long have you occupied that position? A. As president upwards of two years.

Q. And prior to that what was your connection with this company? A. Prior to that I was a director. I became a director in January 1926. Prior to that from the organization of the company I was the solicitor for the company. 10

Q. And did you organize this company? A. Well I had a great deal to do with its organization.

Q. And you have been in very close touch with its affairs from that day to this? A. Yes.

Q. And is it a company which operates under the jurisdiction of the Board of Public Utility Commissioners? A. It is.

Q. I want to ask you now one question about the Canadian Western Natural Gas, Light, Heat & Power Company Limited. 20

MR. WOODS: I do not see what issue on the pleadings raises anything about that.

THE COURT: Well I cannot tell now whether it does or not, so I will allow it.

A. That company, commonly known as the Calgary Gas Company, was incorporated under the Alberta Companies Act and still remains so.

Q. We have heard that the City construction and distribution plant of this Edmonton Company was built in 1923? A. That is correct.

Q. And prior to its building what authority did it get to go through the streets of the City of Edmonton? A. It obtained by assignment from the Northern Alberta Natural Gas Company Limited the franchise under which the plant was constructed and under which it now operates. 30

Q. And this present company, what is its incorporation? A. It is incorporated under the Canadian Companies Act.

Q. And have we filed the assignment between the Northern Alberta and the Northwestern Utilities? A. Yes, it was filed with the Alberta Board of Public Utility Commissioners and it was approved.

Q. At what time? A. Effective the 1st of June 1923.

Q. And have we a copy of it we can put in here? A. I have not got it here but one can be readily obtained. 40

Q. I will undertake to file a copy. Now you have been in close touch with the investigation after the fire in February, 1932 at the Corona Hotel? A. Yes.

Q. Two men have given evidence here by the name of Farquhar and Kohn. When did you first receive any information from them, I mean in the line of evidence which has been given?

MR. WOODS: I am taking objection. The communications between Farquhar and Kohn and Mr. Milner are not relative to evidence against us.

MR. SMITH: I am merely asking the time he first received any information.

MR. WOODS: That is no more evidence than the contents of them.
10 to try and support these men by some date—

THE COURT: What is the reason for asking this question?

MR. SMITH: The reason is that it as a long time subsequent to the fire that any of the persons in this company heard of the information which these gentlemen had.

MR. WOODS: That is not material in anything against us.

THE COURT: Has it anything to do with notice or knowledge prior to the occurrence, prior to the fire?

MR. SMITH: No, I am referring direct to the evidence they gave with respect to the cavity under the pavement.

20 THE COURT: The answer you expect will be some time later than the fire.

MR. SMITH: Much later.

THE COURT: I do not know that you should be allowed to support the credibility of the witness by such evidence and I suppose that is all it can be—to support, not simply the credibility, but the weight of their evidence. I rather think the objection is sound.

MR. SMITH: Very well, my Lord. Now, Mr. Milner, Exhibit 6,
30 without my going through it, contains the contract of the defendant company with Williams Bros. and also the franchise of the company is contained in this agreement? A. It is referred to. It is recited.

Q. And this exhibit is the one under which this transmission and distribution system was constructed? A. It is.

Q. Now we have heard that the pipe across 107th Street was taken up and relaid in June, 1932? A. It was.

Q. And we have heard it was re-laid in the same manner, that is by putting in welded—

MR. WOODS: I object to that. I do not remember it, but if it was so it was led by my friend because if I cannot give evidence to show the effects upon the plaintiff he cannot give evidence in support of them.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 60
Horatio
Ray Milner,
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 60

Horatio
Ray Milner,
Examina-
tion.

continued.

THE COURT: I have not attempted to make a ruling upon your right to give evidence of such things as come within or are said to come within the principle of Toll vs. C.P.R. I have not made a ruling against you on that. I do not remember how it came out.

MR. SMITH: Well if my friend is not interested in that I am not either. I am quite content to let it go.

MR. WOODS: I do not want any questions my friend may ask Mr. Milner that are improper, to be answered, because I suspect them.

MR. SMITH: May I tell you about my suspicion of my friend? What I had in anticipation was simply this, that in as much as we replaced this line in the same way and in as much as we now claim that there was a subsidence at that point which broke our line I anticipated that my friend would properly argue before your Lordship that we were perhaps somewhat insincere as we did exactly the same thing after certain conditions had been revealed. And it is for that reason I wanted the responsibility placed for the reason given why that line was re-laid in the same way. 10

MR. WOODS: I do not admit it was re-laid in the same way.

THE COURT: I do not realize the evidence showed so far it had been re-laid in the same way.

MR. WOODS: How the line was re-laid, in my submission, is not material to the issues in this action. 20

MR. SMITH: Well if my friend says that I accept it. And our suspicions of one another were both unfounded.

Q. Did your company receive any notice of the construction by the city of the fifteen inch tile sewer and weir prior to its construction? A. It did not.

MR. WOODS: I object. I cannot find anything on the pleadings to which this evidence is directed.

THE COURT: The objection is certainly overruled. The answer may be made as it has been. A. It did not. 30

Q. MR. SMITH: Did your company receive from the City of Edmonton any notice of the construction of the wooden conduit box in 1926? A. It did not.

Q. MR. WOODS: I object.

THE COURT: The objection is again overruled, covered by the previous ruling.

Q. MR. SMITH: Was any order ever issued by the Board of Public Utilities Commissioners of this Province instructing you to build, locate, maintain or repair this distribution system in any manner other than that in which it was located, constructed, maintained or repaired? 40

MR. WOODS: I object to that. Any orders made by the Public Utilities Board can be proved in the proper way. That is not evidence of the order nor is it evidence of the absence. There is a proper way of proving this.

THE COURT: Subject to cross-examination I think the question is quite proper and may be answered.

MR. SMITH: Will you answer me, Mr. Milner? A. No such order has ever been made.

THE COURT: Now that answer taken to the question might by
 10 some be considered as ambiguous. I think I know what he means, but someone might think you were at cross purposes. What I understand you mean is there has been no order of the board directing the company to construct its works otherwise than in the manner in which you say you constructed them? A. That is correct, sir. It applies to the whole of Mr. Smith's question.

MR. SMITH: I am showing you some correspondence between your firm which is the firm of Milner, Dafoe, Poirier & Martland, and my learned friend's, Mr. Woods' firm of Woods, Field, Craig & Hyndman,
 20 and I am asking you to make such use of that correspondence as you see fit. This is for the purpose of showing that certain plaintiffs were users of our gas and under what conditions and circumstances? A. Well this correspondence was written in reply to a notice to admit certain facts and the effect of it is, and Mr. Woods' firm complied with the notice to admit by obtaining from several clients who were users of natural gas supplied to them under contract with Northwestern Utilities, letters, copies of which letters are attached to the letters from Mr. Woods' firm.

MR. WOODS: I suggest the notice to admit be put in.

MR. SMITH: I will attach it and mark it.

Notice to admit with reply thereto, marked Exhibit 90.

30 THE COURT: You say these are plaintiffs in the action?

MR. WOODS: Either for or on behalf of the plaintiffs.

MR. SMITH: Now have you, aside from this, any contract, first with the Corona Hotel Company? A. I have under my hand a contract dated January 3rd, 1924, signed Corona Hotel Company, Limited, per A. Dyer.

Q. And is that the contract under which you have since that time been supplying gas to this plaintiff? A. It is.

Q. I tender this.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 60
Horatio
Ray Milner,
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 60
Horatio
Ray Milner,
Examina-
tion.
continued.

MR. WOODS: I mention with regard to this Exhibit that the solici-
titors for the Corona Hotel Company refer to it in the correspondence al-
ready in. There is nothing to show that Dyer is entitled to sign it.

MR. SMITH: Perhaps they will admit it.

MR. WOODS: No. They said just what they said on their examina-
tion for discovery.

MR. SMITH: Did you supply gas to the Corona Hotel Company or
any other contract than the one I hold in my hand and which I tender as
an exhibit? A. No.

Q. I tender it as an exhibit. 10

MR. WOODS: This is the letter (reading). I wrote and asked that
my previous letter be withdrawn. That is what it stated. I cannot admit
anything more.

THE COURT: They are separately represented here, I understand.
Have you anything to say about this Mr. Cairns?

MR. CAIRNS: Nothing beyond what Mr. Woods has said. Dyer can
be called as to his capacity.

THE COURT: Do I understand I can assume it to be a fact that the
Corona Hotel did or rather the defendant did supply gas to the Corona
Hotel Company Limited under some contract? 20

MR. CAIRNS: I think it can be assumed gas was supplied to the
company.

THE COURT: Under contract?

MR. CAIRNS: I cannot say as to that.

THE COURT: I will admit the document but maybe, Mr. Smith,
you may have to go further. I do not know.

Contract for supplying gas to Corona Hotel, marked Exhibit 91.

MR. SMITH: What contracts have you got or what applications
from plaintiffs other than the Corona Hotel? A. I do not think I have
any other contracts that add anything to what is already in in the letters. 30

THE COURT: How important is the question of the terms of that
contract?

MR. SMITH: The terms of it are not, in my judgment, of great im-
portance. I intend to read certain discoveries and I think your Lordship
will agree it is proper.

MR. WOODS: You do not base anything upon the particular terms of the contract itself?

MR. SMITH: No. The whole point is we were supplying these people with gas under a contract. That is all.

THE COURT: Then it is not very important.

MR. WOODS: No.

THE COURT: Either the contract itself or the authority of the person who signed it?

MR. WOODS: It does not become of importance. I do not think it is a matter of any moment at all. The only moment was if there was something to be argued from the terms and conditions of it.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 60
Horatio
Ray Milner,
Examina-
tion.
continued.

CROSS-EXAMINATION BY MR. WOODS

Cross-Ex-
amination

Q. I am curious to get one thing clear. This gas that we get in Edmonton comes from the Viking fields? A. It does.

Q. And when it comes into Edmonton, as I gather from what Mr. Garrett told me, it comes in a pipe line from the Viking field to a station in Edmonton? A. Yes.

Q. Now what pressure does it come through in from the field? A. Now on this subject I claim the ignorance of counsel. I am not an engineer.

Q. You know more about it than I do, at all events? A. No I would not give any statement as to any engineering facts at all.

Q. I do not want you as an engineer. I just want to get the fact of how that comes into the intermediate pressure main. We have it in evidence it goes through that main at a pressure of thirty-five to forty pounds to the square inch. Where is that pressure made? Is it Viking or in the shops? A. If you will keep your questions very elementary so I can answer them I will but I can tell you that much, that it comes under its natural pressure.

Q. You have not any machine that pumps it up? A. No, we do not pump it up or pump air into it.

Q. And you have to reduce the pressure? That is what Mr. Garrett tells me? A. Yes, from place to place.

Q. And one place at the city limits, and there is a place where it is reduced? A. Yes.

Q. And it is then sent into this intermediate pressure line, first of all at a pressure of some thirty to forty pounds to the square inch? A. That is correct.

Q. And it goes around the city in either a belt line or in some form

*In the
Supreme
Court of
Alberta*

Defendant's
Evidence

No. 60
Horatio
Ray Milner,
Cross-Ex-
amination
continued.

you call a belt line and from it at spots in its journey there are stations that reduce it to still more—to six ounces or four ounces? A. To four or six ounces.

Q. And then from there the gas is put into the low pressure ten inch line and it goes through that ten inch line at that pressure in order to feed our houses? That is the pressure at which it comes into our basements? A. Yes.

Q. Now you have some method, haven't you, of shutting off your gas at the city limits? A. Well it is an engineering question. I assume it could be done but it is something we never have done. 10

Q. But it is reduced at the station at the city limits to a point so far as pressure is concerned when it is put into this intermediate pressure main at the pressure you have stated. Now if you want to shut that right off for some reason of your own—suppose the gas was suddenly escaping from the intermediate pressure main at a tremendous rate all over the city and it became necessary to shut it off, couldn't you shut it off at the city limits, or where would you shut it off? A. Oh I suppose it could be done but that is a matter of engineering. You have to take care of the pressure in the main from Viking and whether you would have to cut it off at Viking I do not know, but I imagine it would be a considerable 20 problem.

Q. But you could cut it off? A. We could somewhere, at the wells if necessary.

Q. And have you any apparatuses or apparati or apparatee, whichever is the plural of apparatus?

MR. SMITH: We are out of this.

MR. WOODS: In the main it is, taking the twelve inch main throughout the whole of the city—have you any apparatus or valves or otherwise that you can segregate part of that twelve inch main, I mean shut it off with a valve on one side or at the other side so as to separate that 30 area in your twelve inch main? A. Cut off areas?

Q. Yes. A. No I could not tell you about that. I would not venture an opinion one way or the other about that.

Q. But you do not know of any? A. I would not venture an opinion. I know there are some but I do not know where they are located or anything about it.

Q. Well there are some valves that could separate off the gas in areas? A. You must understand it. I am not an engineer.

Q. I know but still we want as much information as we can. And you certainly have it or can get it. What I am getting at is this, take all 40 this twelve inch main, the main south of Jasper, say from 105th to 108th Street, have you any valves in your pipe that you could shut them down and segregate that area? A. I could not tell you, Mr. Woods.

Q. I am right in suggesting to you that if you had you would know it? A. There are a lot of things in the plant of which I know nothing.

Q. There has been evidence given here that indicates that that Corona Hotel Company was fed by gas all night and there certainly has been evidence given here that the gas company did not actually get that gas shut off so that it did not go down that way until—well they put a vent pipe up at nine o'clock in the morning and they discovered the leak at two o'clock next day. And what I am after is did you know of any contraptions in the pipe that would have enabled your company to shut that gas off during the night so as to limit the extent of that fire—valves or anything in your pipes? A. No I could not answer that question.

10 Q. You know of none at all? A. No I know of none at all.

Q. Wouldn't it be reasonable to have those kind of things in your pipe? A. For a fire such as this?

Q. Yes. A. No I would not think so.

Q. I mean to say it is quite clear that if that intermediate pressure gas main had been able to have been shut off at the time of the fire instead of the workmen having to dig down through the pavement three or four times it would save a tremendous amount of property? A. I would say that in view of the evidence here nothing in the world could have saved that building from the moment a match was struck and put
20 to any old piece of paper of anything else.

Q. If the fact is that the fire was being fed by gas all night it would have saved it being fed by gas if you had valves to shut off the gas? A. Well I do not agree that gas had anything to do with that. That the gas set it on fire is a different matter.

Q. I think the answers you gave to my friend as to the franchise is as you pleaded in your Statement of Defence? A. Yes.

Q. And you say you have the actual assignment of the agreement from the Northern Alberta Gas Development Company? A. Yes, there was one document assigning everything.

30 Q. Have you that document? A. No but I got a certified copy of it a little while ago from the Registrar of Companies where it is filed. It is also filed with the Board of Public Utilities Commissioners and with the city.

Q. And will you let me see the copy you have and if I desire to have it marked as an exhibit here it will be marked?

MR. SMITH: Yes. I told your Lordship I intended to put in some discovery. I do not think it is necessary. I am quite ready to do it, as I promised, but I think there is no concern about that.

THE COURT: Well I think Mr. Woods is agreeable?

MR. WOODS: Yes.

40

At 11:55 Court adjourns till 2:00 p.m.

At 2:00 p.m. Court resumes.

*In the
Supreme
Court of
Alberta*

—
Defendant's
Evidence

—
No. 60
Horatio
Ray Milner,
Cross-Ex-
amination
continued.

Application for Amendment to Statement of Defence.

*In the
Supreme
Court of
Alberta*

No. 61
Applica-
tion for
Amend-
ment to
Statement
of Defence
1st Feb-
ruary, 1934
continued.

MR. WOODS: Just before adjournment my friend promised to produce certified copies of a certain city by-law. I gather the intention is to ask for an amendment to the pleadings so as to admit of the introduction of this portion of the by-law and that the matter goes to the question of the damages suffered by the Motor Car Supply Company Limited, one of the plaintiffs, and I have asked the solicitor for the Motor Car Supply Company to attend with me and I understand my friends are asking for an amendment to the pleadings and I will speak to the matter when that is done, but there is nothing on the record at present that the by-law is relative to. 10

MR. SMITH: That is the situation. We intend to plead that the Motor Car Supply Company having stored certain things in their premises contrary to a city by-law that they are not entitled to so recover and I am asking leave to file the by-law and formally pleading that. It goes purely to the question of damages. Paragraph 32 of the Statement of Defence says (Reading). I do not think it is necessary to do anything more than tender the exhibit.

MR. WOODS: I understand my friend says this is the by-law he is referring to in paragraph 32? 20

MR. SMITH. Yes.

THE COURT: There is a way to prove a city by-law. I suppose you are agreeable to a copy of it going in without the proof?

MR. WOODS: Oh yes I am not objecting to that. What I had in my mind when my friend Mr. Martland told me the purpose of the matter was that I recollect a similar application was made before your Lordship in Brody vs. C.N.R. and while your Lordship admitted the by-law subject to objection I think in your judgment decided it had not any bearing on the matter. I am not consenting to any amendment. 30

THE COURT: Of course this paragraph 32 asserts that if the fire occurred it was caused by the combustion of inflammable material stored contrary to a by-law. You said, Mr. Smith, that what you were intending to do now went to damages only.

MR. SMITH: What I had in my mind was that.

THE COURT: You mean it goes to the question of your liability to the Motor Car Supply Company?

MR. SMITH: Yes. We might under some slight amendment on the question of damages—

THE COURT: But the allegation in paragraph 32 of the defence would only as I understand it be of any value to you if I came to the conclusion as a fact that the fire was caused by the combustion of inflammable material stored in the basement of the hotel beneath the Motor Car Supply Company's premises contrary to this by-law—

MR. SMITH: That is true as the pleading stands.

THE COURT: Is there any amendment you want besides that?

MR. SMITH: The amendment I was seeking was that as they stored these things the defendants are not liable for any damages to them. It was pointed out to me we had a provision in the Statement of Claim which made the by-law itself admissible and when we come to the question of damages I shall probably ask for some such amendment as I have intimated.

THE COURT: I am suggesting it is not perhaps a question of damages so much as of liability if there is anything in the suggested amendment. In other words, I want to be sure of what I am asked to decide.

MR. SMITH: It may go to the whole distance of saying that if persons do store things they cannot recover for anything.

THE COURT: Well I will admit the copy of the by-law which goes in as evidence of a by-law passed by the City of Edmonton in force at the time of the fire?

MR. SMITH: Yes.

MR. WOODS: Yes, my Lord, but I do not understand there is any application now for amendment to the pleadings.

Copy of By-law of City of Edmonton marked Exhibit 92.

THE COURT: It is put in, as I understand it now, on the pleadings as they stand?

MR. WOODS: Yes, I would think that the pleadings—I do not think my friends, that if they have any amendments to make they should plead now.

MR. SMITH: I quite agree with my friend that he should know now. I apply for amendment to the effect that because of this breach of the by-law by the Motor Car Supply Company that we are not liable.

MR. WOODS: I am not consenting to the amendment and my memory is that the decision of this Court in the Brody case shows that that is not good in law.

THE COURT: Well I will grant the amendment.

*In the
Supreme
Court of
Alberta*

—
No. 61
Applica-
tion for
Amend-
ment to
Statement
of Defence

1st Feb-
ruary, 1934
continued.

*In the
Supreme
Court of
Alberta*

No. 61

Applica-
tion for
Amend-
ment to
Statement
of Defence

1st Feb-
ruary, 1934
continued.

MR. WOODS: There is only one other thing. My friends have now handed me a copy of the agreement. I have not had a chance to read it but after reading it I will decide whether I will ask to have it marked or not.

THE COURT: I think I would like to have a copy of such formal amendment you have asked for as I want to put it with the rest. Is there anything else for the defence?

MR. SMITH: No, my Lord.

THE COURT: Is the defence closed?

MR. SMITH: Yes, my Lord.

10

No. 62.

Evidence of William Ruff (Recalled).

Plaintiffs'
Evidence
in Rebuttal.

No. 62

William
Ruff,
(recalled)
Examina-
tion.

WILLIAM RUFF being recalled, was examined by Mr. Woods and testified:

Q. You are already sworn. At some time since you have been here you were sewer foreman of the City of Edmonton? A. Yes, sir.

Q. And you have been in that position for how long? A. Some twenty-two or twenty-three years.

Q. And you have had a great deal of experience in putting down sewers in the City of Edmonton? A. Yes.

20

Q. And in earth conditions under the streets of Edmonton? A. Yes.

Q. And the action of those earth conditions upon structures above them? A. Yes.

Q. There has been evidence given by the defendants in this case concerning this six inch drain. Is it a drain? A. Yes.

Q. From the catch basin into manhole "A?" A. Yes.

Q. I do not know whether you were here when the evidence was given, but roughly speaking there has been evidence given indicating that there has been a movement of the earth under that construction both laterally and vertically? A. Yes.

30

Q. Now have you recently examined that six-inch drain? A. Yes, sir.

Q. When? A. Yesterday.

Q. Will you describe to the Court what the construction is?

MR. SMITH: At this point I am going to object to the evidence which is now being called, as not being proper rebuttal in this case. The basis upon which I put it is that the evidence now about to be called can only be confirmatory of the plaintiffs' case in chief. The position I take is

this, that we have had one thing very definitely in issue from the time the pleadings were closed and that is as to what caused this pipe to fall. The allegations in the pleadings are quite plain. We say it was caused by a subsidence at a certain point by certain reasons. My friend led certain evidence with respect to this and at the opening he said he intended to pursue that course and he did it and I say now that the evidence he now seeks to put in is nothing more than confirmatory and therefore cannot be put in as rebuttal.

10 THE COURT: I think strictly speaking you are quite right but if as I see it the plaintiffs' case had not attempted to anticipate the possible defence based upon the evidence which has been given for the defence on the subject matter about which Mr. Woods is commencing now to examine this witness, you would not have had whatever advantage there was or has been by reason of his, rightly or wrongly, opening upon it and leading evidence in support of his more or less negative evidence. Under all the circumstances I think it would be quite wrong for me to refuse to allow him to do what he is now proposing to do, although I quite agree with the proposition that you have advanced, if one were required to deal with the lawsuit upon the strict basis of what is and what is not properly speaking rebuttal. But I think I will not recede from the position
20 which I think the members of the profession generally understand that I take, to try to get at all the facts, and of course if there is any reason given why you should be given an opportunity to put something else in—there will be limits sometimes—I will see what can be done in the way of permitting you to put in other matter to throw light upon this question which is somewhat more or less—tenebrous should I say?

MR. WOODS: I will not go beyond that.

Q. Will you be good enough to tell the Court—my question was to describe to the Court what the construction of that tile drain was?

30 A. Six-inch vitrified tile with cement joints.

Q. And the vitrified tile—a piece of it — is here as Exhibit 89?
A. Yes.

Q. And you did examine down there yesterday and what did you find as a result of your examination of that tile? A. Well in my estimation—

40 THE COURT: The witness is going on to give opinion evidence. As I take it really, Mr. Buchanan's evidence was to some extent as I gather an opinion based upon observation. The two things are mixed of course. Now I suppose this is no increase of course of numbers because this witness has been called before.

MR. WOODS: I do not hesitate to say to Your Lordship that I am going to ask Mr. Ruff, with his long experience, for opinion evidence.

Q. First of all, tell us what you found according to your observa-

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence
in Rebuttal.

William
Ruff,
(recalled)
Examina-
tion.
continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence
in Rebuttal.

No. 62
William
Ruff,
(recalled)
Examina-
tion.
continued.

tion as to what, if any, movement there had been in that tile drain?
A. Well I will not say there has been any movement. The first two pipes from the manhole are on line pointing in a definite direction. The next two pipes have swung to the south and then it gradually straightens itself on the fifth pipe.

Q. When you speak of that line, it swings to the south and then comes back?
A. Yes, two pipes are going in a generally northeasterly direction and there is a slight swing to the northeast and then it comes back from the northeast but not so great as the two pipes leading out of the hole. The point I want to stress is this, if you straighten up the two pipes which are supposed to be out of line you would miss the pipe in the manhole. Continuing the line of the fifth pipe in the angle in which it is pointing you would probably miss the hole in the manhole by six inches; showing that these pipes were not laid on line in any way. 10

MR. SMITH: I am objecting to any opinion evidence being given by this witness. The objection I take is exactly the objection my friend took with regard to my own. You called Mr. Haddow and Professor Morrison and you called Mr. Underwood.

MR. WOODS: Mr. Underwood is not an opinion expert called by me. I called Mr. Ruff and I certainly put him before the Court as being a person entitled to give opinion evidence and I called Mr. Haddow and I called Professor Morrison. Those are my three opinion evidence people upon the subject of the pipe construction. 20

THE COURT: What the witness has just said, or what he started to say was factual?

MR. WOODS: Yes.

THE COURT: What he later said appeared to me to be opinion evidence. So far as the evidence is factual it does not, as far as I heard it and understand it, it does not differ from that of the observation of Dean Wilson and Mr. Cameron and Mr. Buchanan. It is difficult for me to remember at the present time whether Mr. Underwood, who was the first witness for the plaintiff, who spoke of this matter, can be said to have given at your instance, Mr. Woods, any opinion evidence. 30

MR. WOODS: I did not intend it, anyway.

THE COURT: That being so I think I will have to leave it to you to take the responsibility.

MR. WOODS: I am willing to. Of course my memory may not be as good as Your Lordship's but I am certain I never asked Mr. Underwood for opinion evidence on this subject, and I never intended to. Mr. Ruff was the first witness and Mr. Underwood was a workman under him. 40

THE COURT: I rather think you did not use him as what we sometimes speak of as an expert—a person entitled to give opinion evidence. But my memory is not such that I will make a definite ruling. Again, I say I think the proper thing for me is to leave it to you.

MR. WOODS: If there is anything in his testimony that could be construed as being opinion evidence it was contrary to my opinion and I have no recollection of calling Mr. Underwood as an expert.

Q. Now you were saying that the fact of this tile drain being in the position that you have described shows what? A. That there was no
10 movement to the north, for this reason—

Q. I understood you to say that it showed—
(Last answer read):

MR. WOODS: Laid when? What do you mean by the pipes were not laid on line in any way? A. Well during the catch basin construction. There is just two points given. That is the manhole and the position the catch basin is to go on the street. Now it is a recognized practice that we go five and one-half feet in the ground at the catch basin and if the sewer will allow it we go about eight feet down in the manhole. That is a line of two and one-half feet in the grade in about forty feet.
20 It varies according to the depth of the sewer. Now in the early days these tiles were laid by inexperienced workmen both in regard to the digging and the laying and on occasions—

MR. SMITH: Certainly this is not rebuttal. Your Lordship has intimated you will allow him to give evidence with respect to a certain line from the manhole to the catch basin. Surely that does not permit a history of the early laying of sewers in this city. And that is the evidence that is coming now.

THE COURT: I understand the witness to say that he cannot speak of what actually was done at the time that drain was put in. That is right
30 is it now?

THE WITNESS: Yes, sir.

THE COURT: But that is basing the opinion that he has already given upon certain things, one of which is something he admits he does not know anything about, as a matter of fact, but he is stating that he is acting upon his understanding of what was done previously by certain inexperienced workmen.

MR. SMITH: What I do suggest is this—I want to confine this as closely as I can to the rule. I submit that anything of this sort certainly should have come out in chief. It is true that that catch basin was not
40 mentioned until I called evidence of the fact and I anticipated Your Lordship might make the ruling you did with respect to that, but it does seem to me that is the limit to which you should go.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence
in Rebuttal.

No. 62
William
Ruff,
(recalled)
Examina-
tion.
continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence
in Rebuttal.

No. 62
William
Ruff,
(recalled)
Examina-
tion.
continued.

MR. WOODS: I suppose that can be argued when we come to something else?

THE COURT: At the moment it strikes me that the last reason rather detracts from the force of the opinion he has given.

MR. WOODS: Then so much the better for my friend.

THE COURT: Yes.

MR. WOODS: Go ahead. A. I am going back now to a number of years ago. We have put in catch basins to suit local conditions. That is they were on ungraded streets and the lanes were not properly defined and there would be a pothole and we put them in to suit conditions as they were at that time. I am not speaking of one instance but of hundreds of instances. 10

Q. Would you confine yourself to give us your reason for stating that the sewer six-inch drain was, as I understand you, originally laid in the way you say you found it? Give us as shortly as you can your reasons for saying that the six-inch drain we are talking about was originally laid with a crook in it? A. Well what I was going to explain then is the way I have known them to be laid afterwards. When I speak of local conditions, there may be a pothole here and we would put the catch basin in to suit the condition on the ground as it was at that time, no grades or nothing; the workmen put them in. When that street came to be graded and paved with curb and gutter a stake was put in where the engineer wanted the catch basin placed and when this drain was put in here we picked this line up here. 20

THE COURT: What is that? A. That is the catch basin line.

Q. Mr. Woods has been calling it a six-inch drain. A. Yes.

MR. WOODS: That is coming directly along like the gas mains? A. Yes. This was the fixed position for the curve and we would pick up this line wherever it came out of the manhole. Sometimes we would get it at an angle of forty-five degrees and we would make a bend to meet that. And we would not disturb that portion coming out of the manhole. 30

Q. So am I right in understanding your answer to me to be that you are giving this as the reasons, whether they are good reasons or not, for your idea that that six-inch tile drain when it was put to this point on the curve was put on the line in which you now find it?

THE COURT: He said his idea was it was not put to line.

MR. WOODS: What he meant by that was when it was originally built it was not built on a straight line but built in the way he has mentioned, and he is now giving his reasons for thinking that. 40

THE COURT: The only reason I interjected was because you said "built as I found it to be."

Q. MR. WOODS: Do I understand you correctly in what you have just now said to be of the opinion from your experience and observation of the way in which these catch basins are built in the City of Edmonton that the line as originally laid was laid in very much the position in which you find it now? Is that what you intended to convey, or am I wrong? A. Well I would not say that it is, under my supervision.

Q. What is your view of that? Is that what you are endeavoring
10 to convey to the Court? A. What I am endeavoring to convey is this—
from that pipe that has been laid, or whoever laid it, I don't know anything about it, there is no settlement in that pipe other than in the first pipe from the manhole.

Q. Now you are quite clear on that? A. I am quite clear on that.

Q. How much settlement is there in the first pipe in the manhole.
A. I would say, over a length of two feet, approximately one inch.

Q. In what direction—downwards? A. Yes. I do not want to say settlement. The grade—it is one inch against the grade.

Q. That is to say that coming out of the manhole the first two
20 lengths of pipe dropped downwards? A. Just one length—two feet.

Q. That the first length of pipe drops downward to the extent estimated by you as being not more than an inch? A. One inch.

Q. An inch downward? A. Yes, sir.

Q. And that that is the total extent of the settlement of that six-inch tile sewer? A. Yes, sir.

Q. Now I am going to ask you this, and do not answer until my friend has had every chance to object if he wishes to. There has been evidence led here by the defence indicating that the construction of the fifteen-inch tile drain as shown on this model and the weir chamber into
30 which it goes caused a settlement of the earth above the weir chamber and the fifteen-inch tile drain and that that settlement of the earth caused this twelve inch gas main to subside as it is shown in the evidence it has subsided. Now if that ground above the weir chamber and above the fifteen inch tile drain has subsided to the extent necessary to allow this gas main to subside what would be the effect of that subsidence on this six-inch tile drain?

MR. SMITH: Now I am objecting to this. There is not one word my friend used in his question which does not come within the definition of what is confirmatory to his case in chief. We have had evidence
40 given by all three experts and by others with respect to questions of fact about subsidence of earth, and the evidence given that there was no subsidence and so on, and I do with respect submit that they cannot take one angle of that and simply use that to go over the case again. I submit with great respect that this has gone, even with the generous inter-

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence
in Rebuttal.

—
No. 62

William
Ruff,
(recalled)
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence
in Rebuttal.

—
No. 62
William
Ruff,
(recalled)
Examina-
tion.
continued.

pretation you suggested you were going to put on counsel's attitude, I submit with great respect it has gone as far as it ought.

THE COURT: Apart from that I do not think you have qualified this witness in the way you should and as I understood you you properly insisted upon the qualification of the expert for the defence who gave expert evidence on this same matter, Dr. Wilson, and Mr. Buchanan. And then you may be allowed the field to the extent that I stopped Mr. Cameron giving his evidence on.

MR. WOODS: I thought my original questions to him this afternoon, if I did not put them in before did qualify him to give opinion evidence upon the movement of that earth as a result of his experience over twenty years in laying sewers in the City of Edmonton and in the construction above those sewers and the effect of the movement of earth upon these constructions. If that does not qualify him to give that kind of evidence it is an extraordinary thing. 10

THE COURT: The expression that was used was, I thought, a rather good one. That is the behaviour of the earth. Now I do not know whether you put him forward as one who was able to give opinion evidence as to that topic.

MR. WOODS: I will clear that up. Have you had a large experience by virtue of your position and occupation in respect of the behaviour of earth in and about and under the streets in the City of Edmonton? 20

MR. SMITH: I am raising a further objection, and it is this: My friend advised the Court he had not called Mr. Ruff as an expert on his case in chief and I am entitled to rely upon that and the qualification he then gave and I do submit again he is not entitled to qualify somebody in order that that qualification may date back to the evidence which may have been given by the witness prior to the closing of the plaintiffs' case.

THE COURT: I will hear the evidence.

THE WITNESS: Practical experience; not technical; just general knowledge of the different cavings and things of that kind and how it will affect piping. 30

Q. MR. WOODS: Under the streets of the City of Edmonton?
A. Yes.

Q. And how it will affect pipe? A. Yes.

Q. And I am asking you what would be the effect of such a settlement as has been suggested over the top of a fifteen-inch tile sewer?
A. If there was a cavity underneath the six-inch tile sewer with any pressure from above and not a great pressure at that, it would fracture and sheer off at the manhole. 40

Q. And if the effect of the settlement of the earth as suggested had the effect of breaking this twelve-inch gas main would the effect of such a settlement be upon such a construction as the six-inch tile sewer?

*In the
Supreme
Court of
Alberta*

MR. SMITH: He has already said he knows nothing about pressures. Now he is asking the witness to compare a pressure breaking one line and breaking another. I do submit that no suggestion of the expert qualifications necessary to answer such a question has been given.

Plaintiffs'
Evidence
in Rebuttal.

10 THE COURT: I think you are going rather far, Mr. Woods, but I am going to allow you to do it and in addition to that I rather think it is the kind of evidence that perhaps ought to be put in by the witness without too much suggestion. I do not say for a moment that suggestions are at all improper but I rather think perhaps the better way would be to put the witness in the box and tell him that you have asked him for an opinion upon such a thing which he has previously prepared, if you like, and give it and give his reasons either in chief or in cross-examination.

No. 62
William
Ruff,
(recalled)
Examina-
tion.
continued.

MR. WOODS: All right, I will do it that way. I have asked you for the opinion upon the influence of such a settlement of earth as is suggested, that is a settlement of earth that causes this gas main to settle upon the tile drain that we are talking about now. Now will you give
20 that opinion and give your reasons for it in extenso? A. If there is any hole or cavity here—

Q. That is where? A. That is at the weir chamber, which has been suggested which causes a fracture on the gas main, it would certainly have a bearing not only on this six-inch line but also on the eight-inch line. The eight-inch line is adjacent to the weir chamber.

THE COURT: Have you anything to suggest as to Mr. Buchanan's idea that the pipe running up and down 107th Street is outside the area of the disturbance?

MR. WOODS: I will take him over that.

30 Q. You remember that Mr. Buchanan suggested that this 107th Street sewer might be outside the area that might be affected by such a settlement as has been suggested over the weir chamber and over the fifteen-inch tile sewer? A. I would say that the eight-inch tile—we will take the eight-inch, which is nearer the cavity and which would certainly have—

MR. SMITH: Are we now going to have evidence about a new pipe concerning which I called no evidence at all? Surely we cannot do that. I mean if this goes on lawsuits are endless.

40 MR. WOODS: Well if necessary I am willing to do it and do it now and in view of the evidence led by the defence I ask for leave, if leave is necessary to put in the evidence that I am now putting in because of the fact I gave evidence in chief not in part of my own case but in anticipation of the defendants putting in evidence which was part of this case,

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence
in Rebuttal.

No. 62
William
Ruff,
(recalled)
Examina-
tion.
continued.

that I should be entitled, subject of course to the defendant being entitled to answer—to put in the whole of the evidence that rises to one's mind as a result of the evidence put in by the defence that there has been this class of a depression over that whole area and it would be contrary to the interests of justice if we are not permitted to do so.

THE COURT: I think the last reason, that you have anticipated a possible defence is the strongest thing in favor of the objection raised by Mr. Smith. But, as I said before, notwithstanding that I am going to hear the evidence.

MR. SMITH: Your Lordship will forgive me for objecting but I 10 must do it. There are rules, and I must protect myself.

THE COURT: Yes. But I take the stand that what I am doing is in the interests of justice if you like or the interests of enlightenment. So far I do not know that this witness's evidence has displaced some of the view that I have to some extent formed in my mind about the evidence given by the three experts for the other side. But that is another matter. I am going to hear it.

Q. MR. WOODS: Will you go on with your statement about the influence of such a settlement upon the over structure to which you referred? A. Well we will take the eight-inch of which the tile leading 20 into the manhole is in a fixed position, and it cannot move and there is a cavity below and any pressure exerted from above it is going to fracture and the same thing applies to a lesser extent to a six-inch, because it would not have so much to carry if there is any downward pressure of the earth and those lengths would both show evidence of fracture, which on an inspection I cannot see any evidence of fracture in either of them. I may say here now, I spoke of that first pipe being raised one inch against the grade.

MR. SMITH: That is the six-inch? A. Yes. It was impossible for that pipe to move because it is protruding some distance into the man- 30 hole and it is in solid concrete. So it is impossible for that pipe to shift unless it fractures.

MR. WOODS: Do you find any evidence of fracture in either of those pipes? A. No, sir.

Q. Now, sir, evidence has been put in by the defendants of a hole or depression of some kind underneath the pavement of 107th Street right near where this pipe broke. I am referring to the evidence of one of their witnesses who spoke of having seen a hole under that pavement into which he put his arm. I do not know how far he put it in but he put it in and I think he said he had his coat on. Now when did you inspect or see 40 that pavement after the fire? A. I think the first time was some time just after five o'clock the day after the fire and several times since that time.

Q. Now confine yourself to the day after the fire and tell us what you found upon inspection of the pavement and as to whether there were the holes or a hole under it or not? A. Well sir, I did not see any hole of any kind to the best of my knowledge.

Q. Now were you looking for that hole? A. That is the purpose I was there for.

Q. And what would you say about the evidence of the man who said he saw a hole of the character he described? A. He did not say anything about it.

10 Q. Is it correct or not according to your observation?

MR. SMITH: Well if he will tell facts.

THE COURT: Well that is a little too leading because the witness has made his answer—whatever it means.

MR. WOODS: Were you there on the 18th of June when the pipe was taken up? A. Yes, sir.

Q. Did you make any inspection on that day of whether there were any holes under the pavement? A. No, sir.

20 Q. It has been said by Dr. Wilson that the putting in of this fifteen-inch tile sewer and weir chamber as it was put in so as to—as he surmised or as he thought would be included—would cause a settlement of the earth above it. It has been stated by him that in his opinion it was not good engineering practice. Were you in charge of the putting in of that tile sewer? A. No, sir.

Q. You were not? A. No, sir.

Q. Who was it? A. That was put in by a contractor by the name of Mr. Fred Wilson.

Q. What do you find—what is your experience as sewer foreman in Edmonton of the tunnel roofs of these sewers such as that fifteen-inch tile sewer standing up.

30 MR. SMITH: Now My Lord that is the same thing.

THE COURT: Oh yes.

MR. WOODS: The point is this, and I am submitting it for Your Lordship's consideration. Evidence has been led by the defendants that it was not good engineering practice for this particular construction to be done in the way it was on account of the fact that it resulted in the subsidence. Now surely I have a right from the person who has a thoroughly good acquaintance all over the city and of the condition of the ground and streets and earth in every street in Edmonton, to give evidence to show quite apart from anything else that there was no reason whatever for
40 anybody to think that there would be any affectation of any gas main services when making that tunnel, and I am asking this witness with the experience he has deposed to, to say whether in his experience tunnels do stand up?

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence
in Rebuttal.

—
No. 62
William
Ruff,
(recalled)
Examina-
tion.
continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence
in Rebuttal.

—
No. 62
William
Ruff,
(recalled)
Examina-
tion.
continued.

THE COURT: The evidence put in by the defendants was put in with reference to this particular portion of work which they assert caused the subsidence and this witness has said that he was not in charge of that but that it was done by a contractor named Fred Wilson. Now I cannot see how it would assist at all for him to say that what was done by him, which I suppose he would say was done under good engineering practice in several parts of the city, will help us here about this particular thing done by somebody else.

MR. WOODS: Let me put the question in this way; with your experience in the City of Edmonton and your knowledge of the conditions at the corner of 107th Street and the lane south of Jasper would you say that anyone putting in that fifteen-inch tile sewer into the weir chamber had any reason to expect any sinking of the construction? 10

MR. SMITH: Once more, I must make my objection to something which is new and which should have been put in chief.

THE COURT: Apart from that—there is another thing about that. It may be evidence that cuts both ways. In view of the law about the matter that I have been turning over in my mind—I will hear the answer.

MR. WOODS: What do you say about that? A. I know nothing about the construction of that particular piece of work but I do know the nature of the soil above the weir chamber and the backfilling on the top of the weir chamber. 20

MR. SMITH: Now this was evidence which was given before by witnesses, by Mr. Underwood and by Mr. Haddow and not by this witness. Surely he is not now going to tell us questions of fact as to the existence of this weir chamber when my friend called two witnesses.

THE COURT: You will have to try to answer the question. I will have it read to you again so we will not have it altered.

(Question read): "Let me put the question in this way; with your experience in the City of Edmonton and your knowledge of the conditions at the corner of 107th Street and the lane south of Jasper would you say that anyone putting in that fifteen-inch tile sewer into the weir chamber had any reason to expect any sinking of the construction?" 30
A. No, sir.

Q. MR. WOODS: Now I understand you did sink a hole here yourself in this neighborhood? A. Yes.

Q. Whereabouts? A. I could not say definitely. It is on one of your exhibits, the one on the smoke test.

THE COURT: And has not that been canvassed several times before? I have given a rather wide concession which when I gave it I assumed would not be abused but only used. 40

MR. WOODS: Perhaps Your Lordship will hear me as to what I want to ask. There has been evidence given of Mr. Ruff having put in certain holes along that territory and there is evidence given in connection with making the smoke test. What I am frankly going to ask the witness now is in connection with one of the holes when he went out into the hole did he find any evidence of the settlement of the ground at that place in the vicinity of this. It is one of these holes that was put in for the purpose of the smoke test and that is why it happens to be on one of the exhibits.

*In the
Supreme
Court of
Alberta*
—
Plaintiffs'
Evidence
in Rebuttal.
—
No. 62
William
Ruff,
(recalled)
Examina-
tion.
continued.

10 MR. SMITH: Evidence has been led by my friend in his case in chief, not only applicable to the third party, but on his case against us as to evidence of the soil conditions, and I do submit he cannot now come back and simply add to a subject upon which he has already led evidence by experts.

THE COURT: I quite agree with you but I am going to allow him to do it.

MR. WOODS: The hole I have reference to—

THE COURT: Did you find when you made these holes for the purpose of the smoke test any evidence of—

20 MR. WOODS: I would rather put it in this way—what was the condition of the soil in those holes as to settlement? A. There was absolutely no sign of settlement. There was no separation of the earth from the pavement or any sign of break whatever.

MR. SMITH: This came before I had the opportunity to object and I take it my objection will be noted with respect to the answer which has just been given.

THE COURT: I may repent of my concession. I hope not.

MR. WOODS: I fancy if my friend objects right along it may be awkward for me and I will have to submit to the Court.

30 Q. How close was the nearest of those holes to the break? A. I would say ten or twelve feet east of manhole "A."

MR. SMITH: I raise an objection if we are going to have evidence of this which is easily ascertainable we should not have guesses at this stage.

MR. WOODS: How deep was the hole? A. Six feet eight inches. We went through the frost and this hole is what I called No. 2 when I gave evidence on the smoke test.

Q. You can identify that on the plan. A. Yes, sir.

Q. You were down in the hole yourself? A. Yes.

40 MR. SMITH: Since all the evidence given by this witness has been given subject to my objection I do not intend to endanger my rights by indulging in any cross-examination.

No. 63.

Evidence of Albert Walter Haddow (Recalled).

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence
in Rebuttal.

No. 63
Albert
Walter
Haddow,
(recalled)
Examina-
tion.

ALBERT W. HADDOW, (recalled), was examined by Mr. Woods and testified:

Q. You were already sworn, and the first matter I propose to take up with you is this matter I asked Mr. Ruff about with regard to this six-inch tile drain to the catch basin. Have you seen it? A. Yes, I saw it this morning.

Q. Will you describe it?

MR. SMITH: I may merely mention I object? 10

THE COURT: I will allow Mr. Haddow's evidence to be put in as far as any facts are concerned. That is as to any observation he has made. If he is going to re-open this whole question again of Mr. Haddow's previous evidence I am going to take time to consider it.

MR. WOODS: We will get through the questions of fact first.

Q. What did you find? A. Referring to the model I went down into manhole "A" and examined the six inch catch basin—running into the northeast catch basin. The wall of manhole "A" is monolithic concrete and the tile pipe leading to the catch basin had been shoved right through this concrete wall and was protruding on the inside about two and one-half inches, and had been re-cemented—re-concreted—into the hole. The first pipe went out through the manhole and in relation to the second pipe, that is each of these pipes, as referred to in Exhibit 89, were joined together and there was a sag about the joint of between one-half and three-quarters of an inch which was very readily measureable this morning when I saw it because there was water standing in the invert of the pipe and that was the depth by which I measured that point. Extending on in the pipes the succeeding three or four lengths of pipe rose with a rather rising grade and swung to the right which would be to the southeast in direction. I should say this— 20
30

THE COURT: Now do not give any opinion. Just state what you saw, not what you thought you saw, your opinions, for the moment? A. I was just adding that I made this examination with a strong flashlight. The flashlight enabled me to see quite plainly along this catch basin lead easily for a distance of twenty-five feet I would say. With regard to the line I lined up the left hand side of the catch basin lead and I should say that it had off-set to the southeast of between four and six inches; that is the lead swing leaving the manhole, the lead swing to the south from four to six inches and then straightened out to the catch basin lead—what you would call an off-set curve. I observed no fractures whatever in the catch basin lead as far as my examination could ascertain. 40

Q. Did you examine also the 107th Street eight inch sewer going north and south this morning? A. I examined the north and south—

Q. MR. SMITH: I must repeat my objection for the additional reason that this particular sewer is something that was never even mentioned by me or any of the witnesses for the defence, and with that additional reason I submit it is inadmissible evidence.

THE COURT: I think you ought not to go into it but I am going to permit this part of it to be done.

MR. WOODS: As to the facts about 107th Street?

10 THE COURT: Yes.

Q. MR. WOODS: Tell what you found. A. I examined the north and south 107th Street sewer which is an eight inch vitrified tile passing through manhole "A" and I found absolutely no evidence of displacement or fracture of that line. My examination extended by flashlight for a distance of twenty-five feet north and south of the manhole "A" and it was even more readily discernible because of the flow of water in the sewer which was about a matter of two inches deep at the time.

20 Q. Before you answer this question—do not answer it until his Lordship says you may. There has been evidence given here, as you heard, of the fact, or evidence leading to a theory at all events or a suggestion, that about the weir chamber and the fifteen inch tile sewer the earth has settled down causing the twelve inch main to settle as we have in evidence that it did subside and fracture. Now I am asking you whether, as an engineer and knowing the conditions in Edmonton and knowing the soils and movements of earth, as an expert, whether in your opinion it is possible that such a movement of the earth took place as it is suggested, having regard to the condition in which you found first of all the six inch main? Do not answer that.

30 MR. SMITH: I am objecting to the answer. It is nothing more than a repetition of the evidence in chief, and a further point—

THE COURT: I think it would be entirely improper for me to permit you to go over all this again with Mr. Haddow and if you are calling Professor Morrison I would probably say the same thing.

40 MR. WOODS: I want it clear that I propose to call Mr. Haddow and Mr. Morrison, after having examined this construction my friend gave evidence about that it moved both sideway and up and down, and I am asking this gentleman to say how they found it and to say also whether in their opinion it is possible that the subsidence which has been given or suggested in the evidence of the defendants could have taken place and these things remain unfractured. Now if that is not

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence
in Rebuttal.

No. 63
Albert
Walter
Haddow,
(recalled)
Examina-
tion.
continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence
in Rebuttal.

No. 63

Albert
Walter
Haddow,
(recalled)
Examina-
tion.
continued.

to be given—I submit very strongly there is nothing in the fact that I put in without the necessity of putting it in, not on my own case—he gave the evidence I think in chief—from the City's officers who gave the evidence that was then available to me—I did not know whether that evidence would be available to me afterwards. They are not my clients and in anticipation of some suggestion in the absence of any evidence of the defence based on the conditions of these structures I did lead the evidence I did.

THE COURT: I think I can assume that their answer will be that in their opinion that this theory or opinion put forward by the experts 10 for the defence could not be sound because, they say, there would have been a fracture of either of these things you mention.

MR. WOODS: The fact of these things not being fractured, in my submission to the Court and the evidence that I will lead, is practically conclusive on the subject and I want to have the evidence before the Court that I am instructed will be given on the subject. Now that is the position—If because of the fact that I led evidence as I did in the opening to prevent the putting in of enlightening evidence of that character I do submit it is a thing that ought to be carefully considered because certainly we had not any way of anticipating that there would be the 20 suggestion seriously put forward of the character that was put forward in the defence backed up by reference to this very six inch tile sewer, apart from anything else, and I do submit I should be allowed to put that evidence before the court. It is not re-opening anything. It is simply saying "there it is and there is the position and it could not have happened if that theory is correct." I was not made aware of it. As a matter of fact it is one of these things that occurs to one in the last stages of the case. As a matter of fact it never was suggested to me until last night after the adjournment and then it occurred to my own 30 intelligence that it was very important evidence to put before the Court and I am asking your Lordship to let me put it before the court. It is the kind of case where we have experts on subjects. They may overlook things.

THE COURT: I will let you put the general question involved in what you have said and take the answer that I assume will be given; it may be that their opinion or the opinion advanced by the defence is in the opinion of this witness impossible at the six inch catch basin drain and the 107th Street sewer at or near manhole "A".

A. THE WITNESS: The north and south 107th Street sewer man- 40 hole "A".

THE COURT: I am willing to hear the answer to that.

MR. SMITH: I am sorry. But my friend stated to you just now, the reason he cannot do this. He said he had called these persons and

this reasoning did not occur to him, but it occurred to him since adjournment last evening.

MR. WOODS: It is not so.

THE COURT: I am going to limit the question and answer as I have said. Now, Mr. Haddow, you can state categorically what I have said you may do if you want to.

MR. WOODS: His Lordship has said he is willing to receive an answer to this question. Does the condition that you find and that you have given evidence of, of the six inch tile drain to the catch basin and
10 of the 107th Street north and south sewer, in your opinion, preclude the possibility of the settlement of the earth above the weir chamber and the fifteen inch tile sewer as has been suggested by the witnesses for the defence? A. It most certainly does. The fact that those are intact.

Q. Now I am quite willing to have the witness explain that answer if your Lordship does not stop me. Will your Lordship permit me to make clear to the witness that what I am referring to is the evidence which has been led suggests that this settlement of the ground was a settlement of the ground that caused the main to break by sinking, as
20 we have it in evidence? A. Yes.

Q. Now did you make an examination of the condition under the pavement on 107th Street on the day following the fire? A. Yes.

Q. For what purpose?

MR. SMITH: With great respect, I am objecting again to this being given. We have already had evidence led as to the condition of that pavement, photographs taken and all that sort of thing in the case in chief.

THE COURT: It was all put in before.

MR. WOODS: I want to give evidence in rebuttal of the state-
30 ment made by the two workmen as to the hole in the pavement and that is what this evidence is directed to. The first witness is called by the defence. There were two men and one of them, if not both, spoke of noticing a hole under the pavement at 107th Street when they were digging up for the break and Professor Cameron said that was one of his reasons for assuming or thinking that there had been a sinking of the ground. Now this witness, Mr. Haddow, examined it and I am asking him if he examined that condition that very day these men were there working. It is not rebuttal of their evidence?

THE COURT: All right. As to that part of it you may go on.

40 Q. MR. WOODS: Did you make an examination under the pavement? A. Yes. I examined the cut at the gas leak about five o'clock

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence
in Rebuttal.

No. 63

Albert
Walter
Haddow,
(recalled)
Examina-
tion.

continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence
in Rebuttal.

No. 63

Albert
Walter
Haddow,
(recalled)
Examina-
tion.
continued.

—in the evening of the Monday the day following the fire. I found no cavity whatever between the pavement and the sub-grade.

Q. Did you on that occasion observe to what extent the soil underneath the break—whether there was a hole underneath the break in the pipe? A. Yes, my recollection is that the sub-grade was distant twelve or fifteen inches from the beginning of the pipe.

Q. The sub-grade? A. The bottom of the excavation at that time.

Q. Was twelve to fifteen inches? A. The gas was spitting against it and displacing the side of the excavation with little spits of dirt.

Q. Evidence has been given for the defendant by Dr. Wilson that it was bad engineering practice for the City to dig this fifteen inch tile sewer to the weir chamber in the way it was dug without supporting the gas pipe. 10

MR. SMITH: I take the same objection.

THE COURT: I think you have already covered that in chief but you may give it again. I suppose he would say in his opinion it was good engineering practice.

MR. WOODS: Well I want to know what reason. Had the City any reason to anticipate any subsidence of that? A. It is what we have done all over this city and it is what I would do again. 20

MR. SMITH: Now he could have answered very simply.

A. Yes, it is good engineering practice.

MR. WOODS: Do you know how long the work in connection with that tile drain and weir chamber—how long it took?

MR. SMITH: We have evidence of that in chief, my Lord.

MR. WOODS: Perhaps you can give it to me.

MR. SMITH: I cannot remember it. 30

Q. MR. WOODS: How long did it last?

THE COURT: I do not think we have the actual dates. One witness spoke of it being in the spring and I think it will be wise to clear it up.

MR. WOODS: How long did it take to do that work? A. The work was completed in May 1931 and I think it lasted in its entirety, that would be for about a month. The first operation would be the burning of the frost at manhole "B".

Q. THE COURT: Can you get the exact dates? A. Yes, I can.

MR. WOODS: It finished up in May 1931? A. Yes. 40

Q. And it started about a month previously? A. Yes.

Q. The work did not go on continuously? A. No, the burning started at manhole "B" and there were interruptions.

Q. Was it work going on during the day? A. The contract was going on continuously; three shifts night and day but not at this particular place.

THE COURT: Is that Fred Wilson's contract? A. Yes, sir.

MR. SMITH: I will consent to a statement if filed.

MR. WOODS: Now evidence has been given by Dr. Wilson and also by Dr. Cameron to the effect that if the ground sinks above the—
 10 at the weir chamber and above the fifteen inch tile grade that the settlement of the ground above would take a form not vertical with the surface but as has been put in a fan shaped method, that is to say, spreading out towards the top. Dr. Wilson put something of an estimate he took from his railway grading experience of about forty-five degrees—or one and a quarter to one. Now what do you say as to that having regard to your experience with the way in which ground sinks?
 A. It is new to me as far as tunnel construction goes as between "A" and "B". It would not go out that way at all. If an open cut excavation were made and there were movement it would go out.

20 Q. I am speaking of a tunnel such as we have. A. No, it does not.

Q. And if the ground sank? A. If the ground sank there it would sink by the roof caving in or if there were large openings such as you get in mining by a crushing down of a pillar, but you would not get that type of subsidence under those conditions at manhole "A"—impossible.

Q. THE COURT: You do not suggest that all forms of subsidence go down vertically? A. I do, certainly under those conditions.

Q. MR. WOODS: The roof— A. In a tunnel construction if subsidence took place under those conditions, in my opinion it would do so by the caving of the roof, running to the top.

30 Q. And what do you find as your experience with the tunnels—the roofs of the tunnel, such as the roof of a tunnel that would be made in this construction, standing up? A. The roof of that tunnel would stand there for twenty years.

MR. SMITH: I again object on the additional ground—here is a question "such as might be expected on the tunnel in question."

THE COURT: Yes. It is covered by the other ruling with regard to Mr. Buchanan.

MR. WOODS: It is quite a different position in this question. My friends have chosen to say that the City showed bad engineering practice. If they had every reason to expect that tunnel roof would stand
 40 up they had no reason to support it and I am asking him whether he

*In the
Supreme
Court of
Alberta*

—
Plaintiffs'
Evidence
in Rebuttal

—
No. 63
Albert
Walter
Haddow,
(recalled)
Examina-
tion.
continued.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence
in Rebuttal.

No. 63

Albert
Walter
Haddow,
(recalled)
Examina-
tion.

continued.

had any reason whatever to suspect that the roof of this tunnel would not stand up, and I submit that is in a different category from the question my friend asked Mr. Buchanan, the contractor in Edmonton, about the cuttings of other sewers. If my friend had not led that evidence I think I might be within the objection I took this morning. But you say the City is called upon in view of that evidence to justify it.

THE COURT: I suppose you will agree that the witness would say that if there was reason to anticipate such things to occur it was bad engineering practice to bring it about? If, as he says, this thing did not happen his opinion would be as I understand him that it was not to be anticipated. However, I will hear it. Go on. 10

MR. WOODS: It is quite true that the evidence given is that it did not happen. But suppose your Lordship came to the conclusion it did happen. Did it happen by reason of bad engineering practice?

THE COURT: All right. I quite agree that if you are answering the evidence given for the defence as to bad engineering practice you are right and it is properly rebuttal evidence.

MR. WOODS: You have already told us that you are quite clear it was not bad engineering practice not to support the gas main? A. I did it in our best engineering judgment. 20

Q. Has the tendency of the roof settlement or the expectation you had of the tunnel standing up anything to do with the fact that you would have any reason to expect subsidence? A. The roof standing up and the backfilling we did between the pipe and the tunnel and the weir chamber and the tunnel.

Q. What was the backfilling you did between the pipe and the tunnel?

MR. SMITH: Oh my Lord, that was altogether—

MR. WOODS: Did you have any reason to consider it necessary at all to support this twelve inch gas main by reason of anticipating that it might sink from either the earth dropping down due to cavities or from shrinkage of the earth due to drainage or from the carrying away of earth due to the cracks in the soil? A. No. I have no hesitation at all with eight foot of ground above the excavation to anticipate any settlement of the gas main. 30

MR. SMITH: I do not stand up, sir. I take it that was subject to my objection?

THE COURT: I suppose it follows the defendant had no reason to anticipate such a result.

MR. SMITH: We seem to be in the same position. 40

MR. WOODS: Now there is evidence given suggesting that this impression of the twelve inch pipe that you saw in the trench on the 18th of June I think it was, and you walked along and you mentioned about, I forget the term— A. I think we called it a pressure ridge.

Q. It has been suggested by the defendants that you did not see what was a pressure ridge at all but it might very well be that you saw some other mark that might be made in the taking up of the pipe.

MR. SMITH: Surely there is a limit to everything, my Lord.

THE COURT: There is.

10 MR. SMITH: My Lord, as far as all the evidence given by this witness was subject to my objection I have no intention of endangering my position by cross-examination.

*In the
Supreme
Court of
Alberta*

—
Plaintiffs'
Evidence
in Rebuttal.

—
No. 63

Albert
Walter
Haddow,
(recalled)
Examina-
tion.

continued.

No. 64.

Evidence of Ibrahim F. Morrison (recalled).

I. F. MORRISON, being recalled, was examined by Mr. Woods and testified:

Q. You are still under oath, of course. You heard or were in Court when Mr. Ewertz gave his testimony? A. Yes.

20 Q. And you heard the theory he advanced as to the insufficiency I would take it, of the test which you made on those welds which resulted in your giving the weld metal the strength you mentioned in chief. Now what have you to say about Mr. Ewertz's criticism of your statement-in-chief?

MR. SMITH: Mr. Ewertz made no criticism. He said the method adopted by the University was the method used for pulling flat plates and he then pointed out there was some difference in pulling curved substances and parts of pipe and all this, merely to arrive at the strength of this weld metal. My friend has gone into the strength of that weld metal completely, in chief, and what he does now must be nothing more
30 than confirmatory of what he then sought to do, and I object to this question.

THE COURT: What do you want to do now?

MR. WOODS: Mr. Morrison gave the breaking strength of the weld metal in his evidence-in-chief at what? A. Twenty-nine thousand, one hundred per square inch.

Q. Mr. Ewertz by his evidence and the method that he adopted in pointing out what he regarded as a weakness of the test brought that strength up to what? Do you remember? A. I do not recall it.

No. 64
Ibrahim F.
Morrison,
(recalled)
Examina-
tion.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence
in Rebuttal.

No. 64
Ibrahim F.
Morrison,
(recalled)
Examina-
tion.
continued.

Q. Up, at all events, to some higher figure. And I am asking Mr. Morrison whether, having heard that evidence, he has anything to say to the court about the validity of Mr. Ewertz's criticism upon the way in which he took his—

THE COURT: Oh, I think that is properly rebuttal.

MR. WOODS: What do you say about that? A. I am going to explain what I understand is the difference between Mr. Ewertz's method and the method that was used in making the test which I have already mentioned. I am simply using this as an illustration; that is all. This is the type of coupon that was used in the test. Now, Mr. Ewertz told us, as I understand it, that when a specimen of this type having a weld on one side and coming out here like that was pulled apart, that on account of the eccentricity of the load at this point due to the extra metal on one side that there was a tendency for this or a specimen of this type to break in that fashion. Now that would be true if the grips in the testing machine were of the flexible type. Sometimes there are testing machines that permit movements of this sort. If that type of machine is used then in order to get a fair test it would be necessary to put a strip on here with clamps as Mr. Ewertz did in his test, as I understand it. On the other hand, the testing machine we have at the University is of a rigid grip type. The grips are very large, two wedge shaped clips coming down and gripping this firmly. The result is that we do not get a bending action. The grips are so large and heavy they prevent that sort of thing. If that action took place I should expect to find some bending here on the specimen (indicating). This specimen which has already been used here but not yet marked is one of the specimens I had made by a welder in town to see if this pipe could be welded and it has been tested by our method and I find it is perfectly straight, I think this is proof of the fact that the grips were capable of holding the thing straight. As I understand it, Mr. Ewertz arrived at his value by testing some pieces comparatively two ways, one with backing and one without. Nothing was said about whether flexible grips were used or not. Modern testing machines have that kind of grip of course. And he got an increase of thirty per cent. over and above the specimen tested without the backing. Now I understand that he arrived at the figure that he gave by taking 29,100 pounds per square inch and adding to that something close to thirty per cent. I do not think it was exactly thirty per cent. but something close to it. And using that figure he gets an efficiency of sixty-eight and one-half per cent. as against mine of fifty-one in the one case and fifty-three in the other. I think that explains the difference between the two methods.

Q. Do you think his test is valid having regard to the manner—
A. Well my feeling is perhaps Mr. Ewertz did not understand we had these rigid clamps.

THE COURT: I think Mr. Ewertz should have had that put up to him.

MR. WOODS: Well I think he was asked that, about the grips and everything.

MR. SMITH: He was asked that but not about the flexibility.

MR. WOODS: Another thing Mr. Ewertz said was in connection with this stress concentration. He said the increased breaking power of a piece of weld with a notch in it causing stress concentration would be fifteen per cent. less than it would be without a notch. That is what I
10 understood his evidence to amount to. What have you to say to that?
A. The subject of stress concentration is in no way related.

MR. SMITH: This is something which Professor Morrison went into in more detail in his examination-in-chief than any witness who was called and he even gave us the figures and his reason. I remember it was three he selected. Surely we are at the end of that discussion, otherwise it becomes endless. I remember the evidence the professor gave on this subject.

THE COURT: How far do you want to go?

MR. WOODS: I just want to state whether—if he knows what it
20 is, why Mr. Ewertz in his view is entirely off with regard to that rise.

THE COURT: This is all expert evidence and I think this witness did go very fully into the whole question.

MR. WOODS: Now evidence has been given by Professor Cameron and Professor Wilson as to ground settling as they described it in connection with this theory in a way what I have called a fan shaped way. What do you say about that in connection with the kind of soils that we are dealing with here?

MR. SMITH: I suppose subject to my objection.

THE COURT: I suppose if we are going to have a difference of
30 opinion between the Professor of Applied Science and the Professor of Engineering we might as well have it.

MR. WOODS: How does ground of the character described here settle when there has been a subsidence of it by reason of it settling down? A. Well the process of settlement when a narrow tunnel or hole is made in the ground is usually by a falling in of the roof and the line of fracture goes straight upwards. I have actually observed that in practice and also I have given it quite a bit of attention because it happens to be one of the subjects that I teach.

MR. SMITH: Now I am objecting to Professor Morrison re-quali-
40 fying himself. He has answered the question and we do not need any more.

*In the
Supreme
Court of
Alberta*

Plaintiffs'
Evidence
in Rebuttal.

No. 64
Ibrahim F.
Morrison,
(recalled)
Examina-
tion.
continued.

*In the
Supreme
Court of
Alberta*

THE COURT: When making the reference Mr. Woods made with regard to subjects, perhaps you had better not do it. Just answer the question.

Plaintiffs'
Evidence
in Rebuttal.

No. 64
Ibrahim F.
Morrison,
(recalled)
Examina-
tion.
continued.

MR. WOODS: How would you say the earth behaves when it is subsiding, as it is claimed it subsided here, and having regard to the evidence given that the subsidence would extend outward after starting at the bottom? A. In my opinion there is no slip on planes diverting upwards from the tunnel. The earth has a tendency to arch over and prevent such slipping.

Q. Now you did examine this morning along with the City Engineer 10 the six inch pipe tile going to the catch basin? A. Yes, sir.

Q. And also the 107th Street sewer north and south? A. Yes.

Q. Will you tell what you found?

MR. SMITH: Subject to the same objection I made with regard to the other witnesses.

THE COURT: Just make your evidence factual and do not give opinions.

A. I refer to Exhibit 30. I observed this morning from looking from manhole "A" with a flashlight into the catch basin lead which extends northeast from the manhole—I observed the first pipe which 20 comes into the manhole chamber was solidly cemented in to the wall of manhole "A". That pipe was straight, not fractured or broken in any way. The second pipe was in a line with the first pipe and also not fractured. After that the catch basin lead seemed to have a slight curve to the south. I did not make any measurements of the curve nor did I attempt to estimate the curve but it was not a great curve. It might be something of the order of four to six inches. That would be my estimate of it. There was a small amount of water standing in the bottom of the pipe close to manhole "A". That was the only place I 30 could see where there was any portion of the bottom of the pipe, that is entry of the pipe below the horizontal. That is in a curve extending below the horizontal. That spot there had a small pool of water in it and its top would be level. Mr. Haddow put his finger in that and estimated and it was about three-quarters of an inch in depth so the bow downwards seemed to be not more than three-quarters of an inch in that pipe. In regard to that eight inch sewer running north and south along 107th Street I examined that also looking north and also looking south. I found that sewer to be very straight, no tiles fractured and no curve of any sort extending either way as far as I could see, which I should estimate it was probably twenty or twenty-five feet. 40

Q. MR. WOODS: Now do not answer this question until I have leave to have your answer given. Having regard to the condition in which you found those services and having regard to their position in

reference to the place of this break in the gas main and in reference to the top of the weir chamber and the fifteen inch tile sewer. What would you say as to the possibility of those services being in the condition in which you found them if in fact the ground has settled as alleged in the suggestion made by Dr. Wilson and Professor Cameron?

MR. SMITH: Subject to my objection.

THE COURT: You have heard the question and you can just answer it.

A. If there had been a six inch settlement caused—

10 THE COURT: Now please answer.

Q. MR. WOODS: What would you say as to the possibility of the settlement that is suggested to have happened, that settlement being the settlement as given in evidence of this twelve inch gas main—the possibility of that settlement being caused by the subsidence as is suggested. Is that possible having regard to the condition in which you found those services this morning? A. No, sir.

MR. SMITH: For reasons previously given there will be no cross-examination of Professor Morrison.

20 MR. WOODS: That is the rebuttal, my Lord. I will look for that agreement and Mr. Haddow has to get the dates of construction.

Court adjourns till 10:00 a.m.

Friday, February 2nd, 1934.

10:00 a.m. Friday, February 2nd, 1934,

Court resumes.

Bill of Sale, Natural Gas and Development Co., Ltd., and Northwestern Utilities, marked Exhibit 92A.

Plan shewing progress of work on 1931 Storm Relief Sewer and two letters of City Engineer, marked Exhibit 93.

Argument.

30 At 12:30 Court adjourns till 2:00 p.m.

At 2:00 p.m. Court resumes.

Argument continued.

Judgment reserved.

*In the
Supreme
Court of
Alberta*

—
Plaintiffs'
Evidence
in Rebuttal.

—
No. 64
Ibrahim F.
Morrison,
(recalled)
Examina-
tion.
continued.

Formal Judgment.

BEFORE THE HONOURABLE MR. JUSTICE FORD:
TUESDAY, THE TWENTY-SEVENTH DAY OF
FEBRUARY, A.D. 1934.

No. 65
Formal
Judgment
27th Feb-
ruary, 1934.

THIS ACTION coming on for trial in the presence of Counsel for all parties on the 15th, 16th, 17th, 18th, 19th, 22nd, 23rd, 24th, 25th, 26th, 29th, 30th and 31st days of January, and on the 1st and 2nd days of February, A.D., 1934, upon hearing the evidence adduced and what was alleged by counsel aforesaid, and the Judgment having been reserved until 10 this day and coming on this day for Judgment.

THIS COURT DOTH ORDER AND ADJUDGE that the action be and the same is hereby dismissed with costs to be paid by the Plaintiffs to the Defendant to be taxed on Double Column 5 of Schedule C of the Rules relating to costs, including the Examinations for Discovery.

Entered this 20th day of
April, A.D. 1934.

(Sgd.) FRANK FORD, J.

“R. P. Wallace,”
C.S.C.

“Approved as to form,
“Woods, Field, Craig & Hyndman
“for Plaintiffs.”

Reasons for Judgment.

No. 66
Reasons for
Judgment.
27th Feb-
ruary, 1934.

On February 21st, 1932, a fire broke out in the basement of the Corona Hotel in the City of Edmonton which burned down the hotel building and caused considerable other damage. The fire was caused by the igniting of a mixture of natural gas and air. The natural gas was that of Northwestern Utilities Limited, the defendant, and had escaped from that company's twelve inch Intermediate Pressure Gas Main through a break in a welded joint in the main in the middle of the intersection of 107th Street and the lane in the rear of the Corona Hotel, the gas finding a channel through and along an eight inch by twelve inch wooden box containing the City of Edmonton's street railway electric return cables, and finding a way through the soil in the rear of the hotel and through openings in the walls thereof. 30

The following dates are of importance. The trenches for the twelve inch Intermediate Pressure Gas Main and the ten inch Low Pressure Gas Main adjacent thereto were dug and the pipes installed in the year 1923. The conduit for the street railway return cables was constructed in the year 1926. The city's twelve inch tile overflow sewer between manhole “A” and manhole “B” and the weir chamber at manhole “A” were con-

structed in the year 1931 the work being completed in April 1931. The break through which the gas leaked occurred in all probability on the day of the fire, the 21st of February 1932.

The case for the plaintiffs is put upon two alternative grounds (1) negligence and (2) liability without proof of negligence.

I am asked to decide the question of liability before entering upon or giving directions as to the ascertainment of the amounts to which all or any of the plaintiffs may be entitled if the defendant is liable for the injury and damage alleged.

- 10 The determinate conclusion at which I have arrived after hearing the evidence given during the trial lasting three weeks, and the material contained in the plan showing the progress of the work on the 1931 storm relief sewer and the two letters of the Engineer of the City of Edmonton furnished me since the hearing by arrangement between counsel (which I have directed are to be marked as Exhibit 93) is that the plaintiffs' claim based upon negligence fails. The evidence satisfies me that the defendant was not negligent in any respect as alleged. On the contrary I am convinced that the cause of the break in the welded joint through
- 20 constructing the twelve-inch tile overflow sewer between manhole "A" and manhole "B" and the weir chamber at manhole "A" in the year 1931. I am convinced also that no negligence is to be imputed to the defendant in not anticipating and guarding against the injurious effect of the City's operations.

After an exhaustive consideration of the cases and authorities, most of which were referred to me in the three excellent arguments of counsel of which I have had the advantage, I am of the opinion that there is no liability in the defendant aside from negligence.

- 30 I do not, however, agree with the argument advanced on behalf of the defendant that the provisions of The Water, Gas, Electric and Telephone Companies Act dealt with by the Appellate Division of the Court in Raffan vs. Canadian Natural Gas, etc., Co., 7 A.L.R. 459, and by the Supreme Court of Canada, 8 W.W.R. 676, do not apply to the defendant company.

The statutory authority of the defendant is, therefore to be treated by me as limited by the terms of what is now section 13 of chapter 168 of the Revised Statutes of Alberta which reads as follows:

- 40 "13. The company shall locate and construct its gas or water works or electric or telephone system and all apparatus and appurtenances thereto appertaining or therewith connected and wheresoever situated so as not to endanger the public health or safety."

There is underlying and implicit in all the judgments delivered in the Raffan case, with the exception of that of Idington J., the recognition of

*In the
Supreme
Court of
Alberta*

No. 66
Reasons for
Judgment.
27th Feb-
ruary, 1934.
continued.

*In the
Supreme
Court of
Alberta*

No. 66

Reasons for
Judgment.
27th Feb-
ruary, 1934
continued.

the proposition of law that were it not for this limitation of the statutory authority of the defendant in that case it would not be liable without proof of negligence. This proposition is equally, if not with greater force, applicable to the present defendant.

It seems to me clear also that the Raffan decision does not go the length of deciding that because danger to the public safety has ensued it must be taken that the defendant loses its statutory protection. If this were so the only reason for the order for a new trial on the facts which appeared in the Raffan case would have been to have the question of contributory negligence put more clearly to the jury. The main, though not the sole, question to be determined on the new trial was whether the defendant had or had not complied with what is now section 13. At p. 464 of 7 A.L.R. Harvey C.J. said: 10

“Whether the defendant has exceeded its statutory authority by reason of the terms of section 11 (now 13) is a question of fact to be determined by the jury under proper directions from the Court and a new trial will be necessary to determine that.”

Furthermore, I take it that the portion of the language of the Chief Justice, quoted by Davies, J. at p. 680 at 8 W.W.R. was intended to go no farther than to say that the fact that “danger to the public safety has ensued . . . since they did not prevent it” was prima facie evidence that the section had not been complied with. This is apparent from the earlier part of his judgment where the Chief Justice said (p. 462): 20

“Appellant’s counsel contends that the defendant . . . by not controlling its gas within its pipes so that it escaped in the manner shown by the evidence created a nuisance. It may be that what would endanger the public health or safety would be a nuisance, in some cases at least, but what is material here is not whether it is a nuisance, but whether it endangers the public health or safety.”

In the Supreme Court of Canada Fitzpatrick, C.J., referring to the facts in the Raffan case said (8 W.W.R. p. 679): “The facts of this case are quite exceptional. The company laid their gas mains under the public streets of the city in close proximity to the electric light ‘conduit,’ which is the property of and is operated by the Municipality. The accident to the plaintiff was not an isolated occurrence. Gas had escaped from the mains and got into the ‘conduit’ for several weeks before the occurrence complained of, offensive odors resulted, accidents happened, and numerous complaints were made to the municipal authorities.” 30

The only reason, other than that of the compliance or non-compliance with the defendant’s statutory authority, given in any of the judgments, for the new trial ordered in the Raffan case, is that the question of the plaintiffs’ contributory negligence, or whether, as the present Chief Justice of Canada thought, he had “by his own negligence been the direct and 40

effective cause of the explosion to which his injuries are due," had not been satisfactorily dealt with at the trial. No suggestion appears to have been made that the facts would bring the case within any of the other exceptions to or limitations of the rule in *Rylands vs. Fletcher*, such as "vis major," the "Act of God" or "the act of a stranger."

*In the
Supreme
Court of
Alberta*

—
No. 66
Reasons for
Judgment.
27th Feb-
ruary, 1934.
continued.

It is therefore necessary for me to decide this very difficult question of mixed law and fact and to say whether (to use the words of the section), "the company located and constructed its works," etc., and maintained them (to apply the decision in the *Raffan* case), "so as not to endanger the public health or safety;" or, in the words of *Harvey, C.J.*, "Whether the defendant exceeded its statutory authority by reason of section 11" (now 13). If the proper conclusion is that it has not exceeded its statutory authority, it is liable only if, applying the law of negligence to the facts it should be held liable.

Gas distribution systems are always potentially dangerous, and special care must be exercised in all respects in relation to them, but if the learned judges who ordered the new trial in the *Raffan* case intended to give such a construction to the terms of the defendant's statutory authority as would make it practicably impossible that the defence of statutory authority would ever be available, as relieving from liability without proof of negligence, they doubtless would have said so and not left open for determination, on a new trial, a question which would involve an attempt to prove the impossible. While they applied the reasoning in *Midwood vs. Manchester* (1905) 2 K.B. 597, and *Charing Cross Electric Supply Co. vs. Hydraulic Power Co.* (1914) 3 K.B. 722, in holding that section 13 was a limitation of the defendant's statutory authority, which must be complied with, they never intended to and did not give the section the effect of the "nuisance clause" dealt with in those cases. Nor was it intended to give the section the force given to the statutes dealt with in *Great West Railway Company vs. Owners of S.S. "Mostyn"* (1928) A.C. 57, and in *Hull vs. Toronto Guelph Express Company* (1929) S.C.R. 92, in which the *Mostyn* case was applied. In all of these cases the statutes imposed not merely a statutory duty but a responsibility for damages arising from or caused by the breach of it.

It cannot, I think, be said that up to and for some indefinite and indeterminate time after the City's operations of 1931 had begun there was any non-compliance with section 13. But the bending of the pipe, the welded joint of which broke, as I think, on February 21st, 1932, must have been a gradual process and there must have been an appreciable time during which, what for a better term may be called the "subsidence" causing the bending, was going on. Therefore, during the period of time in one sense it may be said that the defendant was not maintaining that part of its works so as not to endanger the public safety. On the other hand if the subsidence, brought about by the act of someone over whom the defendant had no control, had suddenly taken place causing the pipe to

break immediately, I think in no sense can it be said that the defendant had not located, constructed and indeed maintained its works at the point in question so as not to endanger the public safety. After the break occurred the public safety certainly was endangered.

If it were not for what I feel bound by the Raffan case to hold, as a finding of mixed fact and law, I would find that the defendant had not exceeded its statutory authority, but in view of that decision I must hold that, for some appreciable period of time after the City's operations of 1931 were completed the portion of the pipe, the welded joint of which broke in February, 1932, had not been maintained so as not to endanger 10
the public safety.

Although what may be termed the exception of "common benefit" was not expressly dealt with in the Raffan case, I feel bound, sitting as a Trial Judge, to take it to be a necessary implication from the decision therein that that qualification of the rule in *Rylands vs. Fletcher* is not open to be given effect to by me.

This qualification of the rule was recently adverted to by Mr. Justice Lamont in *Kelliher (Village of) vs. Smith* (1931) S.C.R. at p. 682. In that case Lamont, J., referring to the rule in *Rylands vs. Fletcher*, said:

"That rule provides that any person who, for his own purposes, 20
brings on his land or keeps or collects there anything likely to do mischief if it escapes, keeps it at his peril. If it escapes and does harm to others, the owner is responsible independently of the existence of either wrongful intent or negligence on his part. The rule, however, only applies where the dangerous agency is kept by the defendant for his own purposes. It therefore has no application where, as here, the extinguisher was brought to the village for the common protection of the corporation and its citizens as individuals."

If it were not for the effect of section 11 (now 13) which, as it ap- 30
pears to me, must be taken to have been given to it in the Raffan decision, I would have thought that this principle of distinction might, if canvassed therein, have led to the conclusion that the owner of the dangerous agency was not responsible independently of the existence of negligence on its part, because the exception of common benefit is of wider application than that which would limit it to cases of occupiers of different storeys or rooms in a building in which the thing dangerous if it escapes is kept or stored.

This view seems also to have been in the mind of Lord Blanesburgh in *Manchester Corporation vs. Farnworth* (1930) A.C. where at pp. 203- 40
4 he said:

"Very readily would I decide if I felt at liberty to do so, that the loss resulting to the plaintiff from the defendants' operations

should without any qualification be borne by the Corporation. That loss is truly just as much part of the cost of generating their electrical energy as is, for example, the cost of the coal whose combustion is the original cause of all the mischief. In a question between the plaintiff on the one hand and the Corporation on the other I can discover no sound principle why this loss should not be theirs. The plaintiff's lands are outside the area of supply. He is not himself resident within it. He derives no benefit from, has no concern in, responsibility for nor control direct or indirect, over their electrical undertaking or its working. Why then should the final burden of such damage as has been proved in these proceedings rest upon him and not upon those causing it and through them upon those benefitting by or interested in the undertaking of which this power station forms a part? It is difficult to say."

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This principle was recently held by Robson, J.A., in *Darbey vs. Winnipeg Electric Co.* (1933) 1 W.W.R. 566 to be applicable as against an invitee on the premises of a consumer of gas so far at least as its escape was from that part of the distribution system which was on the consumer's premises. At p. 574 Robson, J.A. said:

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"In the first place it seems to me to be impossible to treat those parts of the distribution system of utility companies which are on the consumer's premises, or the gas, electric current or water kept there under force for the use of the occupant, as being within the rule in *Rylands vs. Fletcher*. Such systems are, in my view, not even to be classed as exceptions to that rule. The rule applies to a dangerous article, or one that may become dangerous if it gets away, brought or kept on a defendant's premises for his own uses. In cases like this the gas is not kept on the premises as a storehouse but merely as a service to the applicant. If it is a case of negligence the rule in *Rylands vs. Fletcher* is not required for the purpose of finding liability."

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In view of the development of the legislation in the twenty years since the *Raffan* case was decided, by which Public Utilities, such as this defendant company, and their works, operations and rates have, in the public interest, been placed under the supervision and control of the Board of Public Utilities of this Province, and in particular the power given to the Board to require a Gas Company to augment its supply of natural gas on the application of a municipality, it may not be too presumptuous on my part to suggest that it cannot now be said that the necessary construction now to be put upon section 13 of the Water, Gas, Electric and Telephone Companies Act is that what has sometimes been called the "wild beast theory" is applicable to public utilities making use, in the public interest, of the natural resources of a new country, and that, however non-negligent they may be, such public utilities may have imposed upon them a liability for such an accident as that with which I am dealing

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*In the
Supreme
Court of
Alberta*

—
No. 66
Reasons for
Judgment.
27th Feb-
ruary, 1934.
continued.

*In the
Supreme
Court of
Alberta*

No. 66
Reasons for
Judgment.
27th Feb-
ruary, 1934
continued.

which may result in putting the public utility out of business and prevent it from continuing to use its franchise, or require that the Board of Public Utility Commissioners must permit it to pass the "final burden of such damage as has been proved" to its customers, the consumers of gas, or to "those benefitting by or interested in the undertaking" (to use the words of Lord Blanesburgh) as part of the cost of operation.

It is to be noted that the first "Act respecting Public Utilities, to Create a Public Utility Commission and to prescribe its Powers and Duties" was passed on April 17th, 1915, and was to come into force on proclamation. The judgment of the Supreme Court of Canada was delivered on May 4th, 1915, the judgment of the Appellate Division having been delivered on June 30th, 1914. Since the first Public Utilities Act was passed the powers of supervision and control, particularly with regard to companies supplying natural gas, have been increased, in the interest and for the common benefit of the residents of the Province and its Municipalities, to such an extent that I venture to suggest that the words of the Chief Justice of Alberta (then Harvey, J.) in reference to the City of Medicine Hat are now equally applicable to the present defendant. In *Purmal vs. City of Medicine Hat*, 1 A.L.R. 209, which he distinguished in the Raffan case because "there was no question of restriction upon the defendant's (the City of Medicine Hat's) statutory authority" that learned Judge said: 10

"It will be observed that there are several points of distinction between that case (*Rylands vs. Fletcher*) and the present one. . . . In the third place they were not acting 'for their own purposes' in the sense that the defendant *Rylands* was as for their private interests, but as a public local government body in the interest of the residents of the municipality of whom the plaintiff was one." 20

See The Public Utilities Act R.S.A., 1922 c. 20 and amendments thereto. 30

What Mr. Martland referred to as the "contractual exception" to the rule in *Rylands vs. Fletcher* is clearly open to argument notwithstanding the Raffan decision. It did not arise in that case and, of course, was not discussed in the judgments. If the argument is sound it would relieve the defendants from liability, except upon proof of negligence, to those of the plaintiffs with whom it made contracts for the supply of gas from its system.

The exception to the rule of liability aside from negligence is distinct from, though it would be included in the exception of "common benefit."

In this connection the language of Viscount Finlay and of Lord Atkinson in *Attorney General vs. Cory Bros. & Co.* and *Kennard Bros. vs. Cory Bros. & Co.* (1921) 1 A.C. 521, are appropriate: Lord Finlay at p. 539 used this general language in respect of the liability as between plain- 40

tiffs who had been by contract parties to the bringing of colliery spoil upon their land: "A plaintiff who is a consenting party to the accumulation cannot rely simply upon the escape of the accumulated material; he must further establish that the escape was due to want of reasonable care on the part of the person who made the deposit." Lord Atkinson at p. 545 said: "By reason of that permission the company would not be liable to the trustees if the spoil escaped without any negligence on their part, as they would be liable if the trustees had been strangers with whom they had no contractual relations." Reference may also be made to the
 10 judgment of Robson, J.A., in *Darbey vs. Winnipeg Electric Railway* (1933) 1 W.W.R. 566.

I now deal with the defence that the escape of the gas was caused by the "conscious act of another volition" (Lord Dunedin in *Dominion Natural Gas vs. Collins* (1909) A.C. 640; Anglin, J. in the *Raffan* case) which it is argued would relieve from any initial negligence of the defendant, if found to exist, and would take this case out of the rule in *Rylands vs. Fletcher*, the fresh, independent, intervening cause being the work done and the excavations made by the City of Edmonton in putting in its storm relief sewer in the Spring of 1931, at and between man-
 20 hole "A" and manhole "B" at the intersection of 107th Street and the lane in rear of the *Corona Hotel*.

The *Raffan* case affirms this principle as a limitation of or an exception to the rule in *Rylands vs. Fletcher*. It is found also in the Judgment of the Judicial Committee in *Rickards vs. Lothian* (1913) A.C. 263; in *Box vs. Jubb*, 4 Ex. D. 76; and in *Smith vs. Great Western Railway*, 42 T.L.R. 391; and is the basis of the judgment of *Dennistoun, J.A.* in *Darbey vs. Winnipeg Electric Co.* (1933) 1 W.W.R. 566.

It is true that the actual decision in *Rickards vs. Lothian* would seem to confine the limitation or exception to the "wrongful" acts of third persons. It has been suggested also that the act of the third party must have
 30 been "malicious" or "mischievous" or "wrongful" or at least "negligent."

I think the true view of the law as to the act of a stranger, both as relieving from initial or original negligence and by way of exception to or as a limitation of the rule in *Rylands vs. Fletcher*, is that where the escape of the dangerous article or agency is caused by the act of a stranger over whom the owner or keeper thereof has no control, the happening or the injurious effect of whose act he could not reasonably be expected to anticipate, such owner or keeper is not liable for the escape and its results.

This rule seems to me to be clearly deducible from the language of
 40 *Kelly, C.B.* in *Box vs. Jubb* when he said: "I think the defendants could not possibly have been expected to anticipate that which happened here." The fact that the act of the third party was "wrongful" merely made it an example of the general proposition with which he was dealing. So also the

*In the
 Supreme
 Court of
 Alberta*

—
 No. 66
 Reasons for
 Judgment.
 27th Feb-
 ruary, 1934
continued.

*In the
Supreme
Court of
Alberta*

No. 66
Reasons for
Judgment.
27th Feb-
ruary, 1934.
continued.

language of Lord Moulton in *Rickards vs. Lothian* where, after quoting the language of Bramwell, B. in *Fletcher vs. Rylands* in the Court of Exchequer, he said: "Following the language of this judgment their Lordships are of opinion that no better example could be given of an agent that the defendant cannot control than that of a third party surreptitiously and by a malicious act causing the overflow."

This proposition is equally deducible from the language of Hamilton, L.J. (afterwards Lord Sumner) in *Latham vs. Johnson* (1913) 1 K.B. 398 at p. 413:

"No doubt each intervener is a *causa sine qua non*, but unless the intervention is a fresh, independent cause, the person guilty of the original negligence will still be the effective cause, if he ought reasonably to have anticipated such interventions and to have foreseen that if they occurred the result would be that his negligence would lead to mischief." 10

It cannot be said that the City in extending its sewer service had not the right to do so even without taking what might, at least for the future, be the prudent course of notifying and consulting the defendant. Nor can it be said that the defendant should not have anticipated that the City might desire to do so even at the point in question. Indeed, in the absence of notice, I think the defendant ought to have known, even if it did not, that the operations were going on, because of the length of time they were carried on and the conspicuous and public nature thereof. I think, however, that the defendant had the right to rely upon the City Engineer, with whose Department it had been in close contact when it constructed its distribution system in 1923, seeing that the work was done in such a way that such a result as has happened would not occur. 20

The plaintiffs, both in evidence and argument, endeavored to negative negligence on the part of the City and attempted to fasten on the defendant liability for negligence in its original construction in 1923 as being the cause of the mischief. 30

It is clear that the City Engineer did not anticipate such a result as has happened, and, whether negligence is to be imputed to the City or not, I think that the injurious effect of the City's operations was one which the defendant could not reasonably be expected to anticipate. If it were one which the defendant should reasonably have been expected to anticipate, it would have been negligence on its part not to have anticipated and guarded against it, and resort to the principle of *Rylands vs. Fletcher* would be unnecessary. The City was a stranger over whom the defendant had no control. Its act which caused the injury was such an independent cause as relieves the defendant from liability except upon proof of negligence. 40

The action will therefore be dismissed with costs including the costs of the examinations for discovery to be taxed under double Column 5.

No. 67.**Notice of Appeal**

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

No. 67
Notice of
Appeal
8th May,
1934.

10 TAKE NOTICE that the plaintiffs intend to appeal and hereby appeal from the judgment of the Honourable Mr. Justice Ford, the Trial Judge, herein, dated February 27th, 1934, and entered on the 20th day of April, 1934, or for a new trial of this action insofar as concerns the cause of the break in the twelve inch intermediate pressure gas main of the defendants in the reasons for judgment referred to which the trial judge finds to have broken by reason of the operations of the City of Edmonton in constructing its tile overflow sewer between manhole "A" and manhole "B" and the weir chamber at manhole "A" on 107th Street, Edmonton, in the year 1931 and for such orders or directions as to such new trial and the submission of evidence thereon as to the Court shall seem meet, or for such further or other order or orders, direction or directions as to the Court shall seem meet upon the following amongst other grounds:

1. That the judgment is contrary to law and evidence and the weight of evidence.
2. That evidence was improperly received and that evidence was improperly rejected.
- 20 3. That the trial Judge's conclusion that there is no liability in the defendant aside from negligence is erroneous.
4. That the defendant did not locate and construct its gas main so as not to endanger the public health and safety.
5. That to hold, as the Trial Judge holds, that the defendant should have anticipated that the city might desire to extend its sewer system in the way it did in 1931, and ought to have known even if it did not actually know that the city were in the course of doing so, but that nevertheless the defendants are not responsible for the damage caused by the gas escaping from the break in their pipe caused, as he finds, by this very construction, is contrary to the well established principles of law governing the liability of persons for damage caused through the escape of a dangerous thing brought and kept by them on their own property and subject to their own control;
- 30 6. That the Trial Judge erred in concluding that if the defendant could not reasonably be expected to anticipate the injurious effect of the city's construction in 1931 the defendant was not liable for the escape of its gas and the results thereof. It is the act of a stranger not its effect, that being negligent, malicious,

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

No. 67
Notice of
Appeal
8th May,
1934.
continued.

mischievous or wrongful could not therefore have been reasonably anticipated or guarded against by the owner of a dangerous thing, that in some of the legal decisions on the subject has been held to relieve the owner of the dangerous thing from the consequences of its escape.

7. That the defendant had a qualified authority only to locate, construct and maintain its gas mains in the city, such qualification being that they must do so so as not to endanger the public health and safety; that such qualification existed and was effective as well after the city's construction in 1931 as before; that the defendant conducted its enterprise in the city so that the public health and safety was endangered; and that therefore the defendant is liable for the damages claimed in this action. 10
8. That the intervention of the city by its construction in 1931 was not such a fresh intervening cause of the escape of the defendant's gas from its main as to free the defendant from liability for damages therefor.
9. That the act of the city in the extension and construction of its sewer system at the corner of 107th Street and the lane south of Jasper Avenue in Edmonton in 1931 was not the "act of a stranger" within any exception to the rule of liability of the owner of a dangerous thing for damages for its escape. 20
10. That for the "act of a stranger" to be within the purview of any of the cases cited by the Trial Judge or any other similar cases it must be an act done without the knowledge, consent or acquiescence of the person sought to be charged with liability for damages due to the escape of the dangerous thing, and must operate as the immediately effective cause of the escape independently of anything done or omitted to be done by the person so sought to be charged with liability and that the facts proved in evidence and found by the Trial Judge preclude the possibility of the city's construction in 1931 being so regarded. 30
11. That the defendant's reliance upon the City Engineer to which the Trial Judge refers has the same effect so far as liability to the plaintiffs is concerned as though the defendant had itself engaged in the construction done by the city in 1931.
12. That the defendant continuously throughout the time between the construction of its gas main in 1923 and the fire in February 1932 held itself out to the plaintiffs among others as exercising its powers so as not to endanger the public health and safety; the defendant knew or must be taken to have known of the 40

city's construction in 1931; the defendant is therefore estopped from denying liability to the plaintiffs in the premises, or from seeking to escape from such liability by reason of such city construction.

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

- 10 13. That the Trial Judge erred in concluding that if it were not for the limitation of the defendant's statutory authority to locate and construct its gas mains contained in the provisions of the Water, Gas, Electric and Telephone Companies Act that requires the defendant to so locate and construct its gas mains so as not to endanger the public health and safety the defendant would not be liable without proof of negligence, and erred in concluding that such principle of law was recognized in the judgment of the Supreme Court of Canada in the case of Raffan v. Canadian Natural Gas, etc. Co. 7 A.L.R. 459, 8 W.W.R. 676.
14. That the Trial Judge erred in concluding that the said Raffan decision does not decide that because danger to the public safety has ensued it must be taken that the defendant loses its statutory protection.
- 20 15. That the finding of the Trial Judge to the effect that for some appreciable period after the city's operations of 1931 were completed the portion of the defendant's pipe, the welded joint of which broke in February, 1932, had not been maintained so as not to endanger the public safety, entitles the plaintiffs to judgment.
16. That such finding is inconsistent with the dismissal of the action by the Trial Judge.
- 30 17. That there is no validity in the suggestion contained in the reasons for judgment of the Trial Judge that some of the plaintiffs may have been consenting parties to the accumulation of gas by the defendants, or that, even if this is so, this circumstance in any wise affects the right of such persons to recover damages from the defendants for the loss and damages suffered by them by the fire proved in evidence.
18. That upon the findings of the Trial Judge the defendant is responsible to the plaintiffs in damages for the injury done through the escape of the defendant's gas independently of the circumstance that the thing that so escaped was a dangerous thing.
- 40 19. That the finding of the Trial Judge that no negligence is to be imputed to the defendants in not anticipating and guarding against the injurious effect of the city's operations cannot be supported.

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No. 67
Notice of
Appeal
8th May,
1934.
continued.

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

No. 67
Notice of
Appeal
8th May,
1934.
continued.

20. That there is no justification in evidence for the conclusion of the Trial Judge that the defendant had a right to rely upon the city engineer seeing that the work done by the city in 1931 was done in such a way that such a result as happened would not occur.
21. That even if the Trial Judge be right in the conclusion in the last preceding paragraph mentioned this does not relieve the defendant from liability for damages caused by the escape of its gas.
22. That it was the defendant's duty to guard against any untoward consequences of its gas escaping owing to the city's construction in 1931. 10
23. That upon the findings of fact of the Trial Judge the defendants were guilty of negligence causing the loss and damage complained of.
24. That the conclusion of the Trial Judge that the injurious effect of the city's operations was one which the defendant could not reasonably be expected to anticipate is wrong because—
 - (a) The city's said operations did not in fact injuriously affect the defendant's gas main, and
 - (b) Even if they did the defendant should have anticipated and 20 guarded against such injury to its gas main.
25. That the finding of the Trial Judge that the cause of the break in the welded joint of the gas main through which the gas leaked was the operations of the city in constructing the tile overflow sewer between manhole "A" and manhole "B" and the weir chamber at manhole "A" in the year 1931, is a finding that cannot reasonably be come to upon the evidence.
26. That such finding is contrary to the undisputed physical facts upon the ground as shown in evidence.
27. That such finding of fact is contrary to the undisputed evidence 30 in relation to the condition of the city's water and sewer services at the place in question above the said tile overflow sewer and weir chamber and below the said gas main.
28. That the evidence called on behalf of the plaintiffs that it was not physically possible that the city's water and sewer services at the place in question above the said tile overflow sewer and weir chamber and below the said gas main could be in the condition they were found to be at the time of trial if the city's said 1931 construction were the cause of the break in the said welded joint in the said gas main was not controverted nor were the wit- 40

nesses who so testified, cross-examined upon the said evidence, and that such evidence should have been accepted as correct by the Trial Judge.

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

29. That the Trial Judge erred in not giving effect to the claim of the plaintiffs founded upon the defendant's liability for damage caused by the escape of its gas.
30. That the Trial Judge erred in not giving effect to the plaintiffs' claim founded upon the breach by the defendant of the Water, Gas, Electric and Telephone Companies Act as in the statement of claim set out.
31. That the Trial Judge erred in not giving effect to the claim of the plaintiffs founded upon nuisance.
32. That the Trial Judge erred in not giving effect to the plaintiffs' claim founded on negligence as in the statement of claim set out.
33. That the Trial Judge erred in refusing to permit the plaintiffs to give evidence of the actual underground conditions at the place where the city's tile overflow sewer between said manholes "A" and "B" and the said weir chamber were constructed;
34. That the Trial Judge erred in refusing to permit the plaintiffs to give and develop evidence showing that in the opinion of the expert witnesses called on their behalf the conditions of the city's services between the said overflow and weir chamber and the said twelve inch intermediate pressure gas main of the defendants notably the six inch tile drain from the catch basin to manhole "A" and the north and south sewer on 107th Street was such as to preclude the possibility that the construction by the city in 1931 of the said tile overflow sewer and weir chamber caused the said gas main to subside and break;
35. Alternatively that the Trial Judge erred in that while permitting the plaintiffs to give evidence of the fact that the said city services between the said tile overflow sewer and weir chamber and the said gas main were presently in the position and condition as in such evidence described he refused to permit the plaintiffs to give fully and completely the reasons and opinions of their said expert witnesses to show the bearing of the facts so disclosed upon the issue as to the cause of the break in the said twelve inch intermediate pressure gas main;
36. That the Trial Judge improperly interfered with and limited the plaintiffs in the giving of the said evidence in the preceding paragraphs hereof referred to.

No. 67
Notice of
Appeal
8th May,
1934.
continued.

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

No. 67
Notice of
Appeal
8th May,
1934.
continued.

37. That the Trial Judge erred in refusing to permit the plaintiffs unless with the consent of the defendants to open up or to have the city open up for them the pavement at the corner of 107th Street and the lane south of Jasper Avenue down to the said tile overflow sewer and weir chamber so as to expose the actual conditions on the ground and give evidence thereof in answer to the suggestion ultimately adopted by the Trial Judge in giving judgment dismissing the action that it was the construction by the city of the said tile overflow sewer and weir chamber in 1931 that caused the subsidence in the ground above which caused 10 the break in the said gas main.
38. That the trial of the issue as to the cause of the break in the gas main was unsatisfactory, and that there should be a new trial of this issue.
39. That evidence of more than three persons entitled according to the law or practice to give opinion evidence was called and given by the defendants notwithstanding the objection of the plaintiffs thereto.
40. That evidence was improperly rejected of other fires or explosions in the city caused by the escape of gas from the defendant's 20 gas mains.
41. That the defendant was permitted to give opinion evidence of the witness Cameron upon the subject of the cause of the subsidence of its gas main without the said witness being qualified to give such evidence.
42. That the defendant was permitted to give opinion evidence of the witness Buchanan upon the subject of the cause of the subsidence of its gas main without the said witness being qualified to give such evidence.

AND TAKE NOTICE that upon the said application will be read the 30 proceedings had and taken in this action, the evidence given and exhibits filed at the trial relevant to the issues herein mentioned, the reasons for judgment and judgment of the Trial Judge, together with such further material as Counsel may advise.

DATED at Edmonton, Alberta, this 8th day of May, 1934.

WOODS, FIELD, CRAIG & HYNDMAN,
Solicitors for the Plaintiffs.

TO:

MESSRS. Milner, Steer, Dafoe, Poirier & Martland,
Solicitors for the Defendant.

Judgment As To Contents of Appeal Book.

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

No. 68
Judgment
as to
Contents of
Appeal
Book,
25th June,
1934.

On the application made on behalf of the plaintiffs, who have given notice of appeal from the judgment at the trial of this action, the plaintiffs (appellants) contended that the evidence at trial of the witnesses, Christie, Schofield, Hebb, Chappelle, Mayo, Semple, Williamson, Constable, Hargrove, Browning, Airth, Campbell, Lockie, Booth, T. Templeman, R. Templeman, Dutton, McKenzie, Barnhouse, R. White, Boomer, Atherton, and any other witnesses whose evidence is exclusively concerned with the fact as to whether the fire in question was caused by the ignition of natural gas that escaped from the defendant's gas main should be omitted from the appeal book required by Rule 338 to be filed, on the ground that the same is immaterial to the questions involved in the appeal.

Clause (2) of Rule 338 provides that: "In any case in which any portion of the evidence or any exhibit or any portion thereto is immaterial to the questions involved in the appeal, the same shall be omitted."

Although the question stated above was in issue on the pleadings no evidence except or by way of cross-examination of the plaintiffs' witnesses, was given at the trial to controvert the fact alleged that the fire in question was caused by the ignition of natural gas that had escaped from the defendant's gas main, and that fact was not controverted in the arguments of counsel for the defendant at the trial.

The finding made by me on the point in question is contained in the following passage in my reasons for judgment:

"On February 21st 1932, a fire broke out in the basement of the Corona Hotel in the City of Edmonton which burned down the hotel building and caused considerable other damage. The fire was caused by the igniting of a mixture of natural gas and air. The natural gas was that of Northwestern Utilities Limited, the defendant, and had escaped from that company's twelve inch intermediate pressure gas main through a break in a welded joint in the main in the middle of the intersection of 107th Street and the lane in the rear of the Corona Hotel, the gas finding a channel through and along an eight inch by twelve inch wooden box containing the City of Edmonton's street railway electric return cables and finding a way through the soil in the rear of the hotel and through openings in the walls thereof."

Counsel for the defendant opposes the omission asked for by the plaintiffs' counsel on the ground that the statement of defence raises two

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

No. 68
Judgment
as to
Contents of
Appeal
Book,
25th June,
1934.
continued.

questions upon which the evidence is material and which questions the defendant wishes to reserve the right to raise upon the argument of the appeal. These questions are:

- (1) That the spread of the fire and the burning of the building was the result of the negligence and the intervening act of a third party, namely; the City of Edmonton Fire Department, and
- (2) That the City of Edmonton had constructed a wooden conduit box in dangerous proximity to the defendant's gas main which it is suggested may have some bearing upon the question of the defendant's liability for the damage alleged.

10

The defendant's counsel taking this position I cannot say that the evidence which the plaintiffs have endeavored to have excluded from the appeal book, the elimination of which would certainly save considerable expense, is "immaterial to the questions involved in the appeal." The defendant is, however, entitled to have some permanent record made of its endeavor to save expense and these reasons for my settlement of the contents of the appeal book will answer this purpose.

I, therefore, direct that the appeal book herein contain the following:

1. Copy of the pleadings in the action as amended.
2. Copy of the evidence at the trial.
3. Copy of the documentary exhibits filed at the trial save where omitted by consent of solicitors for the plaintiffs and the defendant.
4. Copy of the reasons for judgment of the Trial Judge.
5. Copy of the formal judgment.
6. Copy of the order settling the contents of the appeal book.

20

The costs of the application to settle the contents will be costs in the appeal.

"FRANK FORD," 30
J.

EDMONTON, June 25th, 1934.

No. 69.
Formal Judgment.

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

IN THE SUPREME COURT OF ALBERTA, APPELLATE DIVISION

The Honourable Chief Justice Harvey
The Honourable Mr. Justice Clarke
The Honourable Mr. Justice Mitchell
The Honourable Mr. Justice Lunney
The Honourable Mr. Justice McGillivray

} Thursday the 6th day
of December, A.D. 1934.

No. 69
Formal
Judgment,
6th Decem-
ber, 1934.

10 The Appeal of the above named Appellants (Plaintiffs) from the judgment of the Honourable Mr. Justice Ford, the Trial Judge herein, dated February 27th, 1934, and entered on the 20th day of April 1934 coming on for hearing before this Court on the 22nd, 23rd, 24th, 25th and 26th days of October, 1934, in the presence of Counsel for the Respondent (Defendant), upon hearing read the proceedings had and taken in this action, the evidence given and exhibits filed at the trial hereof and the reasons for judgment of the Trial Judge, and upon hearing what was alleged by Counsel aforesaid, and judgment having been reserved to this day and the same coming on this day for judgment.

20 1. This Court Doth Order and Adjudge that the appeal of the Appellants (Plaintiffs) be and the same is hereby allowed with costs and that judgment be entered for the Appellants (Plaintiffs) for damages to be ascertained with costs, including costs of examinations for discovery.

2. And This Court Doth Further Order and Direct that this action be referred back to the Trial Judge to assess or direct the manner of assessment of the damages hereinbefore referred to.

30 3. And This Court Doth Further Order and Adjudge that the Respondents (Defendants) do pay to the Appellants (Plaintiffs) the costs of action and appeal, on the scale of double column five of the Rules as to costs forthwith after taxation thereof.

"R. P. WALLACE"
C.

Entered this 17th day of
December, A.D. 1934.

"R. P. WALLACE"
C.

No. 70.**Reasons for Judgment.**

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

(a) HARVEY, C.J.A.

No. 70
Reasons for
Judgment,

(a)
Harvey,
C.J.A.
5th Dec-
ember, 1934

This is an appeal by the plaintiffs from a judgment of Ford, J., dismissing the plaintiffs' action for damages arising out of the burning of the Corona Hotel, after trial without a jury.

The defendant has a franchise from the City of Edmonton under which it supplies natural gas to the inhabitants of the city. The gas is piped to the city from wells outside and in the city the pipes are laid underground in the streets and lanes. In constructing its works it laid pipes along the lane running east and west at the rear of the lots on the south side of Jasper Avenue. The Corona Hotel was situate on the south side of Jasper Avenue between 106th and 107th Streets and extended back to the lane in which were laid two pipes of the defendant, a twelve inch intermediate pressure main in which the gas was under a high pressure and a ten inch low pressure main from which the gas was conveyed to the various consumers for consumption. 10

The Trial Judge found, and the correctness of the finding is not now questioned, that where the pipes cross 107th Street a break occurred in a welded joint of the intermediate pressure main from which gas escaped and made its way easterly and entered the Corona Hotel premises when it became ignited, as a result of which the hotel was burned down. The action is brought by persons who suffered loss by reason of the fire and insurance companies who have indemnified some of the sufferers. 20

The only question that was tried was that of the legal liability of the defendant, it having been provided that if legal liability were established the amounts of the damages would be ascertained in such manner as the Trial Judge might direct.

The fire occurred on the 21st February, 1932, and the conclusion of the learned Trial Judge was that the break occurred only a few hours earlier, probably on the same day. 30

The gas mains in question were laid in 1923. 107th Street had been paved with a concrete pavement in 1913 but the lane was not then paved though it was subsequently. In laying the mains across 107th Street, instead of breaking the pavement all the way across to make an open trench a break was made in the middle of the street and at each side and the earth excavated underneath the pavement to make a tunnel. The lengths of pipe were not sufficient to reach across the street so four lengths were united by welding them together and a sufficient length of pipe so welded was pulled through the tunnel. The break that was found was at the weld almost in the centre of the street at its intersection with the lane. When the mains were laid there was at the centre of this intersection a manhole constructed by the city in 1907 in connection with 40

its sewerage system from which radiated in several directions sewer and drainage pipes portions of which were directly underneath parts of the gas mains which mains were laid in close proximity to the manhole, the ten inch main being about if not quite touching the outside wall of the manhole, the twelve inch main being a few inches from it on the side away from the manhole. The twelve inch main was placed three feet five inches below the bottom of the pavement, making its base four feet six inches down. The pipes for the city utilities varied in depth from seven feet to sixteen feet.

10 In 1926, three years after the gas mains were placed in position, the city placed a wooden conduit to enclose street railway electric cables along side of, close to and parallel with the twelve inch gas main. The wood of this was found to have been somewhat decayed at the time of the fire so that it was possible for the gas easily to enter it when it escaped from the main and to make its way east along the lane, from which or from the soil alongside it made its way into the Corona Hotel basement where it became ignited.

20 Early in the year 1931 the city laid a fifteen inch tile storm sewer pipe from the bottom of the manhole at the intersection of 107th Street and the lane in a northeasterly direction connecting with another manhole constructed at the same time on the east side of 107th Street. This was practically on the same level as the city twelve inch sewer constructed in 1907 which ran east and west along the lane parallel with and almost directly underneath the gas mains. The base of this storm sewer was sixteen feet below the pavement or eleven and one-half feet below the base of the twelve inch gas main. For the operation of the storm sewer there was constructed and connected with the manhole what is called a weir chamber the top of which on its outside was four feet six inches above the base of the storm sewer, that is, seven feet below the base of the gas main. This
30 weir chamber is in length and width about the same as in height. It is directly beneath the twelve inch gas main but no portion of the storm sewer which goes out from it, is. The excavation for the storm sewer and weir chamber was by way of a tunnel from manhole to manhole and naturally more earth would be taken out than would occupy the space which the chamber and tile sewer took up. The excess space was filled and packed in after the completion of the weir chamber and the sewer.

The learned Trial Judge found that by reason of the excavations in connection with the storm sewer construction the earth underneath the twelve inch gas main settled which let down the support for the gas main
40 in consequence of which the break occurred. It was found that at the time and place of the break the main was six and one-half inches lower than at the street sides about thirty-eight feet distant.

In *Raffan vs. Canadian Western* (1914) 7 A.L.R. 459, this Court held that the plaintiff, who had been injured by an explosion of gas escaped from the pipes of the defendant, a company supplying gas in the City of

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

—
No. 70
Reasons for
Judgment,
(a)
Harvey,
C.J.A.
5th Dec-
ember, 1934
continued.

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

No. 70
Reasons for
Judgment,
(a)
Harvey,
C.J.A.
5th Dec-
ember, 1934
continued.

Calgary as the defendant in this case is in the City of Edmonton, was not required to prove negligence in order to establish liability and our decision was affirmed by the Supreme Court of Canada, 8 W.W.R. 676. The argument on behalf of the defendant in that case was that of statutory authority but it was pointed out that one of the statutory provisions of the Water, Gas, etc., Company ordinance under which it had its statutory authority was that the location and construction of its works should be such as "not to endanger the public health or safety." and that that provision was not to be limited to the time of the actual construction but that the location and construction was to be such that there would be no danger 10 to health and safety in the subsequent operations. In other words, the company had no statutory authority to do anything that would "endanger the public health or safety" and if its operations had the effect of "endangering the public health or safety," then, gas being a dangerous substance that might cause injury unless kept under control, the principle enunciated in *Rylands vs. Fletcher*, L.R. 3 H.L. 330, applied and the question of liability did not depend on negligence. The present defendant contends, that the Statute C. 168 R.S.A. 1922, which is in the same terms as the ordinance of the Raffan case, does not apply to it because it is a company incorporated under Dominion Statute and at the time of the con- 20 struction of its work the Act in question did not apply to such company. Of course if that contention be correct the Company does not come under the Statute's protection but the gas franchise which the defendant is exercising is provided for by an agreement which was ratified and confirmed by Statute, Chapter 29 of 1916, which the defendant says is its authority. The learned Trial Judge rejected the defendant's contention in this regard and I think quite rightly so. The franchise was not granted to the defendant but to another company which assigned its rights to the defendant. That company was entitled to the protection and subject to the burdens of the Water, Gas &c. Act by virtue, not merely of the fact of it 30 being a company to which the Statute expressly applied but also by the terms of the franchise agreement and the Statute confirming it. Whatever rights the defendant acquired by virtue of the assignment from the other company it took subject to the burdens attaching to them.

But the learned Trial Judge held that the defendant was not liable because the break in the pipe from which the damage resulted was caused by a third party, namely the City of Edmonton by its excavation in 1931 which caused the settlement of the bed in which the defendant's gas main lay. In his reasons he expresses the view that the law is that "when the escape of the dangerous article or agency is caused by the act of a 40 stranger over whom the owner or keeper thereof has no control the happening or the injurious effect of whose act he could not reasonably be expected to anticipate such owner or keeper is not liable for the escape and its results."

Whether the decided cases do or do not support the proposition as

broadly as stated it is not suggested that they go any further and it will be seen that there is always the question of whether the act of the stranger or its injurious effect could be reasonably anticipated.

We are strongly urged to reverse the learned Trial Judge's finding that the city's operations were the cause of the breaking of the main. It is pointed out that it is contrary to the evidence furnished by the physical facts and rests solely on the theoretical views of expert witnesses which are controverted by the plaintiffs' experts. Mr. Woods also contends that even if the finding be sustained it was not the act of the city
 10 that caused the break but the result months after in conjunction with other elements, frosts, etc., and that the proposition of law to be gathered from the authorities limits its application to the act itself. The learned Trial Judge apparently applied his proposition to the result rather than the act itself for he found as a fact that the defendant knew or ought to have known of the city's operations at the time of the excavations. In view of his finding, on the evidence of experts that the ground did settle and let down the main I find it difficult to see how it could be said that even the effect of the city's operations could not have been anticipated. Certainly it seems to me that their evidence involves the con-
 20 clusion that the settlement of the earth would or might be the consequence of the city's operations and therefore that it could have been reasonably anticipated and the defendant does not therefore come within the exceptions to the rule of *Rylands vs. Fletcher*.

It appears to me however that the doctrine of *Rylands vs. Fletcher* does not require to be invoked to attach liability to the defendant.

The care that the law imposes upon persons having control of dangerous substances and agencies is one of high degree. This was clearly emphasized in the judgment of the Privy Council in *Dominion Natural Gas Co. vs. Collins*, 1909, A.C. 640. That was a case in which the Gas Com-
 30 pany was held liable for damage caused by an explosion of gas which could have been avoided by a precaution which it could have taken. At p. 646 Lord Dunedin in delivering the judgment of the board said: "It has, however, again and again been held that in the case of articles dangerous in themselves, such as loaded firearms, poisons, explosives, and other things ejusdem generis, there is a peculiar duty to take precaution imposed upon those who send forth or instal such articles when it is necessarily the case that other parties will come within their proximity. The duty being to take precaution, it is no excuse to say that the accident would not have happened unless some other agency than that of the defendant had in-
 40 termeddled with the matter. A loaded gun will not go off unless someone pulls the trigger, a poison is innocuous unless someone takes it, gas will not explode unless it is mixed with air and then a light is set to it."

This was quoted with approval by Lord Atkin in the recent decision in the House of Lords, *Donogue vs. Stevenson*, 1932, A.C. 562, in which

*In the
 Supreme
 Court of
 Alberta
 (Appellate
 Division)*

—
 No. 70
 Reasons for
 Judgment,
 (a)
 Harvey,
 C.J.A.
 5th Dec-
 ember, 1934
continued.

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

No. 70
Reasons for
Judgment,
(a)
Harvey,
C.J.A.
5th Dec-
ember, 1934
continued.

it was held that a manufacturer of an article intended for consumption owed a duty to any consumer to see that it contained nothing injurious that could not be ascertained by ordinary inspection.

Here we find the Gas Company, under its franchise, laying its pipes and mains underground throughout the city streets and lanes in which were city sewer drainage and water pipes, manholes and whatever else might be required by the city for its utilities. It could not be otherwise than apparent to the defendant that there would, from time to time, be operations in the streets and lanes that might affect its pipes and their security. The learned Trial Judge expresses the view that the defendant had a right to rely on the care that would be exercised by the City Engineering Department not to do anything that would injuriously affect its pipes. That may perhaps be so, though I express no opinion, as between the city and the defendant, but what we are concerned with here is not the city's obligation to the defendant but the defendant's obligation to the public who may be affected by its operations. I cannot think that the defendant performed its full duty to them when it failed to inspect city operations which might affect the security of its pipes and to take such steps as might be necessary to protect them. It would have meant extra trouble and expense no doubt but there would have been no difficulty in ascertaining from the city where such operations were taking place and seeing that all proper safeguards were taken as provided. It does not appear that Section 8 of the Water and Gas Act, which provides that no other pipes shall be laid within six feet of the gas pipes when once laid, could be intended to provide for such a situation as we have here, nor would it appear to have any application if it did, for even if the six feet may be measured vertically as well as horizontally, the pipes laid by the city in 1931 were more than six feet from the defendant's main, which however, was laid much nearer than six feet to some of the city's pipes theretofore laid. Moreover, that would also be only a matter as between the city and the defendant.

If the evidence on behalf of the plaintiffs is to be accepted, not merely was the injury to the defendant's main not caused by the settlement of the soil due to the excavations made by the city, but no such consequence could have been reasonably contemplated. But if that were so, then the defendant's whole case falls to the ground and it has no excuse, but would be liable on the principle of *Rylands vs. Fletcher*. If on the other hand the defendant's own evidence be accepted in this regard as it was by the Trial Judge, then it was in my opinion negligent in not taking proper precaution to prevent the injurious result occurring. It was dealing with a very dangerous substance and was called on to exercise the highest degree of care, yet it took no steps to apprise itself of excavations in the streets and lanes where its pipes were, which it must have known would frequently be made and in which in many cases an injurious consequence

to its pipes might be apparent whether it was so in this case or not. In my opinion, in this failure is disclosed negligence in the duty the defendant owed to those who might be injuriously affected.

Counsel on both sides presented us with most valuable and exhaustive arguments, both written and oral, in which the whole field was covered, but in the view I have reached and being of opinion that the defendant is liable on the ground of negligence, it appears to me unnecessary to consider any other arguments than the ones dealt with.

10 For the reasons stated I would allow the appeal with costs and direct judgment to be entered for the plaintiffs for damages to be ascertained with costs including costs of examinations for discovery. The case should go back to the Trial Judge to assess or direct the manner of assessment of damages. As it is apparent that the damages will be large, the costs directed to be recovered should be taxed on the highest scale, that is double Column 5.

(b) CLARKE, J.A.
I concur.

(c) MCGILLIVRAY, J.A.
I concur.

20 (d) LUNNEY, J.A.
Dissenting.

30 Plaintiffs seek to hold defendant responsible in damages for loss occasioned by a fire in the Corona Hotel and adjacent properties. Natural gas, carried in the pipe line of the defendant Company had escaped through a broken main, and after entering the basement of the Corona Hotel ignited, with resultant loss. A pipe had been laid across 107th Street in 1923. Several sections of this pipe had been welded together and laid on the soil underlying the street, tunnels having been constructed for the placing of the pipe. The escape of gas came from a portion of the pipe at a point where two pieces of pipe had been welded. The break at this point was caused by a subsidence of the earth underneath the pipe, which hung suspended without any support from below. Two theories were propounded as to the subsidence of the earth that had been supporting the pipe. The Trial Judge finds that the cause of the break in the welded joint was the operations of the City of Edmonton in the construction of a sewer adjacent to the welded joint and he finds that "no negligence is to be imputed to the defendant in not anticipating and guarding against the injurious effect of the city's operations."

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

—
No. 70
Reasons for
Judgment,
(a)
Harvey,
C.J.A.
5th Dec-
ember, 1934
continued.

(b)
Clarke,
J.A.
5th Dec-
ember, 1934

(c)
McGillivray
J.A.
5th Dec-
ember, 1934

(d)
Lunney,
Dissenting.
5th Dec-
ember, 1934

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

Eight years after the pipe line had been laid, the City of Edmonton built an overflow sewer adjacent to the pipe line and underneath the pipe line constructed a weir chamber. This latter portion of the work was done underground.

—
No. 70
Reasons for
Judgment,
(d)
Lunney,
J.A.
Dissenting.
5th Dec-
ember, 1934
continued.

I mention this particularly because the surface opening was at a point eleven feet north of defendant's pipe line.

Excavation work was continued from the surface in a northerly direction for a considerable distance up to Jasper Avenue but the work to the south was done underground and there is no evidence that such underground work to the south and under the pipe line was apparent from the surface. No notice of this underground extension to the south was given to the defendant company. It is not suggested that the city was under any statutory obligation to notify the defendant of the work and in that connection the Trial Judge states "in the absence of notice, I think the defendant ought to have known, even if it did not, that the operations were going on, because of the length of time they were carried on and the conspicuous and public nature thereof." In my opinion the evidence does not justify this finding because of the fact that the work which was conspicuous was work which started some distance from the defendant's pipe line and proceeded in a northerly direction. I do not think the evidence warrants an inference that the defendant knew or should have known that any underground work was proceeding in a southerly direction and under the pipe line.

It is, I think, of importance to note, that although the pipe line had been constructed in 1923 it had, apparently, remained in suitable position until shortly after the operations of the city in the construction of the weir chamber.

The Trial Judge arrived at the conclusion that the defendant was not negligent, and in this finding I agree.

Apart from negligence it is argued that the defendant was liable under the principles outlined in *Fletcher v. Rylands*, L.R. 3 H.L. 330.

In *Box v. Jubb*, 1879, 4 Ex. D. 76, Kelly C.B. discusses a point similar to that involved in the present case. "The question is, what was the cause of this overflow? Was it anything for which the defendants are responsible? Did it proceed from their act or default, or from that of a stranger over which they had no control? The case is abundantly clear on this, proving beyond a doubt that the defendant had no control over the causes of the overflow and no knowledge of the existence of the obstruction. The matters complained of took place through no default or breach of duty of the defendants, but were caused by a stranger over whom and at a spot where they had no control. It seems to me to be immaterial whether this is called vis major or the unlawful act of a stranger; it is sufficient to say that the defendants had no means of preventing the occurrence." In *Rickards vs. Lothian*, 1913, A.C. 263, the

foregoing quotation from the judgment of Kelly C.B. is set out, and the judgment continues: "Their Lordships agree with the law as laid down in the judgments above cited, and are of opinion that a defendant is not liable on the principle of *Fletcher v. Rylands* for damage caused by the wrongful acts of third persons."

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

In *Raffan v. Canadian Western Natural Gas, Light, Heat and Power Co.*, 8 W.W.R. 676, the Supreme Court of Canada dismissed an appeal from this division. There was no suggestion in that case that the escape of gas was caused by the action of a third party.

No. 70
Reasons for
Judgment,
(d)
Lunney,
J.A.
Dissenting,
5th Dec-
ember, 1934
continued.

10 In *Hardaker v. Idle District Council*, 1896 1 Q.B. 335, it was held that the district council owed a duty to the public to construct its sewer so as not to injure a gas main. In the judgment, Lindley, L.J. says: "I pass now to consider the duty of the district council in the present case. Their duty in sewerage the street was not performed by constructing a proper sewer. Their duty was not only to do that, but also to take care not to break any gas pipes which they cut under. This involved properly supporting them." In the same case, A. L. Smith, L.J. says: "If a gas pipe be left unsupported it is obvious that it may become fractured and then an escape of gas, with its attendant consequences, will necessarily result."

20 The Trial Judge concludes by stating "the injurious effect of the city's operations was one which the defendants could not reasonably be expected to anticipate . . . The city was a stranger over whom the defendant had no control. Its acts which caused the injury was such an independent cause as relieves the defendant from liability except upon proof of negligence."

I am in agreement with these conclusions and would, accordingly, dismiss the appeal with costs.

(e) MITCHELL, J.A.
Dissenting.

(e)
Mitchell,
J.A.
Dissenting.
6th Dec-
ember, 1934

30 Inasmuch as I am in accord with the learned Trial Judge in his final disposition of this case, and have had the opportunity of reading the opinions expressed in the majority judgment of this Division, I feel that I should not do more than enumerate seriatim his several findings, expressing concurrence in those of them with which I agree and discussing but briefly those which I feel unable to accept.

His material findings are as follows:

40 "The determinate conclusion at which I have arrived . . . is that the plaintiffs' claim based upon negligence fails. The evidence satisfies me that the defendant was not negligent in any respect as alleged . . . that the cause of the break in the welded joint through which the gas leaked was the operations of the City of Edmonton in constructing the twelve

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

No. 70
Reasons for
Judgment,
(e)
Mitchell,
J.A.
Dissenting,
6th Dec-
ember, 1934
continued.

inch tile overflow sewer between manhole "A" and manhole "B" and the weir chamber at manhole "A" in the year 1931. I am convinced also that no negligence is to be imputed to the defendant in not anticipating and guarding against the injurious effect of the city's operations. . . . I am of the opinion that there is no liability in the defendant aside from negligence."

In dealing with the defendant's argument that section 13 herein quoted has no application and that consequently its authority is not thereby restricted, the Trial Judge had this to say: "The statutory authority of the defendant is therefore to be treated by me as limited by the terms 10 of what is now section 13 of Chapter 168 of the Revised Statutes of Alberta which reads as follows:

"13. The Company shall locate and construct its gas or water works or electric or telephone system and all apparatus and appurtenances thereto belonging or appertaining or therewith connected and wheresoever situated so as not to endanger the public health or safety."

The foregoing findings are such as can be fully supported by the evidence and should not, I think, be disturbed.

In a further discussion of the effect of the Raffan case, the Trial 20 Judge expresses himself in these words:— ". . . were it not for this limitation of the statutory authority of the defendant in that case it would not be liable without proof of negligence. This proposition is equally, if not with greater force, applicable to the present defendant."

The Trial Judge appears to have felt bound to treat that case as limiting him to the view that if the public health or safety had been endangered by reason of the defendant's operations, that circumstance alone was sufficient to fix liability, and that the statutory authority was qualified, not absolute. But for this he apparently would not have regarded the defendant as having exceeded its statutory authority. 30

It is the fact that the circumstances from which the exception of "common interest" might arise were present in the Raffan case (8 W.W. R. 676) as in this, and although it was not given effect to there, a reference to the statement of Anglin J., (late Chief Justice), would seem to indicate that an exception to the rule in *Rylands vs. Fletcher* might be applied for he says: ". . . they are liable to him without proof of negligence on their part, unless they can show that the true proximate cause of the accident was not a breach of the duty imposed by s. 11 (now s. 13) but 'the conscious act of another volition'. *Dom. Natural Gas vs. Collins*, 1909, A.C. 640 at p. 646." See also at p. 647: "For against such 40 conscious act of volition no precaution can really avail."

With much respect I venture to suggest that the case is therefore open for the consideration of such qualifications or exceptions as are ordinarily applicable to *Rylands vs. Fletcher*.

If I am correct in this, I see no reason why the exception of "common interest" should not now be applied.

That there is here a question of "common interest" is made abundantly evident by a perusal of the record dealing with matters leading up to the acquisition of the defendant's franchise, from a consideration of the very nature of the undertaking and the tenor of the Legislative enactments confirming the agreement with the city.

As further indicating the common purpose of the defendant's undertaking, notwithstanding the element of private interest by way of profits, I need only cite the following provisions of Chapter 168 R.S.A. 1922:

"3. (1) No company shall be entitled to the benefit of this Act until it has obtained the consent to the exercise of the powers hereby given of the municipal corporation of the city or town within which such powers are to be exercised by such company.

(2) Such consent shall be by by-law and to be on such terms and conditions as the by-law may provide."

"18. When a company has constructed works for supplying any municipality or municipalities with gas, water, electricity or telephones and the company is able so to do, it shall supply all buildings situate upon land lying along the line of any supply pipe or wire upon the same being requested by the owner, occupant or other person in charge of any such building."

Under the Public Utilities Act, 1923, to which the defendant is subject as a Public Utility, provision is made for restrictions as to tolls, earning capacity, rules and regulations for the augmentation of supply, upon request of a municipality, as well as a general supervision, including the making of orders for the safety and convenience of the public.

To hold the defendant liable, apart from negligence, and practically placing it in the position of an insurer, by a strict application of the Raffan case, so as to exclude any benefit derivable from the principle of common benefit, is, in face of the above mentioned restrictions of the Public Utilities Act, placing a burden upon a public service corporation that was not in my view, contemplated by the Legislature or expressed in the Act.

That the defendant is rendering a public service to the community, and one in which all residents of the municipality may participate, within the limits of the plant capacity, similar to that given by the defendant in *Purmal vs. City of Medicine Hat*, 1 A.L.R. 209, is abundantly clear.

40 With respect to the case at bar I think it can reasonably be said, to use the words of Harvey J. (now C.J.) in discussing *Rylands vs. Fletcher* in the *Purmal* case: "they were not acting for their own purposes in the

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

—
No. 70
Reasons for
Judgment,
(e)
Mitchell,
J.A.
Dissenting,
6th Decem-
ber, 1934.
continued.

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

—
No. 70
Reasons for
Judgment,
(e)
Mitchell,
J.A.
Dissenting.
6th Decem-
ber, 1934.
continued.

sense that the defendant Rylands was as for their private interests, but as a public local government body in the interests of the residents of the municipality of whom the plaintiff was one."

Having in mind that the defendant's franchise, though an exclusive one and in the nature of a monopoly, is subject to public control in many respects, including tolls and resultant earning capacity of the enterprise, for the supplying of a commodity to the public in the nature of an "economic good," one is bound to find that the defendant's operations are something more than "for their own purposes". The defendant in respect of its service may be taken as in a position analogous to a "public local government body" insofar as a consideration of the legal rights and duties of the defendant respecting liability is concerned. 10

I think therefore that the defendant should have the benefit of the "common interest" exception or qualification, thus relieving it from liability notwithstanding the finding that the pipe in question had not been maintained in accordance with the requirements of Section 13.

Involved in the defence that the break in the pipe, with resultant escape of gas, was due to the "conscious act of another volition", namely the city's operations in 1931 in constructing certain sewerage works under and near the defendant's gas main, is the question of knowledge on the part of the defendant of such operations having been undertaken and a consequent obligation to see that its own pipes were not interfered with. 20

The Trial Judge has held that in the absence of notice "the defendant ought to have known, even if it did not, that the operations were going on, because of the length of time they were carried on and the conspicuous and public nature thereof." This aspect of the case was argued with much force before us, and although it cannot be said there was no evidence upon which the Trial Judge might draw such an inference, I nevertheless am not convinced that the defendant either had express notice or that the conditions surrounding the city's work, such for instance as the open trench work north of Jasper Avenue along 107th Street and the presence of materials near the manhole openings, were of such a character as to suggest the possibility of these additions to the city's plant or that the defendant's gas mains were likely to be affected or interfered with, either at that time or at a later date and thus to warrant a finding of "knowledge" apart from notice. The city's operations undoubtedly turned out to be of an unusual and special character by reason of the selection of that street intersection for extra storm sewer construction, involving an additional manhole, weir and fifteen inch sewer overflow connection, immediately south of Jasper Avenue, but there appears to have been nothing to indicate that the work would have any relation to or bearing upon the safety or stability of the gas mains, or involved possibilities requiring intervention on the part of the defendant 30 40

for the public safety. The city's work was carried out under supervision of its own engineering department, a department charged in the first instance with supervision of the installation of the gas system and the approval of plans in connection therewith. It is not, I think, reasonable under such circumstances to hold, that with respect to extensions of or repairs to the existing city water or sewer system as required from time to time, there is cast upon the defendant a duty to anticipate that its own works are likely to be interfered with by the city and that damage may result, particularly in cases where the eventual results could not reasonably have been foreseen, as appears to me to have been the case here, for the expert witnesses themselves were unable to agree on the cause of the subsidence and there is no finding that the city's work was carried on negligently.

In *Nichols v. Marsland*, 46 L.J., Ex. at p. 178, Mellish L.J., said: "But we think she ought not to be held liable because she did not prevent the effect of an extraordinary act of nature which she could not anticipate." The Trial Judge has made a finding which, in the light of evidence given by the defendant's expert witnesses, he must have accepted showing conclusively that the physical forces contributing to the subsidence in the manner described could only have been "an extraordinary act of nature" which could not be anticipated. This, it seems to me, has an important bearing upon the duty of the defendant as to "knowledge".

It should, I think, be borne in mind that with respect to the operations of the city and certainly in the case of a common user of the city streets and lanes, there rests also upon the city a duty to protect the public safety, a circumstance to be considered in determining the question as to what extent the defendant is required "to have knowledge", as an element binding the defendant. I can hardly think that section 13 can be construed as imposing that duty upon the defendant nor do I think that any such obligation exists at common law. I therefore hold that negligence cannot be imputed to the defendant by reason of lack of knowledge in this instance or failure to anticipate results.

This being so, I agree with the Trial Judge in his application of the principle of the "conscious act of another volition" as taking the case out of the rule in *Rylands vs. Fletcher*, for although the "fresh, independent, intervening cause" in this instance has not been shown to have been malicious, wrongful or negligent, the intervention appears to have been such as nevertheless may be brought within the line of authorities cited by the Trial Judge as affording a defence to the action on this ground.

As to the exception of contractual relationship, I agree with the Trial Judge that it is open to the defendant as a defence, and insofar as the several plaintiffs who come within the category of users of the gas are concerned, I think it should be applied.

I would dismiss the appeal with costs.

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

No. 70
Reasons for
Judgment,
(e)
Mitchell,
J.A.
Dissenting.
6th Dec-
ember, 1934
continued.

No. 71.

Order Granting Leave to Appeal to His Majesty in Council.

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

IN THE SUPREME COURT OF ALBERTA, APPELLATE DIVISION

At the Court House in the City of Edmonton,
Monday, the 10th day of December, A.D. 1934.

No. 71
Order
granting
leave to
appeal to
His
Majesty in
Council,
10th De-
cember,
1934.

PRESENT:

The Honourable Horace Harvey, Chief Justice of Alberta;
The Honourable Mr. Justice Mitchell;
The Honourable Mr. Justice Lunney.

UPON THE APPLICATION of the Defendant (Respondent) and 10
upon reading the Record herein and upon hearing what was alleged by
Counsel for the Defendant (Respondent), and by Counsel for the Plain-
tiffs (Appellants).

IT IS ORDERED that the Defendant (Respondent) have leave to
appeal to His Majesty in Council from the Judgment of this Court
herein, bearing date the 6th day of December, A.D. 1934, upon condi-
tion of the Defendant (Respondent) within three (3) months from the
date hereof entering into good and sufficient security to the satisfaction
of the Court in the sum of Two Thousand (\$2,000.00) Dollars, for the 20
due prosecution of the appeal and the payment of all such costs as may
become payable to the Plaintiffs (Appellants) in the event of the De-
fendant (Respondent) not obtaining an Order granting final leave to
appeal, or of the appeal being dismissed for non-prosecution or of His
Majesty in Council ordering the Defendant (Respondent) to pay the
Plaintiffs' (Appellants') costs of this appeal, as the case may be, and
upon the further condition that the Defendant (Respondent) procure
preparation of the Record and the despatch thereof to England within a
period of four (4) months from the date hereof.

AND IT IS FURTHER ORDERED that the execution of the Judg- 30
ment of this Court be suspended, pending this appeal.

AND IT IS FURTHER ORDERED that the costs of this Order and
the application therefor shall be costs in the cause in the said appeal
to His Majesty in Council.

R. P. WALLACE,
Registrar at Edmonton.

ENTERED this 18th day
of December, A.D. 1934.

R. P. WALLACE
C. S. C.

No. 71a.

Order granting final leave to Appeal to His Majesty in Council.

IN THE SUPREME COURT OF ALBERTA.
APPELLATE DIVISION.

*In the
Supreme
Court of
Alberta
(Appellate
Division).*

Between

LONDON GUARANTEE AND ACCIDENT COMPANY, LIMITED, ET AL

Plaintiffs (Appellants)

and

NORTHWESTERN UTILITIES, LIMITED

- - - *Defendant (Respondent)*

No. 71a.
Order
granting
final leave to
appeal to
His Majesty
in Council.
8th April,
1935.

10 BEFORE : The Honourable the CHIEF JUSTICE OF ALBERTA ;
The Honourable Mr. Justice CLARKE ;
The Honourable Mr. Justice MITCHELL ;
The Honourable Mr. Justice LUNNEY ;
The Honourable Mr. Justice MACGILLIVRAY,

at the Court House, in the City of Edmonton,

Monday, the 8th day of April, A.D.1935.

UPON the application of the Defendant (Respondent) and upon
hearing its counsel, upon reading the Affidavit of George H. Steer, filed,
and the consent of the Solicitors for the Plaintiffs (Appellants) endorsed
20 hereon, and it appearing that the Defendant (Respondent) did on the 4th day
of March, 1935, enter into good and sufficient security to the satisfaction
of the Court in the sum of Two Thousand Dollars (\$2000.00), and that
the printed Record herein was despatched by the Registrar of this
Honourable Court to the Registrar of the Privy Council on the 4th day
of April, A.D. 1935, both in accordance with the Order of this Honourable
Court, dated the 10th day of December, A.D. 1934,

IT IS ORDERED that the Defendant (Respondent) be and it is
hereby granted final leave to appeal to His Majesty in Council;

AND IT IS FURTHER ORDERED that the costs of this Order
30 and of the application therefor shall be costs in the cause in the said appeal
to His Majesty in Council.

R. P. WALLACE,
Registrar.

Entered this 8th day of April,
A.D. 1935.

R. P. WALLACE.
C.S.C.

Consented to
Approved as to form

40 WOODS FIELD CRAIG & HYNDMAN
for Respondents.

No. 72.**Notice of Application to Exclude Certain Evidence and Exhibits From Record.**

IN THE SUPREME COURT OF ALBERTA, APPELLATE DIVISION

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

No. 72
Notice of
Application
to exclude
certain
evidence
and Ex-
hibits
from
Record.
3rd Janu-
ary, 1935.

TAKE NOTICE that an application will be made on behalf of the Defendant (Respondent) before the Appellate Division of the Supreme Court of Alberta, at the Court House, in the City of Edmonton, on the 7th day of January, A.D. 1935, at the hour of 10:00 o'clock in the forenoon, for directions as to the preparation and the contents of the Record herein, and in particular for a direction that the following evidence be
10 excluded from the said Record as being irrelevant to the subject matter of the appeal, namely:

Evidence of Julian Garrett p. 122 Q. 29 and 30, and Exhibit 6, page 1523;

Evidence of Julian Garrett page 132 line 1 to page 153 Q. 421, and Exhibits 8, 9 and 10, pages 1546 and 1547 inclusive;

Evidence of Julian Garrett page 160, Q. 614 to page 165, Q. 931 inclusive and Exhibit 13, page 1568;

Evidence of Julian Garrett page 165, Q. 990 to page 192, Q. 1228 inclusive, excepting only Q. 1050 on page 167.

20 Evidence of Robert Templeman page 421 to page 426, line 13; page 431, line 28 to page 436, line 13; page 447 and page 448;

All of the evidence of James J. Christie excepting page 192 to page 196 line 12 inclusive;

All of the evidence of H. Mayo commencing page 215;

All of the evidence of J. W. S. Chappelle commencing page 221;

All of the evidence of C. E. Hebb commencing page 226;

All of the evidence of H. E. G. H. Schofield commencing page 231;

All of the evidence of George Williamson commencing page 235;

All of the evidence of Robert Semple commencing page 272;

30 All of the evidence of G. Constable commencing page 287;

All of the evidence of B. P. Hobbs commencing page 296;

All of the evidence of A. Hargrove commencing page 308;

All of the evidence of W. C. Browning commencing page 362;

All of the Evidence of A. Campbell commencing page 381;

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

No. 72

Notice of
Application
to exclude
certain
evidence
and Ex-
hibits
from
Record.
3rd Janu-
ary, 1935.
continued.

All of the evidence of W. B. Airth commencing page 387;
All of the evidence of J. Lockie commencing page 389;
All of the evidence of Colin D. Mackenzie commencing page 394;
All of the evidence of Alex. A. Mackenzie commencing page 417;
All of the Evidence of Ranald White commencing page 419;
All of the evidence of Thomas Templeman commencing page 449;
All of the Evidence of A. Dutton commencing page 494;
All of the evidence of S. G. Francis commencing page 576;
All of the evidence of I. E. Atherton commencing page 577;
All of the evidence of W. Barnhouse commencing page 799. 10

All the evidence of John Booth commencing page 460, excepting page 474, line 26 to page 476, line 5 and page 484, line 5 to page 486, line 7.

All the evidence of Dr. Boomer commencing at page 835, excepting page 836, line 17 to page 839, line 11; page 852, line 27 to page 853, line 29; page 883, line 20 to page 884, line 22; page 891, line 8 to page 896, line 4.

AND FURTHER TAKE NOTICE that in support of such application will be read the relevant portion of the Appeal Book herein and such further and additional material as Counsel may advise. 20

DATED at the City of Edmonton, in the Province of Alberta, this 3rd day of January, A.D. 1935.

MILNER, STEER, DAFOE, POIRIER & MARTLAND,
Solicitors for the Defendant (Respondent).

TO: Messrs. Woods, Field, Craig & Hyndman,
Solicitors for the Plaintiffs (Appellants).

No. 73.

Order Dismissing Application to Exclude Certain Evidence and Exhibits from Record.

*In the
Supreme
Court of
Alberta
(Appellate
Division)*

IN THE SUPREME COURT OF ALBERTA, APPELLATE DIVISION

Before The Honourable The Chief Justice The Honourable Mr. Justice Clarke The Honourable Mr. Justice Mitchell The Honourable Mr. Justice Lunney The Honourable Mr. Justice McGillivray	}	Monday the 14th day of January, A.D. 1935.
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No. 73
Order
dismissing
application
to exclude
certain
evidence
and Ex-
hibits
from
Record.
14th Janu-
ary, 1935.

- 10 Upon the application of the Defendant (Respondent) for directions as to the preparation and contents of the Record herein and in particular for a direction that certain evidence as in the notice of application set out be excluded from the said Record as not relevant to the subject matter of the appeal being taken herein to the Judicial Committee of the Privy Council, made in presence of Counsel for the Plaintiffs (Appellants), upon hearing read the affidavit of Ronald Martland filed and the exhibits therein referred to and the relevant portion of the Appeal Book in this Court, and upon hearing what was alleged by Counsel aforesaid;
- 20 This Court Doth Order that the said application be and the same is hereby dismissed with costs payable by the Defendant (Respondent) to the Plaintiffs (Appellants) forthwith after taxation thereof.

“R. P. WALLACE”
R.

Entered this 23rd day of
January, A.D. 1935.

“R. P. WALLACE”
C.

Approved as being the order made.

- 30 MILNER, STEER, DAFOE, POIRIER & MARTLAND,
Solicitors for the Defendant.

PART II.

EXHIBITS AND DOCUMENTS

No. 1.

**Admission of Facts By Defendant.
(Plaintiffs' Document)**

The Defendant in this cause, for the purpose of this cause only, and saving all just exceptions and objections to the admissibility of such facts or any of them as evidence in this cause, and provided that these admissions are made for the purpose of this action only, and are not admissions to be used against the Defendant in any other action, or by anyone other than the Plaintiffs in this action, hereby admits the several facts following, namely: 10

1. That the Plaintiffs named in the Style of Cause before the Corona Hotel Company, Limited, are Fire Insurance Companies and are entitled to and do carry on business in Alberta.

2. That Corona Hotel Company, Limited did own and operate the Corona Hotel on the south side of Jasper Avenue, Edmonton, and did carry insurance against loss and damage by fire, including loss and damage from explosion of natural gas.

3. That the pipes and mains of the Defendant were constructed for the Defendant by certain contractors acting under contract with the Defendant. 20

4. That the Corona Hotel was destroyed by fire on the 21st of February, 1932.

5. That the Corona Hotel Company, Limited held policies of insurance as mentioned in Paragraph 8 of the Statement of Claim.

6. That the Plaintiffs Insurance Companies mentioned in Paragraph 8 of the Statement of Claim did respectively receive assignments in writing from Corona Hotel Company, Limited.

7. That written notice of such assignments was given by the Plaintiffs to the Defendant. 30

8. That Motor Car Supply Company, Limited held policies of insurance as mentioned in Paragraph 13 of the Statement of Claim.

9. That the Plaintiffs Insurance Companies mentioned in Paragraph 13 of the Statement of Claim did respectively receive assignments in writing from Motor Car Supply Company, Limited.

10. That written notice of such assignments was given by the Plaintiffs to the Defendant.

11. That Thornton, Perkins Company held policies of insurance as mentioned in Paragraph 18 of the Statement of Claim.

12. That the Plaintiffs Insurance Companies mentioned in Paragraph 18 of the Statement of Claim did respectively receive assignments in writing from Thornton, Perkins Company.

13. That written notice of such assignments was given by the Plaintiffs to the Defendant.

10 14. That Empire Building Company, Limited, held policies of insurance as mentioned in Paragraph 23 of the Statement of Claim.

15. That the Plaintiffs Insurance Companies mentioned in Paragraph 23 of the Statement of Claim did respectively receive assignments in writing from Empire Building Company, Limited.

16. That written notice of such assignments was given by the Plaintiffs to the Defendant.

17. That Israel Clement held a policy of insurance in the Yorkshire Insurance Company, Limited as mentioned in Paragraph 28 of the Statement of Claim.

20 18. That the Yorkshire Insurance Company, Limited mentioned in Paragraph 28 of the Statement of Claim did receive an assignment in writing from Israel Clement.

19. That written notice of such assignment was given by the Plaintiffs to the Defendant.

20. That Julia Prokos held a policy of insurance in the Saskatchewan Farmer's Mutual Fire Insurance Company, as mentioned in Paragraph 33 of the Statement of Claim.

30 21. That the Saskatchewan Farmer's Mutual Fire Insurance Company mentioned in Paragraph 33 of the Statement of Claim did receive an assignment in writing from Julia Prokos.

22. That written notice of such assignment was given by the Plaintiffs to the Defendant.

23. That Mrs. Lucy Hawkins held a policy of insurance in the Fire Association of Philadelphia, as mentioned in Paragraph 38 of the Statement of Claim.

24. That the Fire Association of Philadelphia mentioned in Paragraph 38 of the Statement of Claim did receive an assignment in writing from Mrs. Lucy Hawkins.

Exhibits
and
Documents

—
No. 1.
Admission
of Facts
by
Defendant.
8th
November
1933.
continued.

Exhibits
and
Documents.

No. 1.
Admission
of Facts
by
Defendant.
8th
November
1933.
continued.

25. That written notice of such assignment was given by the Plaintiffs to the Defendant.

26. That Florence Jane Teets held a policy of insurance in Queen Insurance Company as mentioned in Paragraph 43 of the Statement of Claim.

27. That the Queen Insurance Company mentioned in Paragraph 43 of the Statement of Claim did receive an assignment in writing from Florence Jane Teets.

28. That written notice of such assignment was given by the Plaintiffs to the Defendant. 10

29. That George R. F. Kirkpatrick and Messrs. McDougall & Secord held policies of Insurance as mentioned in Paragraph 48 of the Statement of Claim.

30. That the Plaintiffs Insurance Companies mentioned in Paragraph 48 of the Statement of Claim did respectively receive assignments in writing from George R. F. Kirkpatrick and Messrs. McDougall & Secord.

31. That written notice of such assignment was given by the Plaintiffs to the Defendant.

32. That the said Kirkpatrick and McDougall & Secord Limited held a policy of insurance in London and Lancashire Insurance Company as mentioned in Paragraph 50 of the Statement of Claim. 20

33. That the London and Lancashire Insurance Company, Limited, as mentioned in Paragraph 50 of the Statement of Claim did receive assignments in writing from G. R. F. Kirkpatrick and McDougall & Secord, Limited.

34. That written notice of such assignment was given by the Plaintiffs to the Defendant.

35. That W. H. Rowland and Carl Weiman held a policy of Insurance in the Provincial Insurance Company Limited, as mentioned in Paragraph 55 of the Statement of Claim. 30

36. That the Provincial Insurance Company mentioned in Paragraph 55 of the Statement of Claim did receive an assignment in writing from W. H. Rowland and Carl Weiman.

37. That written notice of such assignment was given by the Plaintiffs to the Defendant.

38. That W. C. Smith held a policy of insurance in Provincial Insurance Company, Limited, as mentioned in Paragraph 59 of the Statement of Claim.

39. That the Provincial Insurance Company, Limited, mentioned in Paragraph 59 of the Statement of Claim did receive an assignment in writing from W. C. Smith.

40. That written notice of such assignment was given by the Plaintiffs to the Defendant.

41. That Mrs. M. A. Ferguson held a policy of insurance in the Merchant's Marine Insurance Company, Limited, as mentioned in Paragraph 63 of the Statement of Claim.

10 42. That the Merchant's Marine Insurance Company, Limited mentioned in Paragraph 63 of the Statement of Claim did receive an assignment in writing from Mrs. M. A. Ferguson.

43. That written notice of such assignment was given by the Plaintiffs to the defendant.

44. That the Honourable Lillian Elphinstone held policies of insurance as mentioned in Paragraphs 68, 70 and 72 of the Statement of Claim.

45. That the Plaintiffs Insurance Companies mentioned in Paragraphs 68, 70 and 72 of the Statement of Claim did respectively receive assignments in writing from the Honourable Lillian Elphinstone.

20 46. That written notice of such assignments was given by the Plaintiffs to the Defendant.

47. That Alfred Brown held a policy of insurance in the British Colonial Fire Insurance Company, Limited as mentioned in Paragraph 77 of the Statement of Claim.

48. That the British Colonial Fire Insurance Company, Limited mentioned in Paragraph 77 of the Statement of Claim did receive an assignment in writing from Alfred Brown.

49. That written notice of such assignment was given by the Plaintiffs to the Defendant.

30 50. That John Jacobs held policies of insurance as mentioned in Paragraph 82 of the Statement of Claim.

51. That the Plaintiffs Insurance Companies mentioned in Paragraph 82 of the Statement of Claim did respectively receive assignments in writing from John Jacobs.

52. That written notice of such assignment was given by the Plaintiffs to the Defendant.

53. That Canada Permanent Trust Company and H. T. Emery, executors of the estate of E. C. Emery, deceased, held a policy in the Royal Insurance Company, Limited, as mentioned in Paragraph 87 of the Statement of Claim.

Exhibits
and
Documents.

—
No. 1.
Admission
of Facts
by
Defendant.
8th
November
1933.
continued.

Exhibits
and
Documents

—
No. 1.
Admission
of Facts
by
Defendant.
8th
November
1933.
continued.

54. That the Royal Insurance Company Limited mentioned in Paragraph 87 of the Statement of Claim did receive an assignment in writing from Canada Permanent Trust Company and H. T. Emery, executors of the Estate of E. C. Emery deceased.

55. That written notice of such assignment was given by the Plaintiffs to the Defendant.

56. That Edwin Ernest Kerswell held a policy of insurance in the Winnipeg Fire Underwriters Agency as mentioned in Paragraph 91 of the Statement of Claim.

57. That Winnipeg Fire Underwriters Agency mentioned in Paragraph 91 of the Statement of Claim did receive an assignment from Edwin Ernest Kerswell. 10

58. That written notice of such assignment was given by the Plaintiffs to the Defendant.

59. That William Sinclair held a policy of insurance in the Globe Underwriters Agency as mentioned in Paragraph 96 of the Statement of Claim.

60. That the Globe Underwriters Agency mentioned in Paragraph 96 of the Statement of Claim did receive an assignment in writing from William Sinclair. 20

61. That written notice of such assignment was given by the Plaintiffs to the Defendant.

62. That J. W. S. Chappelle held a policy of insurance in the Provincial Insurance Company, Limited, as mentioned in Paragraph 99 of the Statement of Claim.

63. That the Provincial Insurance Company, Limited, mentioned in Paragraph 99 of the Statement of Claim did receive an assignment in writing from J. W. S. Chappelle.

64. That written notice of such assignment was given by the Plaintiffs to the Defendant. 30

65. That T. Sinton held a policy of insurance in Glens Falls Insurance Company, as mentioned in Paragraph 103 of the Statement of Claim.

66. That the Glens Falls Insurance Company, mentioned in Paragraph 103 of the Statement of Claim, did receive an assignment in writing from T. Sinton.

67. That written notice of such assignment was given by the Plaintiffs to the Defendant.

68. That Sherwin Williams Company of Canada, Limited, held policies of insurance as mentioned in Paragraph 108 of the Statement of Claim.

69. That the Plaintiffs Insurance Companies mentioned in Paragraph 108 of the Statement of Claim did respectively receive assignments in writing from Sherwin Williams Company of Canada Limited.

70. That written notice of such assignments was given by the Plaintiffs to the Defendant.

71. That Credit Foncier Franco-Canadienne Company held policies
10 of insurance as mentioned in Paragraph 113 of the Statement of Claim.

72. That the plaintiffs Insurance Companies mentioned in Paragraph 113 of the Statement of Claim did respectively receive assignments in writing from Credit Foncier Franco-Canadienne Company.

73. That written notice of such assignments was given by the Plaintiffs to the Defendant.

74. That Coughlan and Carroll held a policy of insurance in British Colonial Fire Insurance Company as mentioned in Paragraph 117 of the Statement of Claim.

75. That the British Colonial Fire Insurance Company mentioned in
20 Paragraph 117 of the Statement of Claim, did receive an assignment in writing from Coughlan and Carroll.

76. That written notice of such assignment was given by the Plaintiffs to the Defendant.

77. That Firestone Tire & Rubber Company of Canada Limited held policies of insurance as mentioned in Paragraph 121 of the Statement of Claim.

78. That the Plaintiffs Insurance Companies mentioned in Paragraph 121 of the Statement of Claim, did respectively receive assignments in writing from Firestone Tire & Rubber Company of Canada Limited.

79. That written notice of such assignments was given by the Plaintiffs to the Defendant.
30

80. That McDougall & Secord Limited, held a policy of insurance in London and Lancashire Insurance Company, Limited, as mentioned in Paragraph 125 of the Statement of Claim.

81. That the London and Lancashire Insurance Company Limited, mentioned in Paragraph 125 of the Statement of Claim, did receive an assignment in writing from McDougall & Secord Limited.

Exhibits
and
Documents

—
No. 1.
Admission
of Facts
by
Defendant.
8th
November
1933.

continued.

Exhibits
and
Documents.

82. That written notice of such assignment was given by the Plaintiffs to the Defendant.

No. 1.
Admission
of Facts
by
Defendant.
8th
November
1933.
continued.

DATED at Edmonton Alberta, this 8th day of November, A.D. 1933, and delivered by Messrs. Milner, Dafoe, Poirier and Martland, Royal Bank of Canada Chambers, Edmonton, Alberta, Solicitors for the Defendant.

TO:

MESSRS. WOODS, FIELD, CRAIG & HYNDMAN,
Solicitors for the Plaintiff.

No. 90.
Notice by
Defendant
to Plaintiffs
to Admit
and Replies
Thereto.
8th
November
1933.

No. 90.

10

Notice by Defendant to Plaintiffs to Admit and Replies Thereto.

(Defendant's Document).

TAKE NOTICE that you are required to admit for the purpose of this action the following facts:

1. That the following plaintiffs respectively were users of natural gas distributed by the Defendant by virtue of contracts made between the said Plaintiffs respectively and the Defendant; Corona Hotel Company, Limited, J. Jacobs, A. Brown, G. R. F Kirkpatrick and McDougall & Seccord Limited, Empire Building Company, Limited, Mrs. Lucy Hawkins, J. Thornton, L. Perkins, I. Clement and Canada Permanent Trust Company and H. T. Emery, Executors of the estate of E. C. Emery, deceased, and that each of the said plaintiffs respectively were using natural gas distributed by the Defendant prior to and on the 21st day of February, A.D. 1932. 20

2. That each of the said Plaintiffs mentioned in Paragraph 1 of this Notice respectively was well aware that no odorant or chemical was mixed with the natural gas distributed at the time that such contracts were made.

DATED at the City of Edmonton, in the Province of Alberta, this 8th day of November, A.D. 1933, and delivered by Messrs. Milner, Dafoe, Poirier & Martland, Royal Bank of Canada Chambers, Edmonton, Alberta, Solicitors for the Defendant. 30

To Messrs. Woods, Field, Craig & Hyndman,
Barristers, etc.
316 McLeod Building, Edmonton, Alberta.,
Solicitors for the Plaintiffs.

Edmonton, Alberta,
November 23rd, 1933.

Exhibits
and
Documents.

Messrs. Milner, Dafoe, Poirier & Martland,
Barristers, etc.,
Edmonton, Alberta.

No. 90.
Notice by
Defendant
to Plaintiffs
to Admit
and Replies
Thereeto.

Dear Sirs:

Re London Guarantee & Accident & Northwestern Utilities Limited

Referring to the Notice to Admit dated November 8th, 1933, served
on us, we have written to the several parties mentioned in the notice for
10 information upon the matters therein mentioned and beg to report as fol-
lows:

23rd
November
1933.
continued.

Re Corona Hotel Company Limited. The officers of this Company
have been examined for discovery.

Re J. Jacobs. We enclose copy of letter received from Mr. Jacobs.

Re A. Brown. We have not been able to get in touch with this party.

Re G. R. F. Kirkpatrick. We enclose copy of letter received from Mr.
Kirkpatrick.

Re McDougall & Secord Limited. We enclose copy of letter received
from McDougall & Secord Limited.

20 Re Empire Building Company Limited and re Lucy Hawkins. We
enclose copy of letter received from Messrs. Friedman, Lieberman &
Newson on behalf of these parties.

Re A. Thornton and L. Perkins, Mr. Perkins called on the writer and
stated that his wife L. Perkins has a contract by way of ordinary appli-
cation for gas in connection with her house No. 7308 - 105A Street on the
south side; Mr. Perkins, namely Alfred Perkins, has no contract with the
Gas Company, nor have Messrs. Thornton & Perkins, of which he is one
of the partners. Mrs. Perkins (L. Perkins) has never directed her mind
to the question as to an odorant, nor has Mr. Perkins.

30 Re I. Clement. We enclose copy of letter received from this party.

Re Canada Permanent Trust Company and H. T. Emery. We enclose
copy of letter received from H. T. Emery, one of the executors of the
estate of E. C. Emery, deceased,

The Statements mentioned herein and in the letters, copies of which
we enclose are intended to be answers to your Notice to Admit and may
be so used by you.

Yours truly,

WOODS, FIELD, CRAIG & HYNDMAN,
per

Exhibits
and
Documents

No. 90.
Notice by
Defendant
to Plaintiffs
to Admit
and Replies
Thereeto.

20th
November
1933.
continued.

Edmonton, Alberta,
Nov. 20th, 1933.

Woods, Field, Craig & Hyndman,
City.

Re File 1-34819.

Gentlemen:

In reference to your letter of the 18th inst., we wish to inform you that we were using natural gas prior to 21st Feb., 1932.

We knew at the time when we made application for gas some years ago that there was no odorant or chemical mixed with it, but we understood that some kind of odorant is mixed with the gas now. 10

We wish to point out that the above letter applies only to the Edmonton Furriers and not to the writer's personal home, as he lives in a block and has no connections in that manner with the Gas Company.

Yours truly,

"JOHN JACOBS."

Edmonton, Alberta,
November 20th, 1933.

Messrs. Woods, Field, Craig & Hyndman,
Edmonton, Alberta.

20

Dear Sirs:

Re London Guarantee & Accident Company Limited v. Northwestern Utilities, Limited.

I am in receipt of your letter of the 18th instant (File No. 1-34819).

I was always under the impression that there was no odorant or chemical mixed with the natural gas when we made application for gas service, the same applies to my own residence. I do not know whether I was told but I always understood that there was no odorant or chemical mixed with the gas.

Yours truly,

30

"G. R. F. KIRKPATRICK."

Edmonton, Alberta.
November 21, 1933.

Exhibits
and
Documents

Woods, Field, Craig & Hyndman,
McLeod Building, City.

—
No. 90.
Notice by
Defendant
to Plaintiffs
to Admit
and Replies
Thereeto.
21st and
22nd
November
1933.
continued.

Dear Sirs:

In reply to your letter of the 18th, we would say that we were using natural gas prior to February 21st, 1932, distributed by the Gas Company, but cannot say whether it was by virtue of a contract or by ordinary application.

10 We do not know if there was odorant or chemical in the natural gas at the time we applied.

Yours truly,

McDOUGALL & SECORD LIMITED.
"J. C. McDOUGALL,"
Manager.

Edmonton, Alberta,
22nd November, 1933.

Messrs. Woods, Field, Craig & Hyndman,
Barristers, etc.,

20 Macleod Building, Edmonton, Alberta.

Dear Sirs:

Re Corona Hotel Action and re Empire Building and Lucy Hawkins,
Thornton & Perkins and L. Clement.

The above parties have requested us to reply to yours of the 18th instant.

None of them had any knowledge that no odorant or chemical was mixed with the gas. In fact, none of them gave the matter any thought.

30 None of the parties used gas, except Empire Building and Lucy Hawkins. These last two parties signed applications in the usual form, W. H. Hawkins signing for his wife, Lucy Hawkins. We are enclosing a copy of the application signed by Empire Building Co., Ltd. The rules and regulations referred to in the application were never received by either Empire Building Co., Ltd. or Hawkins.

Yours truly,

FRIEDMAN, LIEBERMAN & NEWSON,
per "F."

Edmonton,
November 20th, 1933.

Exhibits
and
Documents.

No. 90.
Notice by
Defendant
to Plaintiffs
to Admit
and Replies
Thereeto.
20th and
23rd
November
1933.
continued.

Woods, Field, Craig & Hyndman,
314-319 McLeod Bldg., Edmonton.

Dear Sirs:

Re File 1-34819.

Answering your favour of 18th inst. I wish to say, that I have never used natural gas as supplied by Northwestern Utilities Ltd. Have no contract with them to supply gas to this establishment, nor have I made any application at any time to have gas installed, on the premises occupied by me and operated under the name of Beauchamp's. 10

Yours truly,

"I. CLEMENT."

23rd November, 1933.

Messrs. Woods, Field, Craig & Hyndman,
Barristers, etc., Edmonton.

Dear Sirs:

Re London Guarantee & Accident Co. Ltd., vs. Northwestern Utilities Limited, Your File 1-34819.

I have your letter of the 18th inst. addressed to The Canada Permanent Trust Company and myself as Executors of the Estate of E. C. Emery, deceased. 20

As I was not personally aware of the facts in regard to the execution of a contract with the Gas Company covering the supply of gas to the premises at 10044 - 106th Street, I made inquiries at the office of the Gas Company and there learned that the only contract on file is one between the company and my father, made some time in 1923, I do not know whether or not my father had in mind the question of an odorant in the natural gas at the time of the execution of the contract.

My father died on the 13th of February, 1924 and until May, 1927 I resided at the said premises with my mother. During that period I do not think the question of an odorant in the natural gas ever occurred to me or my mother. From May, 1927 until 21st February, 1932, I was frequently in the house, occasionally staying there for short visits, and again do not think that during the period the question of an odorant in the gas ever occurred to me. I cannot remember ever directing my mind to the question, and while I cannot speak positively about my mother's position, I believe the same applies to her. 30

Yours truly,

"H. T. EMERY."

Edmonton, Alberta,
November 25th. 1933.

Exhibits
and
Documents.

Messrs. Milner, Dafoe, Poirier & Martland,
Barristers, etc., Edmonton, Alberta.

Dear Sirs:

Re London Guarantee & Accident Co. Ltd. v. Northwestern Utilities Ltd.

Further with reference to your notice to admit we enclose copy of letters of Wallbridge, Cairns & Company referring to the notice sent by us to the Corona Hotel Company Limited.

10

Yours truly,

WOODS, FIELD, CRAIG & HYNDMAN.
per

—
No. 90.
Notice by
Defendant
to Plaintiffs
to Admit
and Replies
Thereeto.
25th and
24th
November
1933.
continued.

November 24th, 1933.

Attention Mr. Woods.

Messrs. Woods, Field, Craig & Hyndman,
Barristers, etc.,
McLeod Building, Edmonton, Alberta.

Dear Sirs:

Re London Guarantee & Accident Co Ltd. v. Northwestern Utilities Ltd.

20

Referring to your letter of the 18th inst. addressed to the Corona Hotel Company in our care, we find that there is a contract between the Gas Company and the Hotel Company which is no doubt the contract made at the time of the original installation following the practice adopted by the company, but whether it was in force on the 21st of February, 1932 we are unable to say. The document was not brought in to us but we have asked for it and will hand it to you as soon as received.

30

As to your other question regarding odorant the Company had no information either at the time of the installation or subsequently as to whether an odorant was intended to be used or was being used. There was nothing to direct the attention of the officers of the company to that question and it did not occur to any one to enquire. The fact that no odor had ever been noticed would have suggested, if it suggested anything at all, that the installation was free from leakage as very few people were aware that the gas did not have a natural odor, and no doubt there are a great many who are not yet aware of that fact.

Yours truly,

WALLBRIDGE, CAIRNS & COMPANY,
per "W"

Exhibits
and
Documents

Edmonton, Alberta,
November 28th, 1933.

No. 90.
Notice by
Defendant
to Plaintiffs
to Admit
and Replies
Thereeto.
28th and
27th
November
1933.
continued.

Messrs. Milner, Dafoe, Poirier & Martland,
Barristers, etc., Edmonton, Alberta.

Re London Guarantee & Accident v. Northwestern Utilities Ltd.

Dear Sirs:

We enclose copy of further letter from Messrs. Wallbridge, Cairns & Company in connection with the matter of the Notice to Admit which you served. As stated by them, will you kindly regard the first paragraph of their former letter to us as having been withdrawn. 10

Yours truly,

WOODS, FIELD, CRAIG & HYNDMAN,

per

COPY.
A-9692.

November 27th, 1933.

Messrs. Woods, Field, Craig & Hyndman,
Barristers, etc.,
McLeod Building, Edmonton, Alberta.

Re London Guarantee & Accident Co. Ltd. vs. Northwestern Utilities Ltd. 20

Dear Sirs:

With further reference to your letter of the 18th inst. to Corona Hotel Company Limited, in our reply of the 24th inst. and particularly the first paragraph of that reply, we beg to say that we obtained the information regarding the contract between the Gas Company and the Hotel Company from Mr. L. Wize, but today Mr. Henderson reminded us that the matter of the contract was referred to on his examination for discovery, and what purported to be a contract was produced to him. It was signed by one Dyer (we think that is the name) purporting to act on behalf of the Hotel Company but he had no authority to do so and Mr. Henderson pointed that out in his evidence. As far as we can ascertain 30

that is the only contract, if it is a contract, and if the Hotel Company had an original or a duplicate it must have been destroyed in the fire as it has not been found.

In view of the fact that this matter was dealt with on Mr. Henderson's examination for discovery we do not think that the defendant's solicitors were justified in making further enquiry and so if you have answered the enquiry in view of our letter of the 24th inst. we trust that you will withdraw it.

Yours truly,

10 WALLBRIDGE, CAIRNS & COMPANY,
per "J. E. WALLBRIDGE."

Exhibits
and
Documents
—

No. 90.
Notice by
Defendant
to Plaintiffs
to Admit
and Replies
Thereeto.

27th
November
1933.

continued.

No. 92A.

**Indenture made between The Northern Alberta Natural Gas Development
Company Limited and the Northwestern Utilities Limited.
(Defendant's Document)**

No. 92A.
Indenture
made
between
The
Northern
Alberta
Natural Gas
Develop-
ment
Company
Limited
and
North-
western
Utilities
Limited,
29th May
1923.

continued.

COPY.

THIS INDENTURE made in triplicate this twenty-ninth day of May, A.D. 1923.

BETWEEN:

20 THE NORTHERN ALBERTA NATURAL GAS DEVELOPMENT
COMPANY, LIMITED,

a corporation organized under the laws of the Province of Alberta, hereinafter called "the Vendor,"

of the First Part,

—and—

NORTHWESTERN UTILITIES LIMITED,

a Company incorporated under the provisions of the Companies Act of the Dominion of Canada, hereinafter called "The Purchaser,"

30

of the Second Part.

WHEREAS the Vendor is incorporated under The Companies Ordinance of the North West Territories and amending Ordinances of the

Exhibits
and
Documents.

No. 92A.
Indenture
made
between
The
Northern
Alberta
Natural Gas
Develop-
ment
Company
Limited
and
North-
western
Utilities
Limited,
29th May
1923.

continued.

Legislature of the said North West Territories and Acts of the Legislative Assembly of the Province of Alberta, and is authorized and empowered to sell or dispose of its undertaking for such consideration as the Vendor may think fit, and in particular for shares or securities of any other Company:

AND WHEREAS by Agreement dated the twenty-ninth day of May, A.D. 1923, the Vendor agreed to sell all its real and personal estate, property and effects except as in the said agreement stated to Everett James Chambers, of the City of Calgary, in the Province of Alberta, Solicitor, and to convey and transfer to the said Everett James Chambers, or his nominee or nominees in writing named, all its assets free from all liabilities except liabilities for current taxes, rates, assessments, royalties and other like items accruing due in respect of its assets aforesaid and floating liabilities, the whole not to exceed in the aggregate the sum of eighty-five thousand dollars: 10

AND WHEREAS by an instrument in writing dated this twenty-ninth day of May, A.D. 1923, the said Everett James Chambers has nominated the Purchaser herein as his nominee to which the Vendor should transfer and convey the said real and personal property, effects and assets as aforesaid: 20

NOW THEREFORE THIS AGREEMENT WITNESSETH:

1. That in pursuance of the said agreements and in consideration of the Purchaser causing to be delivered to the Vendor ten thousand fully paid and non-assessable shares, having no par value, of the Common stock of Canadian Utilities Limited, a Company incorporated under the provisions of The Companies Act of the Dominion of Canada, to be distributed amongst the present shareholders of the Vendor as the said shareholders may determine and the assumption by the Purchaser of the floating debts and obligations of the Vendor to the extent of eighty-five thousand dollars and no more, and the payment of all expenses incurred by the Vendor subsequent to the date of this conveyance in connection with the carrying into effect of the proposed scheme for the reorganization of the Vendor and the distributing among its shareholders of the Common shares of Canadian Utilities Limited aforesaid arising out of or connected with any of the said transactions, the Vendor hath bargained, sold, assigned, transferred and set over, and by these presents doth bargain, sell, assign, transfer and set over unto the Purchaser, its successors and assigns: 30

- (a) All the assets and undertaking of the Vendor as the same is now carried on in the Province of Alberta and the good will of the business of the Vendor. 40

(b) All the lands, interests in lands, gas leases, gas and oil rights, franchises, plant, machinery and equipment of the Vendor wheresoever situate.

(c) All the book and other debts due to the Vendor and all its rights, claims and securities in respect of the said debts and the benefit of all contracts, franchises and engagements.

(d) All other property and assets of the Vendor, including every asset of the Vendor of every description wheresoever situate.

10 And all the right, title, interest, property, claim and demand whatsoever of the Vendor of, in, to and out of the said property, goods, chattels and effects and every part thereof; TO HAVE AND TO HOLD the said hereinbefore assigned property, goods, chattels and effects and every part thereof, with the appurtenances and all the right, title and interest of the Vendor thereto and therein as aforesaid, unto and to the use of the Purchaser, its successors and assigns to and for its and their sole and only use and benefit forever.

20 AND the Vendor doth hereby, for itself, its successors and assigns, covenants, promises and agrees with the Purchaser, its successors and assigns, that it now is rightfully and absolutely possessed of and entitled to the said hereinbefore assigned property, goods, chattels and effects and every part thereof, and that it has good right to assign the same unto the Purchaser, its successors and assigns in the manner aforesaid and according to the true intent and meaning of these presents, and that the Purchaser, its successors and assigns shall and may from time to time and at all times hereafter peaceably and quietly have, hold, possess and enjoy the said hereby assigned property, goods, chattels and effects and every part thereof to and for its own use and benefit without any manner of hindrance, interruption, molestation, claim or demand whatsoever of, from or by the Vendor or any other person or persons
30 whomsoever, and that free and clear, and freely and absolutely released and discharged, or otherwise at the cost of the Purchaser, effectually indemnified from and against all former and other bargains, sales, gifts, grants, titles, charges and encumbrances whatsoever except with respect to debts and obligations not exceeding the sum of eighty-five thousand dollars as hereinbefore provided.

2. The Vendor further covenants and agrees that it shall and will, and all persons rightfully claiming or to claim any estate, right, title or interest of, in or to the said hereby assigned property, goods, chattels and effects, and every part thereof, shall and will from time to time and
40 at all times hereafter upon every reasonable request of the Purchaser, its successors and assigns, at the cost and charges of the Purchaser, make, do and execute, or cause or produce to be made, done, and executed, all such further acts, deeds and assurances for the more effectually assign-

Exhibits
and
Documents.

No. 92A.
Indenture
made
between
The
Northern
Alberta
Natural Gas
Develop-
ment
Company
Limited
and
North-
western
Utilities
Limited,
29th May
1923.

continued.

Exhibits and Documents

No. 92A. Indenture made between The Northern Alberta Natural Gas Development Company Limited and Northwestern Utilities Limited, 29th May 1923. continued.

ing and assuring the said hereby assigned property, goods, chattels and effects unto the Purchaser, its successors and assigns in the manner aforesaid, and according to the true intent and meaning of these presents as by the Purchaser, its successors and assigns, or its counsel, shall be reasonably advised or required.

3. It is hereby agreed between the Vendor and the Purchaser that this sale shall take effect as from the first day of June, A.D. 1923, and that the Vendor shall, from the said date, be deemed to be carrying on the said business on behalf of the Purchaser, and shall account to the Purchaser, and be indemnified accordingly.

10

4. This conveyance is made subject to the approval of the Board of Public Utility Commissioners of the Province of Alberta.

IN WITNESS WHEREOF the Vendor and the Purchaser have caused their respective corporate seals to be affixed hereto and these presents to be executed by their duly authorized officers in that behalf.

SIGNED, SEALED AND DELIVERED by the Northern Alberta Natural Gas Development Company Limited in the presence of H. G. Nolan, by NORTHWESTERN UTILITIES LIMITED, in the presence of Lillian Dillon.

The Northern Alberta Natural Gas Development Company, Limited, "T. A. McAuley," Pres. (SEAL) "C. E. Morris." Asst. (SEAL) NORTHWESTERN UTILITIES LIMITED, by Clifford E. Kitchen, President, M. A. Corbett, Secretary. (SEAL)

20

I, EVERETT JAMES CHAMBERS, of the City of Calgary in the Province of Alberta, solicitor, the Purchaser named in a certain agreement dated the Twenty-ninth day of May, 1923, made between the Northern Alberta Natural Gas Development Company Limited, a corporation organized under the laws of the Province of Alberta, as Vendor, and me, the said Everett James Chambers as Purchaser, in pursuance of the powers therein conferred upon me, do hereby nominate Northwestern Utilities Limited as my nominee to whom the Northern Alberta Natural Gas Development Company Limited shall transfer all its real and personal property, assets and effects in accordance with the terms and provisions of the said agreement.

30

DATED at Calgary, Alberta, this 29th day of May, A.D. 1923.

Witness, "A. E. Millar."

"Everett James Chambers."

40

CANADA
PROVINCE OF ONTARIO
TO WIT:

Exhibits
and
Documents
—

No. 92A.
Indenture
made
between
The
Northern
Alberta
Natural Gas
Develop-
ment
Company
Limited
and
North-
western
Utilities
Limited,
29th May
1923.
continued.

I, Lillian Dillon, of the City of Toronto, in the Province of Ontario, stenographer, make oath and say:

1. That I was personally present and did see the corporate seal of Northwestern Utilities Limited affixed to the within Bill of Sale and the said bill of sale duly executed by Clifford Earl Kitchen, President, and Mary Alice Corbett, Secretary of the said Company, and that I, this de-
10 ponent am a subscribing witness to the same, and the name "Lillian Dillon" set and subscribed to the execution thereof is of the proper hand-writing of me this deponent, and the same was executed at the City of Toronto, in the Province of Ontario, on this 18th day of June, A.D. 1923.

2. That I know the said Clifford Earl Kitchen and Mary Alice Corbett and they are each in my belief of the full age of twenty-one years.

SWORN before me at the City of }
Toronto, in the Province of On- } "LILLIAN DILLON."
tario, this 18th day of June, A.D. }
1923. }

20 "D. J. COFFEY,"
A Notary Public in and for the Province of Ontario. (SEAL)

CANADA
PROVINCE OF ONTARIO
TO WIT:

I, Clifford Earl Kitchen of the City of Toronto in the Province of Ontario, President of the Purchaser in the foregoing bill of sale named, make oath and say:

1. That the sale therein made is bona fide and for the consideration therein set forth, and is not for the purpose of holding or enabling the Purchaser to hold the property, goods, chattels and effects mentioned
30 therein against the creditors of the Vendor therein named.

SWORN before me at the City of }
Toronto, in the Province of On- } "CLIFFORD E. KITCHEN."
tario, this 18th day of June, A.D. }
1923. }

"D. J. COFFEY,"
A Notary Public in and for the Province of Ontario. (SEAL)

Exhibits
and
Documents.

No. 92A.
Indenture
made
between
The
Northern
Alberta
Natural Gas
Develop-
ment
Company
Limited
and
North-
western
Utilities
Limited,
29th May
1923.
continued.

CANADA
PROVINCE OF ALBERTA
TO WIT:

I, Henry Grattan Nolan, of the City of Calgary in the Province of Alberta, barrister-at-law, make oath and say:

1. That I was personally present and did see the corporate seal of the Northern Alberta Natural Gas Development Company Limited affixed to the within bill of sale and the said bill of sale duly executed by T. A. McAuley, President and C. E. Morris, Assistant Secretary of the said company, and that I, this deponent am a subscribing witness to the same, and the name "H. G. Nolan" set and subscribed to the execution thereof is of the proper handwriting of me this deponent, and that the same was executed at the City of Calgary, in the Province of Alberta, on this fifteenth day of June, A.D. 1923. 10

2. That I know the said T. A. McAuley and the said C. E. Morris, and they are each in my belief of the full age of twenty-one years.

SWORN before me at the City of
Calgary in the Province of Al-
berta, this 15th day of June, A.D.
1923. }

"H. G. NOLAN."

20

"G. W. H. Millican,"

A Commissioner for oaths in and for the Province of Alberta.

No. 6.
Agreement between Northwestern Utilities Limited and Williams Brothers for Construction of Gas Distribution System and Specifications.
(Plaintiffs' Document.)

Exhibits
and
Documents.

No. 6.
Agreement
between
North-
western
Utilities
Limited
and
Williams
Brothers
for Con-
struction
of Gas
Distribution
System
and
Specifica-
tions,
22nd June
1923.

THIS INDENTURE made this twenty-second day of June A. D. 1923.

BETWEEN:

10 S. M. Williams, Jr., and D. R. Williams, Contractors, of Tulsa, in the State of Oklahoma, who carry on business in partnership under the firm name of WILLIAMS BROTHERS (hereinafter called "the Contractor,")

OF THE ONE PART,

—and—

NORTHWESTERN UTILITIES, LIMITED, a body corporate (hereinafter called "the Company,")

OF THE OTHER PART;

WHEREAS by an agreement dated the day of November, 1915, The Northern Alberta Natural Gas Development Company, Limited, acquired franchise rights for the supplying of natural gas within the
20 City of Edmonton, which franchise rights are now held by the Company under assignment from The Northern Alberta Natural Gas Development Company, Limited, and which agreement is scheduled to Chapter 29 of the Statutes of Alberta for the year 1916, being "An Act to validate and confirm a certain by-law and agreement of the City of Edmonton, in the Province of Alberta, granting a franchise to Northern Alberta Natural Gas Development Company, Limited, for supplying gas to the said city and the inhabitants thereof, and to authorize the said Company to construct certain gas pipe lines and works in the Province of Alberta." and
30 it is now intended that pursuant to the said franchise agreement and the powers conferred by the said Statute a right of way shall be secured for the construction of and that a ten and twelve inch steel pipe line, approximately seventy-eight (78) miles in length, shall be constructed, extending from a point in or near Section one (1), Township forty-nine (49), Range thirteen (13), West of the Fourth Meridian, to a point in the Southeastern limits of the City of Edmonton, approximately two miles from the centre of the city, the western terminal of which line is to be connected into the Company's intermediate pressure pipe line, "and that pursuant to the said franchise agreement, pipe lines for the distribu-

Exhibits
and
Documents
—

No. 6.
Agreement
between
North-
western
Utilities
Limited
and
Williams
Brothers
for Con-
struction
of Gas
Distribution
System
and
Specifica-
tions,
22nd June
1923.
continued.

tion of the said gas shall be constructed within the limits of the said city," all of which construction is to be executed and completed in the manner defined and provided in the specifications hereto annexed which are to be taken as incorporated in and forming part of this Indenture;

AND WHEREAS the Contractor has agreed to construct the said pipe line upon the terms and conditions of this agreement and in accordance with the specifications incorporated herewith;

NOW THIS INDENTURE WITNESSETH that in consideration of the covenant for payment by and on behalf of the Company hereinafter contained the Contractor hereby covenants with the Company that he, his heirs, executors or administrators, will execute and complete in a thoroughly sound and workmanlike manner the works as defined and shown in the incorporated specifications in accordance in every respect with the requirements, stipulations and conditions of this Indenture and of the said specifications; 10

2. In consideration of the covenants by the Contractor hereinbefore contained the Company covenants with the Contractor to pay to him for the execution and completion of the works as aforesaid the moneys hereinafter specified, at the times and in the manner and subject to the additions and deductions set out and declared in the said specifications; 20

3. It is agreed and declared that all the provisions of the said specifications shall be as binding upon the Contractor and upon the Company as if the same had been repeated herein and shall be read as part of these presents. Provided, however, that where there is any contradiction as between any provision in this Indenture and the specifications this Indenture shall prevail, and the generality of the provisions of this Indenture shall not be restricted by anything in the specifications contained.

4. In this Indenture and in the specifications the following expressions shall have the meanings herein assigned to them unless there is something in the subject or context repugnant to such construction: 30

"The General Manager" shall mean Mr. E. G. Hill, or other the Engineer appointed by the Company to supervise the carrying out of the contract.

"The Right of Way" shall mean the line determined upon by the Company subject to the approval of the Board of Public Utility Commissioners and the Minister of Public Works, or other necessary authority to be followed in the laying of the pipe necessary to convey gas from the Viking gas field to the City of Edmonton.

"The Works" shall mean all the works set out and described in the specifications or either of them or implied in or by the same or either of them as described in the succeeding paragraph of these presents. 40

5. The Contractor in consideration of the contract price to be paid will execute and complete all the works set out and described in the specifications, or either of them, or implied in or by the same, or either of them, the object of the contract being that the Contractor shall with all possible expedition complete and hand over to the Company the works fully completed in every respect to the satisfaction of the General Manager to be signified by certificate of completion in writing under his hand. The Contractor shall at his own expense, except where in the specifications otherwise provided, provide all the materials, plant and labor, skilled and unskilled, necessary in the opinion of the General Manager for such completion. The Contractor shall not sublet or enter into any sub-contract for the execution of the works or any of them without the consent in writing of the General Manager.

6. Save insofar as it is legally or physically impossible to execute the works in conformity with the drawings and specifications, or insofar as the General Manager in the mode hereinafter described orders variations from the works, the Contractor shall execute the works strictly in accordance with the specifications, and such further detail or specifications as the General Manager shall think necessary for the due and proper completion of the works and any deviations from the works so ordered, and the Contractor shall obey all directions given to him by the General Manager for the protection of the public or the works, but obedience to such directions on his part shall not relieve him of any liability.

7. The Contractor shall employ as many and such workmen as the General Manager shall think necessary to complete the works with all possible expedition and shall on the direction of the General Manager cease to employ on the works any workman or foreman who in the opinion of the General Manager is incompetent or negligent and shall not again employ any such workman or foreman without the consent of the General Manager. The Contractor shall at the direction of the General Manager submit any work to proper tests and shall give the General Manager and his inspectors every facility for the inspection of work and shall when required by the General Manager open up work which has been covered in. On the General Manager condemning any work the Contractor shall unless such work has already been approved by the General Manager or an Inspector immediately open up or complete such work, as the case may be, in accordance with the directions of the General Manager and the specifications.

8. The Contractor shall during all working hours have upon any part of the works where construction is being carried on a foreman or Manager and all directions and notices given by the General Manager or an Inspector appointed by him to any such foreman or Manager shall be as binding on the Contractor as though they had been given to the Contractor personally.

Exhibits
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Documents
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No. 6.
Agreement
between
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for Con-
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Specifica-
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22nd June
1923.
continued.

Exhibits
and
Documents.

No. 6.
Agreement
between
North-
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Utilities
Limited
and
Williams
Brothers
for Con-
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of Gas
Distribution
System
and
Specifica-
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22nd June
1923.
continued.

9. The Contractor shall assume all liability for and give the Company a complete indemnity against all actions or suits arising out of or in connection with the carrying out of the works whether such actions are brought by members of the public, neighboring or adjoining owners, or workmen employed on the works, save only actions for permanent interference with rights to which the works may be subject at law or in equity or otherwise arising out of the Corporation's title to the right of way. The Contractor shall in carrying out the works conform to the statutory and other legal enactments applicable to them, and in particular but without restricting the generality of the foregoing, shall comply with the Ordinances and By-laws of the City of Edmonton, and all Municipalities, Towns and Villages through which the works may be constructed. The Contractor shall forthwith insure himself in an amount and with a Company or Companies satisfactory to the General Manager against loss or damage in respect of the matters aforesaid. 10

10. The Contractor shall on being so directed by the General Manager suspend the further progress of all or any part of the works and shall not resume the execution of the same until he receives written orders from the General Manager to proceed. The Contractor shall not be entitled to claim any payment from the owner for damages arising through suspension except for overhead or contingent expenses. 20

11. On completion the Contractor shall hand over to the Company the works, together with all extra works and deviations ordered as herein provided by the General Manager, completed and finished in every respect and also produce to the Company the General Manager's final certificate that they have been completed to his satisfaction.

12. In executing the works the Contractor shall make such variations as the General Manager may direct him in writing to make, and the works with such variations shall be taken to be the works to be executed under the contract. Provided always that if the General Manager in his written order for the variations states or if the specifications provide that they are extra works then the Contractor shall be entitled unless otherwise declared to receive from the Company such payment for them in addition to the contract price as the General Manager shall by his final certificate award. The General Manager in fixing such additional payment shall have regard as far as possible to the prices set out in the specifications but his decision on the point shall be final. 30

13. Wherever in the specifications it is declared that the Contractor shall be entitled to extra payment for any work the amount thereof unless otherwise provided shall be awarded by the General Manager and the amount as so awarded by him shall be final. 40

14. No part of the final payment shall become due or payable until the Contractor has received the final certificate of completion under the

hand of the General Manager. Such certificate shall declare the amount due to the Contractor in respect to the contract price and the value of extra works added to such price and the amount previously advanced to the Contractor and the balance then due.

15. The Contractor shall immediately on producing such certificate, but not before, become entitled to receive from the Company such sum as he is shown by such certificate to be entitled to.

16. Upon the Contractor becoming bankrupt or upon an execution being levied on the Contractor's goods, or upon the General Manager certifying under his hand that in his opinion the Contractor:

- (1) has abandoned the contract, or
- (2) has suspended the progress of the works for three days after receiving from the General Manager written notice to proceed without any lawful excuse under this contract or specifications, or
- (3) has failed to make proper progress with the works for five days after receiving from the General Manager written notice to employ more men upon them, or
- (4) has failed to tear up and reconstruct any part of the work for five days after receiving from the General Manager written notice that the said works were condemned or rejected by the General Manager, or
- (5) has failed to give the General Manager proper facilities for inspecting the works or any part of them for two days after receiving from the General Manager written notice demanding the same, or
- (6) has failed to submit any work to the proper test for three days after receiving from the General Manager written notice requiring the same;

30 then the Company may enter upon the works and expel the Contractor therefrom and may themselves use the materials and plant of the Contractor for the completion of the works, and employ any other Contractor to complete or may itself complete the works and upon such entry the contract shall be determined save as to the rights and powers conferred upon the Company and the General Manager thereby. The General Manager's certificate under this clause shall be conclusive proof as between the Contractor and the Company of the statements contained in it.

17. In case the Company shall have determined the contract under

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No. 6.
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Williams
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for Con-
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of Gas
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Specifica-
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22nd June
1923.
continued

Exhibits
and
Documents
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No. 6.
Agreement
between
North-
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Utilities
Limited
and
Williams
Brothers
for Con-
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of Gas
Distribution
System
and
Specifica-
tions,
22nd June
1923.

continued.

the preceding clause no right of action for work done under the contract or for materials or plant of which the Company may have taken possession or in any other respect shall arise until the General Manager has certified that the works have been satisfactorily completed and the cost of completion and the advances which have been made to the Contractor have been ascertained and the amount thereof certified by the General Manager in writing. If upon this being done it appears from the General Manager's certificate that such amount is less than the contract price then the Company shall pay the balance to the Contractor within seven days after the issue of such certificate and if it so appears that such amount is more than the contract price then the balance shall be a debt from the Contractor to the Company. 10

18. If any action is brought against the Contractor for anything done or omitted to be done in the execution of this contract and the General Manager certifies that in his opinion the action will if allowed to proceed, delay the completion of the works or otherwise prejudice the Company, the Company may give the Contractor written notice that if the action is not compromised or otherwise put an end to within ten days they will themselves compromise it and should the Company in pursuance of such notice compromise the action they will be entitled to deduct from the money due or to become due to the Contractor all costs and expenses incurred by them in compromising the action. 20

19. The Company will pay to the Contractor between the first and fifth and the fifteenth and twentieth of each and every month during the period of construction ninety per cent of the value of the work performed during the two weeks respectively preceding the commencement of such period as certified to in writing by the General Manager whose certificate shall be final, but no certificate shall be taken as any admission against the Company or construed as evidence of the proper performance of any part of the contract. 30

20. The Company covenants to pay the Contractor as follows:

FOR THE MAIN LINE FROM THE WELLS TO THE CITY OF
EDMONTON.

12" pipe @ forty-five cents (45c) per lineal foot.
10¾" pipe @ forty cents (40c) per lineal foot.

FOR THE CITY BELT LINES AND CITY MAINS.

12" pipe @ fifty-five cents (55c) per lineal foot.
10" O.D. or 10¾" pipe @ forty cents (40c) per lineal foot.
4½, 6⅝, 8⅝" @ twenty-five cents (25c) per lineal foot.
Service Connections..... \$12.00 each. 40

Payments shall be made to the Contractor in United States of America funds or in Canadian funds of an equal par value, par to be determined by the rate of exchange on each day of payment.

21. It is a term of this Agreement and the Contractor agrees, to purchase from the Company One Number 4A and One Number 1 Buckeye Ditching Machines and the spare parts accompanying these machines, paying therefor the purchase price paid by the Company plus freight, duty and sales tax, and the Contractor shall use the three other Number 1 Buckeye ditching machines and the spare parts accompanying them that have been purchased by the Company paying for the use thereof the difference between their cost plus freight, duty and sales tax, and the value thereof as certified by the General Manager at the conclusion of the contract, payment of said purchase price and the said rental being deducted from the final payment to the Contractor.

22. In the event of ambiguity in or doubt as to the meaning of any of the terms of the Indenture or specifications the matter shall be referred to the General Manager for directions and his directions shall be complied with by the Contractor, while the General Manager shall have the right at any time in writing to give directions as to any matter which by oversight has been omitted from the specifications, and such directions shall be treated as if originally embodied in the specifications subject to any increased allowance to which the General Manager may consider the contractor entitled by reason of additional and previously un contemplated work, if any, caused thereby.

This Agreement shall enure to the benefit of and shall be binding upon the parties hereto and each of them, their respective heirs, executors, administrators and assigns.

IN WITNESS WHEREOF the said Contractors have hereunto set their hands and seals, and the Company has caused its corporate seal to be affixed, authenticated by the signatures of its proper officers, the day and year first above written.

SIGNED, SEALED and DELIVERED in the presence of
H. R. Milner.

Williams Bros.,
S. M. Williams, Jr.

Northwestern Utilities Limited
by its agent, Ford, Bacon and Davis, Inc.,
per E. G. Hill.

Exhibits
and
Documents

No. 6.
Agreement
between
North-
western
Utilities
Limited
and
Williams
Brothers
for Con-
struction
of Gas
Distribution
System
and
Specifica-
tions,
22nd June
1923.
continued.

Exhibits
and
Documents.

No. 6.
Agreement
between
North-
western
Utilities
Limited
and
Williams
Brothers
for Con-
struction
of Gas
Distribution
System
and
Specifica-
tions,
22nd June
1923.
continued.

Specifications attached to Indenture of Contract dated the 22nd day of June A.D. 1923 and made between WILLIAMS BROTHERS and THE NORTHWESTERN UTILITIES LIMITED, for construction of a transmission pipe line from the Viking natural gas field to Edmonton, Alberta.

Delivery of Pipe, Etc.

The pipes, gates, fittings, couplings, and materials to be put into the said line shall be furnished and delivered by the Company at the following railroad points and approximately in the quantities at each point as scheduled, viz.:

10

<u>Shipping point:</u>	<u>Pipe</u>	<u>Couplings:</u>
Viking, Alberta.		
Bruce, "		
Holden, "		
Poe, "		
Ryley, "		
Shonts, "		
Tofield, "		
Deville, "		
Edmonton, "		

20

Weight of Pipe.

10" approximately 28 lb. per ft. in random lengths averaging about 19½ ft. plain ends.

12" approximately 32 lb. per ft. in random lengths averaging about 19 ft., plain ends.

Painting Pipe.

The pipe shall be painted with one coat of Ebonol or equal. Precaution shall be taken to insure that the entire surface of the pipe and couplings is thoroughly coated before the pipe is lowered into the trench.

The Ebonol or other coating material will be supplied by the Company. The labor of applying same is to be done by the Contractor at his expense.

30

Hauling Pipe, Etc.

When the pipe, gates, couplings, fittings and materials for the line are delivered at the railroad points specified, the Contractor shall unload the same from cars promptly and haul and string said pipe, gates,

fittings and couplings and material along the line of the trench following the right of way of the said Company; the Contractor is responsible for and shall relieve the Company from all demurrage, storage and siding charges and all damages done to pipe, gates, couplings, fittings, and materials after the delivery to the said railroad stations. If it shall become necessary to remove and store said pipe, gates, couplings, fittings and materials, short bends of pipe or other material before the same have been placed permanently in the trench, the same shall be done by the Contractor without extra charge to the Company.

Exhibits
and
Documents.

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No. 6.
Agreement
between
North-
western
Utilities
Limited
and
Williams
Brothers
for Con-
struction
of Gas
Distribution
System
and
Specifica-
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22nd June
1923.
continued.

10 Trench.

The trench shall be of such depth that there shall be at least twenty inches of dirt on top of the pipe, measured from the top of the pipe to the natural surface of the ground, no extra charge shall be made when it is of greater depth or a credit allowed when it is less, unless the depth should exceed four feet in which case the Contractor shall be paid the actual labor cost for the excess in the depth of the ditch over four feet, provided said ditch is dug by hand. If in crossing creeks, hills, railroads and ravines, the General Manager of the Company deems it necessary to lay the line at a special depth not exceeding four feet or to erect a

20 trestle, the Contractor is to comply with the directions of the General Manager, and if required by the General Manager shall furnish a trestle and do the digging of the trench for the distance so to be crossed, said trestle to be erected according to the plans to be furnished by the General Manager.

An additional compensation shall be paid to the Contractor (by the Company) for any such trestle or other means of securing the pipe in place otherwise than by laying it in trench to be computed at the actual cost plus 10 per cent. for overhead and profit. On railroad crossings, footage will be allowed for the protective casing at the same rate as for

30 the line.

Alkali.

Where the trench passes through runs, sloughs, or creeks where there is or is likely to be alkali or other substances likely to damage the pipe must be encased in a box of such size as to give working space of 3" around the pipe, the box to be of 2" plank and after the line is tested and inspected the space between the pipe and boxing is to be filled with cement, asphaltum or other packing to protect the pipe.

The quantity and quality of the boxing is to be specified by the Company and furnished and installed by the Contractor who will be paid

40 a reasonable additional amount to cover the excess cost of this work over the cost of plain trench.

Exhibits
and
Documents

No. 6.
Agreement
between
North-
western
Utilities
Limited
and
Williams
Brothers
for Con-
struction
of Gas
Distribution
System
and
Specifica-
tions,
22nd June
1923.
continued.

Drains.

Where the trench crosses drains the same shall be put in as good condition as such drains were before the trench was dug, and any damages sustained by tenants or land owners by reason of damaged drains shall be paid by the Contractor.

Springs.

Where the trench approaches springs the Contractor shall use every effort not to injure such springs and any damage to the same shall be paid by the Contractor.

Caving Trench.

10

In the event the trench caves before pipe is laid the Company agrees to assume half the cost of cleaning out such trench up to five (5) cents per lineal foot, provided the General Manager has instructed the Contractor to excavate such ditch in advance of the arrival of pipe. The Company shall assume no liability for the cost of crumbling trench prior to laying of pipe.

Protecting Trench.

The trench at all times during the progress of the work must be protected by the Contractor by barricades and lanterns at road crossings or other dangerous places, and all damages arising from non-protection of said trench or injury done to persons or property during the laying and completion of the line shall be at the cost of the Contractor, the Company to be relieved of any liability. 20

Laying Pipe.

The pipe shall be laid in a good workmanlike manner to the depth above described. Each joint of pipe shall be properly entered in the centre ring and driven home; the rubbers properly adjusted and bolts well screwed up. The pipe when laid shall lay down upon the bottom of the trench.

Creek Crossings.

30

Where the line shall be laid across a creek the said line shall be laid perfectly tight and where necessary pins or hooks of such size and length as may be directed by the said General Manager shall be used for anchoring the line in the creek; and where it is directed by the General Manager that screwed or welded pipe shall be used instead of the coupler joint, then in such case these lines shall be clamped and no

extra charge shall be made by reason of screwed or welded pipe being used instead of the coupler joint. Contractor is to devise ways and means to do this work entirely at his own expense; the Company is to deliver the clamps, bolts and pins complete at the nearest shipping point and the Contractor to haul the same where needed without extra charge.

Exhibits
and
Documents
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No. 6.
Agreement
between
North-
western
Utilities
Limited
and
Williams
Brothers
for Con-
struction
of Gas
Distribution
System
and
Specifica-
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22nd June
1923.
continued.

Clamps.

Where it is necessary to use clamps on fittings at creek crossings or at other places, in the judgment of the said General Manager, the same shall be furnished by the Company at the nearest shipping point
10 and shall be hauled by the Contractor to the points where they are to be used and there put on by him without extra charge.

Gates, Connections and Drips.

The said General Manager is to decide and direct at what points gates, drips and necessary connections are to be put in, and the same shall be installed by the Contractor without any extra charge; after the line has been tested boxes shall be placed by the Contractor over each valve, of such size and character as said General Manager may direct, and no charge shall be made for the lumber in said boxes, nor for extra
20 digging required to put said fittings, gates and boxes in the line; at such places where boxes are put over valves the surplus earth shall be hauled away if the land owner or tenant so requires; the Company to furnish iron frames and lids for covering said boxes where the General Manager directs that the boxes be fitted with iron frames and lids. The number of main line gates shall not exceed seven (7) and main line drips shall not exceed five (5). Syphon drips shall be installed by the Company, or by the Contractor at cost plus 15% at the option of the Company.

Dead Caps.

The Contractor shall cap the pipe at the starting end of each stant.
30 the cap to be suitable in size and shall carry with the gang laying pipe a suitable cap so that at any time that work is stopped the cap can be properly adjusted so as to prevent any dirt or material from getting into the line. This precaution must be carefully observed and at no time neglected as the line must be delivered to the Company entirely free from water, dirt or other obstruction and if by reason of neglect to use these caps while laying pipe or otherwise, there is got into the line any water, dirt or other obstruction, the line shall then and there and at points designated by the General Manager be cut and such parts taken out, examined, cleaned and replaced at the Contractor's expense. Under

Exhibits
and
Documents.

No. 6.
Agreement
between
North-
western
Utilities
Limited
and
Williams
Brothers
for Con-
struction
of Gas
Distribution
System
and
Specifica-
tions,
22nd June
1923.
continued.

no circumstances will the Company accept the plea that obstruction can be blown out with gas pressure. The line before its completion and acceptance must be absolutely clean and dry.

Road Crossings.

At all road crossings there must be at least four (4) feet of dirt cover over the pipe, measured from the top of the pipe to the natural surface of the ground at the low point of the road ditch. No extra charge shall be made by the Contractor for the extra depth of trench required at road crossings.

Bends and Angles.

No angles are to be left in couplings of more than three degrees or one foot deviation from the tangent in one full joint of pipe. Contractor is not to cut the pipe for the purpose of putting in couplings so as to change the angles of the line except by permission of the General Manager, but is to bend the pipe where a greater angle than three degrees is necessary to make the pipe fit the bottom of the ditch, but it is understood that the Contractor may at his option cut the ditch to a greater depth to avoid using bent pipe, but no ditch shall exceed eight feet in depth without the consent of the General Manager. All bends must be carefully made without buckling the pipe.

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Delay in Furnishing Materials

The Company will use every endeavor to furnish all pipe, couplings, fittings and other materials at such times as will not delay the Contractor, but should the Contractor be delayed by reason of not having said pipe fittings, couplings and other materials, no charge shall be made by the Contractor for any loss occasioned by such delay, except that should backfill freeze by reason of such delay the Company will share equally with the contractor the additional cost of backfilling.

Cleaning up.

After the line has been laid the Contractor shall haul all pipe fittings, material, scrap, etc., left at different points along the line to the nearest railway stations, all of which shall be done without extra charge.

30

Fences, Ditches and Roads.

All fences taken down for whatever purpose shall be replaced by the Contractor in as good condition as they were before the line was laid, and the Contractor shall do as little injury as possible to the lands, crops, fences, orchards, stock, drains, and springs of the land owners or

tenants. All damages caused to any person or property by reason of digging the trench and leaving the same open, laying the pipe, refilling the trench and hauling, except such as is covered by the Company's right of way, shall be settled for by the Contractor and a receipt for same turned over to the Company. The Contractor shall be responsible for all damage to bridges or culverts. Contractor will comply with all conditions and covenants that may be contained in the Company's right-of-way, contracts or agreements, so far as the same relate to the construction of the line and treatment of the work as respects the rights of the land owners and tenants, and shall be responsible for the breach thereof. If the right of entry of the Company is not complete as to any property, the Contractor will pile up the necessary pipe and couplings for such property, at points adjacent thereto and will construct the line across said property as soon as the right of entry has been obtained in which case the Company shall pay as an extra the actual cost of the extra string required.

10

Testing.

The line when completed shall be tested to 450 pounds per square inch with gas pressure for the first twenty miles, 300 for the next eighteen and 250 for the remainder and must be made perfectly tight by the Contractor under this pressure before the line shall be deemed completed. The Company is to furnish the gauge and will use its best efforts to test the line as the work proceeds. If under these tests the line shall break due to bursting of pipe or couplings or from other causes beyond the control of the Contractor the expense of repairing the line and re-testing will be borne by the Company.

20

Refilling Trench.

After the line has been lowered into the trench, the trench shall be backfilled. In backfilling the earth is to be filled in around and on top of the pipe and none left scattered along the sides of the trench. Where the trench crosses or runs along the road it shall be carefully backfilled and the earth tamped to the surface so that the crossing shall leave the road in as good condition as when entered upon. In such backfilling of the trenches or along roads the requirements of the officers in charge of said roads shall be complied with.

30

Superintending Work.

The General Manager shall have the right to appoint inspectors, who shall at all times have access to the works.

Exhibits
and
Documents.

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No. 6.
Agreement
between
North-
western
Utilities
Limited
and
Williams
Brothers
for Con-
struction
of Gas
Distribution
System
and
Specifica-
tions,
22nd June
1923.

continued.

Exhibits
and
Documents

No. 6.
Agreement
between
North-
western
Utilities
Limited
and
Williams
Brothers
for Con-
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of Gas
Distribution
System
and
Specifica-
tions,
22nd June
1923.
continued.

Defective Pipe.

The Contractor shall see that the ends of the pipe are in proper condition to receive the couplings, and if pipe when delivered on cars is dented or out of round at the ends, the contractor shall repair said pipe where possible and the Company will pay the Contractor the cost of these repairs. The Company shall be advised promptly on receipt of a defective pipe.

Seven pages of these specifications.

H. R. M.

Northwestern Utilities Ltd.

10

Williams Brothers.

(Part of Contract dated June 22nd, 1923)

H. R. M.

SPECIFICATIONS

for the

Construction of a Natural Gas Distribution System

in the City of Edmonton, Alta.

The Company has a franchise for the distribution of natural gas in the City of Edmonton and has prepared or is about to prepare plans for the construction of a distributing system in said city, to be constructed principally of plain end steel pipe of 4½", 6⅝", 10" and 12" external diameter, totalling approximately eighty miles in length. 20

Delivery of Pipe, Etc.

Said pipes, gates, fittings, couplings and materials are to be delivered to the contractor at the Company's warehouse in the City of Edmonton or on board cars at freight terminals or railway sidings within the said city, or both, as the case may be.

Weight of Pipe.

4½"	6.24 lbs. per foot approximately
6⅝"	11.39 " " " "
8⅝"	18.25 " " " "
10"	21.24 " " " "
12"	32.00 " " " "

30

The pipe will average about 19'6" in length per joint.

Painting Pipe.

The pipe shall be painted with one coat of Ebonol or equal. Precaution shall be taken to insure that the entire surface of the pipe and couplings is thoroughly coated before the pipe is lowered into the trench. The Ebonol or other coating material will be supplied by the Company. The labor of applying same is to be done by the Contractor at his expense.

Hauling Pipe, Etc.

10 The contractor shall unload all materials which he is to install from cars or shall take same from the Company's warehouse, as the case may be, and shall haul or string said pipe, fittings, couplings and materials along the routes of the pipe line in the streets and alleys, placing said pipe and materials so as to interfere as little as possible with the use of the streets or alleys, and shall be responsible for and relieve the Company from all demurrage, storage and siding charges and all damages done to pipe, gates and couplings, fittings and materials after they have been unloaded from cars or removed from the Company's warehouse. If it shall become necessary to remove and store said pipe, gates, couplings, fittings and materials before the same have been placed permanently in the trench, the same shall be done by the contractor without
20 extra charge to the Company.

Trench

The trench shall be of such depth that there shall be at least 24" of dirt on top of the pipe, measured from the top of the pipe to the correct grade of the surface of the street or alley in which the pipe is laid. If the actual surface of the street or alley is higher than the correct grade, the trench shall be cut to the necessary additional depth that will permit 24" of cover on the pipe when said street or alley is at its proper grade; but, if the surface of the street or alley is below the proper grade, the trench shall be cut to a depth that will permit at least 18" of cover on
30 top of the pipe to the actual surface, and at least 24" cover when the street or alley has been filled to the proper grade.

Two Lines in One Trench.

Where the plans require two pipe lines to run parallel in the same street or lane, they shall be laid side by side in the same trench with working clearance between. No extra charge shall be made by the Contractor on account of this requirement.

Exhibits
and
Documents
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No. 6.
Agreement
between
North-
western
Utilities
Limited
and
Williams
Brothers
for Con-
struction
of Gas
Distribution
System
and
Specifica-
tions.
22nd June
1923.
continued.

Exhibits
and
Documents.

No. 6.
Agreement
between
North-
western
Utilities
Limited
and
Williams
Brothers
for Con-
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of Gas
Distribution
System
and
Specifica-
tions,
22nd June
1923.
continued.

Protecting Trenches.

The trench at all times during the progress of the work must be protected by the Contractor by barricades and lanterns at street crossings or other dangerous places, and all damages arising from non-protection of said trench or injury done to persons or property during the laying and completion of the line shall be at the cost of the Contractor, the Company to be relieved of any liability.

Laying Pipe.

The pipe shall be laid in a good workmanlike manner to the depth above described. Each joint of pipe shall be properly entered in the centre ring and driven home; the rubbers properly adjusted and bolts well screwed up. The pipe when laid shall lay down upon the bottom of the trench. 10

Bends and Angles.

No angles are to be left in couplings of more than three degrees or one foot deviation from the tangent in one full joint of pipe. Contractor is not to cut the pipe for the purpose of putting in couplings so as to change the angles of the line except by permission of the general manager, but is to bend the pipe where a greater angle than three degrees is necessary to make the pipe fit the bottom of the ditch, but it is understood that the contractor may at his option cut the ditch to a greater depth to avoid using bent pipe, but no ditch shall exceed eight feet in depth without the consent of the general manager. All bends must be carefully made without buckling the pipe. 20

Delay in Furnishing Materials.

The company will use every endeavour to furnish all pipe couplings, fittings and other materials at such times as will not delay the contractor, but should the contractor be delayed by reason of not having said pipe fittings, couplings and other materials no charge shall be made by the contractor for any loss occasioned by such delay, except that should backfill freeze by reason of such delay the company will share equally with the contractor the additional cost of backfilling. 30

Cleaning Up.

After the line has been laid the contractor shall haul all pipe fittings, material, scrap, etc., left at different points along the line to the Company's warehouse, all of which shall be done without extra charge.

Testing.

The system shall be tested with air to fifteen pounds per square inch for the low pressure mains and one hundred pounds per square inch for the intermediate pressure mains and must be made perfectly tight by the contractor under this pressure before the work shall be deemed completed. The contractor is to furnish the air compressor and other equipment necessary for the testing, and the company is to furnish the gauge. The company will use its best efforts to test the line as the work proceeds. If under these tests the line should break due to bursting of pipe or couplings or from other causes beyond the control of the contractor, the expenses of repairing the line and re-testing will be borne by the company.

Refilling Trench.

After the pipe has been lowered into the trench the trench shall be backfilled. In backfilling the earth is to be filled in around and on top of the pipe and none left scattered along the sides of the trench. Where required by the City the trench shall be carefully backfilled and the earth tamped to the surface so as to leave the street in as good condition as it was when entered upon. Surplus earth shall be removed where required by the City. Contractor shall be paid the actual cost including a reasonable overhead allowance and liability insurance for the additional cost of tamping backfilling should this be required by the City.

Franchise Conditions.

The Contractor shall comply with the conditions laid down in Paragraph 1 of the By-Law No. 662 of the City of Edmonton which is the Company's gas franchise, except that the Contractor's responsibility for maintenance of the streets shall cease upon the acceptance of his work by the Company and that the Contractor shall not be responsible for the cost of any change or alterations to the works of the City caused or necessitated by the works of the Company.

Defective Pipe.

The Contractor shall see that the ends of the pipe are in proper condition to receive the couplings, and if pipe when delivered on cars is dented or out of round at the ends, the Contractor shall repair said pipe where possible and the Company will pay the Contractor the cost of these repairs. The Company shall be advised promptly on receipt of a defective pipe.

Exhibits
and
Documents.

No. 6.
Agreement
between
North-
western
Utilities
Limited
and
Williams
Brothers
for Con-
struction
of Gas
Distribution
System
and
Specifica-
tions,
22nd June
1923.

continued.

Exhibits
and
Documents

No. 6.
Agreement
between
North-
western
Utilities
Limited
and
Williams
Brothers
for Con-
struction
of Gas
Distribution
System
and
Specifica-
tions,
22nd June
1923.
continued.

Fittings.

The Contractor shall place all the necessary elbows, tees, crossings, plugs and valves in the lines at the points designated by the Company and shall be paid therefor at the rate of 19½ feet of pipe of the corresponding size for each fitting, except plugs which are to be put in without charge.

River Crossings.

The Saskatchewan River is to be crossed at two points as shown on the plans using the city bridges. The bridge crossings shall, at the option of the Company be of welded or screwed joints and shall be in- 10
stalled by the Contractor at no additional price over the price of the same size pipe laid in trench. The Company will furnish all pipe, fittings, and fixtures necessary to secure the pipe to the bridge, but the installation of same is to be done by the Contractor at his expense. The ravine crossed by Whyte Avenue in the southeast part of the city is to be crossed on the Whyte Avenue bridge in a manner and under the conditions above described for river crossings.

Gates.

Gates are to be installed as shown on the plans and are to be protected by brick gate boxes where shown on the plans. The Contractor 20
shall provide the gate boxes and shall fit iron frames and lids for same which will be furnished by the Company.

Deadcaps.

The Contractor shall cap the pipe at the starting end of each stant, the cap to be suitable in size and shall carry with the gang laying the pipe a suitable cap so that at any time that work is stopped the cap can be properly adjusted so as to prevent any dirt or material from getting into the line. This precaution must be carefully observed and at no time neglected, as the line must be delivered to the company entirely free 30.
from water, dirt or other obstruction, and if by reason of neglect to use these caps while laying pipe or otherwise there has got into the line any water, dirt or other obstruction the line shall then and there and at points designated by the general manager be cut and such parts taken out, examined, cleaned and replaced at the Contractor's expense. Under no circumstances will the Company accept the plea that obstruction can be blown out with gas pressure. The line before its completion and acceptance must be absolutely clean and dry.

Clearing Right-of-way.

The right-of-way is to be cleared wherever necessary at the expense 40
of the Contractor.

No. 78—Inspector's Daily Report.
(Defendant's Document)

Exhibits
and
Documents.

No. 78
Inspector's
Daily
Report
17th August,
1923

NORTHWESTERN UTILITIES LIMITED
INSPECTOR'S DAILY REPORT

Date....Aug. 17/23.

Weather.....Fine.....
Contractor.....H. Williams.....
Sub-Contractor.....J. Kokura.....
Location.....Lane South of Jasper Ave.....Plan 41.....
Right-of-Way Cleared from.....to..... Total..... 10

Men.....Teams.....

Pipe Strung.....Inch from.....to..... Total.....

“ “ “ “ “ “ “ “

Men...46...Teams...1...

Ditch opened from 105 St. to 108 St. Lane south of Jas. Total 1000 ft.

Men.....Teams.....

Pipe laid.....inch from.....to..... Total.....

“ “ “ “ “ “ “ “

Men..... Teams.....

Backfilling from.....to..... Total..... 20

Men..... Teams.....

Line-Tested from.....to..... Total.....

Drips Placed at.....

Gates “ “.....

Remarks: 5 men (50cts.) and two teams (80 cts.) cleaning up on 105th Street, 9 Hours.

Signed J. FREEMAN,
Inspector.

No. 79.
Inspectors' Daily Report.
(Defendants' Document)

Exhibits
and
Documents
—
No. 79
Inspector's
Daily
Report
18th August
1923

NORTHWESTERN UTILITIES LIMITED.
INSPECTORS' DAILY REPORT.

Aug. 18/23.

Weather, Clear.

Contractor, Williams Bros.

Sub-Contractor

10 Location, 105th St. to 108th St., Lane south of 101 Ave., Plan No. 41.

Right-of-Way Cleared from to Total

Men Teams

Pipe Strung inch from to Total

“ “ “ “ “ “ Total

Men Teams

Ditch Opened From to Total

Men Teams

Pipe Laid, 12 inches from 105th St. to East of 108th St. Total 1,100 Ft.

“ “ Lane South of to 101 Ave. Total

20 Men, 20. Teams

Backfilling from 105th St. to 107th St. Total 900 Ft.

Lane South of 101 Ave.

Men, 26. Teams, 2.

Line Tested from to Total

On 105th St. Lane South of 101 Ave. 2 Concrete Sidewalks
each 6 ft. wide, total 12 ft.

Remarks:

On 106 St. Lane South of 101 Ave. two concrete sidewalks
each six feet wide total twelve feet.

30 On 107th St. and Lane South of 100½ Ave. Plan No. 41.
Concrete street 82 ft. wide.

Signed FRED FORBES.

No. 40.

**Invoices from City of Edmonton to Defendant.
(Defendant's Documents).**

Exhibits
and
Documents

No. 40
Invoices
from City
of Edmon-
ton to
Defendant
25th
October,
1923.

Folio 1153.

Oct. 25, 1923.

Northwestern Utilities Ltd.

To THE CITY OF EDMONTON—Engineering Dept. Dr.

1923

Oct. To labour as per Payroll Ending Oct. 20/23	\$827.16	
Dept. 10%	82.71	
		<u>\$909.87</u> 10

Distribution:

Filling Trenches 110 St. 80-89 Ave.	7-92	
" " 100 St.	72-93	
" " 111 St. 84-90 Ave.	7-92	
" " 112 St. 81-83 Ave.	175-70	
Excavating and Filling 103 St.	61-11	
Sidewalk repairs and filling in 97-98 Sts. 83-90 Ave.	7-92	
Excavating and Filling in 104 St. 81, 82-83 Ave.	88-00	
" " " " 105 St.	72-32	20
" " " " 106 St.	65-83	
" " " " 107 St.	35-97	
" " " " 108 St.	32-87	
" " " " 109 St.	112-91	
Clearing Ditches and Catch Basins 102 St. 81-82 Ave.	9-68	
Repairs to sidewalk 123 St. No. of 103 Ave.	7-45	
Repairs to Culvert 108 Ave. 95½ Lane	2-64	
Grading Lane No. of Jasper 101-102 Sts.	69-15	
Grading Lane No. of 101A Ave. 100-100A St.	19-92	30
Removing Earth from 106-107 Ave. 123-126 Sts.	16-76	
Hauling Cinders to 85½ Lane E. of 99 St.	31-48	
Cleaning up on Jasper Ave.	5-08	
" " " " 109 St.	2-30	
		<u>\$909.87</u>

Folio 1304.

Nov. 24, 1923.

Exhibits
and
Documents

Northwestern Utilities Ltd.

To THE CITY OF EDMONTON—Engineering Dept. Dr.

1923

No. 40
Invoices
from City
of Edmon-
ton to
Defendant
24th and
26th
November,
1923
continued.

Nov.	To Labour as per Payroll Ending Nov. 3	\$157.60
	Dept. 10%	15.76
		<u>\$173.36</u>

	Filling Gas Trenches 98-108 Sts. 79-86 Ave.	11-88
	Grading Lane 101A Ave. 100-100A Sts.	24-95
10	“ “ 102-103 Ave. 101 St.	68-20
	“ “ N. of Jas. 114 St.	24-95
	Filling holes 106-115 Ave. 95-96 Sts.	28-16
	Installing Culvert East End, Ditch	5-28
	Constructing Crossing S. Plain Rd. 129 St.	9-94

Williams Bros. \$173.36

Folio 1318.

Nov. 26, 1923.

Northwestern Utilities Ltd.

To THE CITY OF EDMONTON—Engineering Dept. Dr.

20 1923

Nov.	To Labour as per Payroll Ending Nov. 17	\$119.58
	Dept. 10%	11.96
		<u>131.54</u>

Filling Gas Trenches for Williams Bros. 94, 95 Streets,
S. of 118 Ave, Grading Lanes.

Hauling Cinders to 106 Ave. 95-96 Sts.

No. 12.**Report by J. Wild regarding Flashing Intermediate Lines.
(Plaintiffs' Document).**

22/9/31.

FIRE TESTING THE INTERMEDIATE LINE

From No. 1 Station West to No. 2, From No. 2 to No. 3, From No. 3 to No. 4, From No. 4 to No. 5, From No. 5 to No. 6, From No. 6 to No. 7, From No. 7 to No. 8 Station.

Line going North from No. 1 Station on 89 St. to 89 Ave.

Line From 82½ Ave. going North on 91st St. 10

Line From 82½ Ave. going South on 93rd St.

Line From 82½ Ave. going South on 95A St. Gainers.

Line From 82½ Ave. going South on 107th St. to No. 14.

Line From No. 7 to No. 9 on 106 Ave.

Line From 106 Ave. South on 100 St. to C.N.R.

Line From 123½ St. West on 105 Ave. to No. 17, in Glenora.

Cromdale Line From 82 St. West on Lane North of Jasper Ave and North to Biscuit Factory Line.

Line From No. 8 Station East on Norwood Boulevard and East to No. 12 and 13 Stations. 20

Line South Highlands Line to No. 11 Station.

Line From Biscuit Factory Line North in Lane to No. 16 Station and West and North to Catholic Church on 85 St.

Line going East 82½ St. on 117 Ave. Car Barns.

Line going North on 82½ Lane From Biscuit Factory Line Fort Trail.

Line From 99 St. East Knob Hill and South on 95 St. to 93 Ave.

Line From 99 St. West at Connors Rd. To Lane West of 99 St.

Line North of Low Level Bridge to Ross Flats and 96 Ave.

Line From 104 Ave. North on 99 St. to 106 Ave. 30

Swimming Pool Line Borden Park.

No Leaks were found.

No Line flashed under Paving.

J. WILD.

No. 11.
Report by J. Wild regarding Flashing Intermediate Lines.
(Plaintiffs' Document).

6/2/32

Exhibits
and
Documents.

No. 11
Report by
J. Wild
regarding
Flashing
Inter-
mediate
Lines,
6th Febru-
ary, 1932

FLASHING INTERMEDIATE LINES

- Line going north from No. 1 to 89th Ave.
- Line from 82½ Ave. to Rutherford School.
- Line from 82½ Ave. South on 93rd St. to 81st Ave.
- Line from 82½ Ave. South to Gainers Plant.
- 10 Line from 83½ Ave. South on 107th St. to No. 14.
- Knob Hill line from 99 St. to 95 St. and 94th Ave.
- Ross Flats line from Low Level Bridge to 96th Ave.
- Line from 99th St. and Connors Rd. west to Regulator.
- Line from No. 1 Station to No. 2, No. 2 to No. 3, No. 3 to No. 4, No. 4 to No. 5, No. 5 to No. 6, No. 6 to No. 7, No. 7 to No. 8.
- Line from 105 Ave. and 123½ St. west to No. 17.
- Line on 106th Ave. from No. 9 east to lane east of 99th St.
- Line from No. 8, Biscuit Factory line and going north in lane east of Biscuit Factory to Fort Trail.
- 20 Highlands line from Biscuit Factory east to 64½ St. and 113 Ave.
- Line off Highlands line to east end Swimming Pool.
- Line off Highlands line to No. 11 Station.
- Cromdale line to No. 10 off 111th Ave.
- Line from 113th Ave. and 83½ St. north to No. 16.
- Line from No. 16 to Oblate Fathers' Home.
- Line from 82½ St. east to car barns.
- Line off Car Barns line south to school.

These lines were fire-tested and found all right.
 No flashing done where lines are paved over.

No. 91.

Gas Application and Contract.
(Defendant's Document).

GAS APPLICATION AND CONTRACT

Edmonton, Alberta, Jan. 3, 1924.

Deposit No. Amount \$.....

Corona Hotel Co., Ltd., 106-Jasper of the City of Edmonton, herein referred to as the Consumer, to Northwestern Utilities, Limited herein referred to as the Company.

The consumer requests the Company to supply natural gas to be used for lighting, heating, and cooking purposes by the consumer at the above address, for which the consumer agrees to pay the Company at the following rates, for gas consumed in any one month:

- First 60 M. cu. ft. @ 46½c per M. cu. ft.
- Next 20 M cu. ft. @ 40c per M. cu. ft.
- Next 20 M cu. ft. @ 35c per M. cu. ft.

All amounts consumed in excess of 1000 cu. ft. @ 30c per M. cu. ft. (An additional charge of 1½c per 1000 cu. ft. will be made on all accounts unpaid within twenty days of date thereof).

Such gas is to be supplied by the Company, subject to the terms and conditions printed on the back hereof, which the consumer agrees and subscribes by signing this form.

The consumer further requests the Company to install a properly government tested meter on said premises, for the purpose of measuring and registering the gas used by the consumer.

The consumer will forthwith on demand deposit with the Company the sum of Dollars, to be held by the Company intact, until the consumer discontinues the use of gas, and this contract is terminated, as security against any account or accounts of the Company against the consumer. In the event of the consumer discontinuing the use of gas and this contract is terminated, the said sum with interest at 5 per cent. per annum is to be refunded the consumer after the Company has de-

Exhibits
and
Documents

No. 91

Gas
Application
and
Contract
3rd January,
1924

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20

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ducted any accounts outstanding against the Consumer. The above mentioned interest is to be paid only when the deposit has been in the Company's hands for six months or more.

Exhibits and Documents

No. 91 Gas Application and Contract 3rd January 1924 continued.

Used Gas last Corona Hotel Co., Ltd.
Former Tenant Signature of Consumer.
New Work Old Work Per A. Dyer.
Meter Set Meter Change Turn on Business Address.
Appliances
Fitter Approved and Accepted

10

NORTHWESTERN UTILITIES, LTD.

Business Manager. (Over)

TERMS AND CONDITIONS OF CONTRACT

1. The property line shall be the place of delivery of all gas under this contract, and all expense, risk and liability in utilizing and using the gas after it is delivered at the property line shall be assumed and borne exclusively by the consumer.

20 2. The gas hereunder shall be supplied through a meter to be furnished and set up by the Company free of charge at a point on the said premises to be selected by the Company, sufficient space for such meter to be furnished free by the consumer. The quantity of gas delivered under this contract shall be ascertained by the measurement of such meter, and the measurement recorded thereby shall be conclusive upon both the Company and the consumer, excepting when such meter is found defective or ceases to register, in which case until it is repaired or replaced, the quantity of gas delivered shall be ascertained by the average of another similar meter, or by the amount delivered for the same service during a previous corresponding period. The meter is the property of 30 the Company.

3. The consumer shall not at any time tamper, meddle or interfere with the pipes, the said meter or any of the property of the Company on the said premises, nor permit anyone else to do so.

4. The consumer shall use due care to prevent any waste of gas, and in case of failure, deficiency or leakage of gas, shall immediately notify the Company by messenger or telephone, and, in case of a leak shall immediately extinguish all fire and throw open all doors and windows, so

Exhibits
and
Documents.

No. 91
Gas
Application
and
Contract
3rd January,
1924
continued.

that the gas may escape into the open air, and IN NO EVENT MUST THE CONSUMER ATTEMPT TO LOCATE THE LEAK BY THE USE OF A BURNING FLAME.

5. The Company, its officers, agents and employees or accredited representatives, shall at all reasonable hours have free access to the premises of the consumer for the purpose of reading meters, stopping leaks, examining pipes, connections and fittings, and the use made of the gas by the consumer.

6. The gas supplied hereunder is for the use of the consumer alone, who agrees not to pipe same off the premises or furnish the same to another consumer or person whomsoever. 10

7. The Company will use its best efforts to furnish a continuous and uninterrupted supply of gas but shall not be liable for any damage for failure to deliver gas from any cause whatsoever.

8. The consumer shall pay all bills or accounts within twenty days from the date thereof.

9. The meter shall be read once a month, and accounts passed upon the reading thereof. If the consumer intends to remove from the premises and to discontinue the use of gas or in any way terminate the liability hereunder, the consumer shall give the Company written notice of such intention, and if the consumer removes from the premises without giving such notice, the consumer shall be liable to the Company for all gas registered through the meter and for any loss or damage that may be sustained by the Company until such notice is given. 20

10. The Company may immediately shut off its gas for repairs or for shortage or failure of gas.

11. The Company may immediately shut off its gas for any of the following reasons:

- (a) For fraudulent misrepresentation in relation to the use of gas or the amount consumed. 30
- (b) The removal of the applicant from the premises.
- (c) Termination in any manner of this contract.
- (d) Discontinuance of the use of gas on the premises.
- (e) Non-payment of any bills when due, or failure to pay the deposit forthwith on demand.
- (f) Violation by the applicant of any part of the application or of these terms and conditions; and upon the gas being so shut off any claims for gas previously delivered shall thereupon immediately become due and payable.

12. Whenever the Company shall turn off the gas for any default of the consumer, the consumer shall pay the Company the sum of \$1.00 if upon the remedying of such default the gas is again turned on.

Exhibits
and
Documents
—

13. Whenever the Company shall discontinue the delivery of gas hereunder, the Company shall have the right at any reasonable time or times to enter the said premises and remove therefrom its said meter and all its property thereon.

No. 91
Gas
Application
and
Contract
3rd January,
1924

14. No agent, representative or employee of the Company has authority to make any promise, agreement, or representation not incorporated herein, and any such promise, agreement or representation not so incorporated shall not bind the Company, the agent, representative or employee making the same, being for such purposes the agent of the consumer.

continued.

No. 9.

Article entitled "The Odorization of Natural Gas" taken from the "Gas Age Record."

(Plaintiffs' Document).

No. 9
Article
Entitled
"The Odor-
ization of
Natural
Gas" taken
from the
"Gas Age
Record"
6th Septem-
ber, 1930

PART OF REPORT OF ODORIZATION COMMITTEE
OF THE PACIFIC COAST GAS ASSOCIATIONS.

By Lee Holtz.

Southern California Gas Company

20 In February, 1927, straight natural gas was first introduced into Los Angeles and vicinity. This gas is entirely devoid of the familiar gas smell so long associated with mixed and artificial gas. The absence of an unpleasant odor would ordinarily be hailed as a further achievement in civic welfare, but in this instance the odor served a utilitarian purpose in acting as a warning agent against gas escaping from small leaks in meters, house piping, and appliances.

30 The gas utilities operating in the Los Angeles Basin united in investigating the feasibility of odorizing the natural gas so as to enable easy detection of small leaks. Effective odorization required the injection of a stench that would simulate the well known gas smell and be easily identified as such. Research work has been conducted along this line since the latter part of the year, 1928.

The decision to odorize the gas created a number of problems that made necessary both laboratory experiments and trial field installations

Exhibits
and
Documents
—

No. 9
Article
Entitled
"The Odor-
ization of
Natural
Gas" taken
from the
"Gas Age
Record"
6th Septem-
ber, 1930
continued.

under practical operating conditions. The major problems consisted of either obtaining or developing a suitable stench and then equipment capable of automatically injecting it into high pressure mains.

Naturally before proceeding with our experiments every effort was made to obtain a complete record of previous investigations conducted with stench and odorants. There was an astounding lack of information on this subject. Records show that perhaps the earliest attempts at odorization were made in about 1918 by certain German Gas Utilities. City Ordinances required the Utilities to odorize their blue water gas as a means of detecting the CO which occurs in artificial gas. 10

In this country in 1920 the United States Bureau of Mines published Technical Paper No. 267 dealing with "Stenches for Detecting Leakage of Blue Water Gas and Natural Gas." This paper presented several tables showing the physical and chemical properties of some twenty-four chemicals that might possibly service as stenches. Many of these were impractical for one or more reasons and nearly all of them were too expensive to be satisfactory for use on a large scale. These experiments, while of little value in themselves demonstrated the necessity for obtaining the desired stench from some source other than chemicals.

During 1929 the Union Gas and Electric Company introduced ethyl 20 mercaptan into the mains of the city of Middletown, Ohio. This test covered a period of about ten days and disclosed 720 leaks of various sizes and types.

The United States Bureau of Mines is now preparing a report covering the use of warning agents in manufactured gas to detect CO. This paper is based on the results of tests conducted in the east and middle west and is expected to be a complete treatise on odorization.

Selecting the Odorant:

Before selecting the odorant it is necessary to outline the general characteristics that a desirable odorant should possess. It should give off 30 an odor resembling the artificial gas smell so that customers will be aware of the source of the odor. Ease of use and availability of supply are also highly important.

Following is a brief summary of the necessary qualities:

- (1) Harmless and neither toxic or nauseating.
- (2) A penetrating odor similar to the artificial gas smell.
- (3) Non-corrosive.
- (4) Insoluble in water.
- (5) Odor must be retained by gas and not absorbed by mains or meters.

- (6) Burn completely without harmful or odorous products of combustion.
- (7) Must not set up chemical reactions.
- (8) Must be cheap and readily available.

With these qualities in mind the Research Departments began their search for a satisfactory odorant.

An alcohol denaturant submitted by the Standard Oil Company was used as the warning agent in the first local experiments. This alcohol denaturant was introduced into the distribution mains in the City of Corona, Cal. The stench was injected over a period of 23 days, using in that time 22½ gal. of the warning agent to odorize a total of 6,566,000 cu. feet of gas. Although a number of leaks were found, the odorant did not appear to be powerful enough to provide a definite odor. The alcohol denaturant which was used had a gravity of approximately 53 deg. Be., an initial boiling point of 120 deg. Fahr. and a maximum of 460 deg. Fahr.

After the experiment at Corona, a similar test was made at Highlands, Cal., with about the same results.

A laboratory test was also made using the alcohol denaturant. In this test saturated gas was allowed to enter a room of 2400 cu. feet capacity. After a concentration of half of one per cent. had been attained, several persons entered the room and detected only a faint odor. A concentration of one per cent. was then introduced and the odor became very noticeable and potent enough to serve as a warning agent in case of a leak.

In the next laboratory test a product of the Standard Oil Company, known as "Gas Odorizer," was introduced into the same room at the rate of two and one-half gals. per million cu. ft. of gas, and it was found that a concentration of half of one per cent. gave a very noticeable odor. This warning agent was found to be four times as strong and the concentration only one-half that of alcohol denaturant.

A third test was made using ethyl mercaptan and it was found that by using two and one-half gal. per million cu. ft. a very noticeable odor was detected in a one-eighth per cent. concentration of saturated gas.

From these tests the "Gas Odorizer" appeared to offer the best stench at the least cost and enough of this odorant was obtained to make a series of tests in small districts and communities. These tests were uniformly successful and led to the installation of an odorizing station at the Hollywood Holder of the Los Angeles Gas and Electric Corporation, where it was planned to odorize the large volumes of gas served in Beverley Hills, the western section of Los Angeles and portions of Hollywood.

For the first few months about 3.5 to five gal. of odorant per million

Exhibits
and
Documents

No. 9

Article
Entitled
"The Odor-
ization of
Natural
Gas" taken
from the
"Gas Age
Record"
6th Septem-
ber, 1930
continued.

Exhibits
and
Documents.

No. 9
Article
Entitled
"The Odor-
ization of
Natural
Gas" taken
from the
"Gas Age
Record"
6th Septem-
ber, 1930
continued.

cu. ft. of gas were injected at this station. This quantity of odorant was found to create an odor strong enough to enable easy detection of leaks. With this concentration one per cent. of gas in an enclosed room was easily noticeable. The ability to detect one per cent. of gas in an enclosed area was considered important in that it provided a safety factor before a combustible mixture was formed. As about four per cent. of gas must be present in the air in order to support combustion, this gave a protection factor of approximately four.

Although this odorant was entirely successful from the point of its ability to impart odor to the gas, it was found that when introduced into high pressure mains considerable condensation occurred. The Standard Oil Company's representatives were advised of this defect and, after further experimenting, were able to perfect an odor that they claimed would completely vaporize when injected at the rate of 3.5 gal. per million cu. ft. into gas at a temperature of 55 deg. Fahr. and at a gauge pressure of 250 lbs. 10

This odorant is known as "Cal-Odorant Oil No. 3" and has the following physical and chemical properties:

Gravity	40.0° A.P.I. at 60°F.	
Specific gravity	0.8251.	20
Weight	6.870 lb. per gallon.	
Flash	Below 75F. Fire—75F.	
Total Sulphur	4.5% (bomb test).	
Acidity	None (by method 510.2, U. S. Government Master Specification).	
Distillation	(By Method No. 100.13 U. S. Government Master Specifications).	

First drop at 130F. initial.

10% at 209	60% at 328 F.	
20% at 256	70% at 342.	30
30% at 279	80% at 361.	
40% at 296	90% at 384	
50% at 306	99% at 439 maximum.	

Molecular Weight 125.

Vapor Pressure (100% vaporized).

1.0 mm. mercury	at 55 F.	
1.5 " "	at 65	
2.0 " "	at 75	
2.5 " "	at 85	
4.0 " "	at 95	40

The gallons of Cal-Odorant No. 3 required to saturate 1,000,000 cu. ft. of gas at various gauge pressures are shown in the following table:

Gauge Pressure, lb. per sq. in.	Gallons of Odorant required to Saturate 1,000,000 cu. ft. of Gas (Temp. 55 F.)
400	2.24
300	2.94
200	4.32
100	8.10
50	12.42

10

Exhibits
and
Documents

No. 9
Article
Entitled
"The Odor-
ization of
Natural
Gas" taken
from the
"Gas Age
Record"
6th Septem-
ber, 1930
continued.

Results of Odorization:

On July 30th, 1929, odorized gas was delivered to certain sections of Hollywood, Beverley Hills, the Los Angeles Wiltshire District, and the Santa Monica Bay region. The stench injected consisted of "Cal-Odorant Oil No. 1" which is less volatile than the No. 3 oil now used.

The immediate effect of the introduction of the odorant was a tremendous increase in the number of customer leak complaints. The number of complaints reached its peak on about the third day after the odorant was injected and then declined slightly during the next few days 20 period. The number of complaints appeared to vary in a more or less direct ratio to the quantity of stench used. This comparison is shown in Figs. 1 and 2.

For the last two days of July, 1929, an average of 7.7 gal. of odorant was injected per one million cu. ft. of gas.

In August this was reduced to an average of 4.4 gal. per 1,000,000 cu. ft. with an appreciable decrease in leak complaints. The average quantity injected varied from 5.9 to 3.5 gal. up to the 1st of January, 1930. During this period considerable condensation occurred in the drips, as shown in Fig. 3, and it became apparent that the odorant then in use 30 would not completely vaporize in high pressure gas. In order to obtain sufficient concentration to produce a distinct odor at the consumers' premises it was necessary to over saturate the gas.

This difficulty was remedied by the new Cal-Odorant Oil No. 3 developed by the Standard Oil Company. As this new odorant was more volatile it was found possible to reduce the quantity used to about 3 gal. per 1,000,000 cu. ft. of gas and still obtain the same intensity of odor as before. This, too, resulted in less condensation, but as the new odorant was added to the same tank containing the old odorant a slight drippage still occurred. The quantity of odorant injected and the corresponding

Exhibits
and
Documents

No. 9

Article
Entitled
"The Odor-
ization of
Natural
Gas" taken
from the
"Gas Age
Record"
6th Septem-
ber, 1930
continued.

leak complaints are shown in Figs. 1 and 2, which illustrate the results obtained by the Southern California Gas Company and the Los Angeles Gas and Electric Corporation in two typical districts. The average quantity of odorant per 1,000,000 cu. ft. for each week is plotted with the total leak complaints for the same period. Using a week as the unit, instead of a day, tends to eliminate extreme depressions or peaks and more accurately reflects the trend; in our local experience to date the odorant has been injected into mains carrying gas at a gauge pressure of about 100 lb. However, in tests at Ventura made by the Southern Counties Gas Company and using a specially constructed tower, the stench had been introduced into gas at as high as 400 lb. gauge pressure. Little or no drippage occurred with this method. 10

Nearly all of the leaks reported were found to be on the outlet side of the meter in either the meter connections, the house piping or in the appliances. The intensity of the odor disclosed many relatively unimportant leaks in which the leakages was less than $\frac{1}{2}$ cu. ft. per hr. Gas escaping from leaks of this type would completely dissipate in the air without forming a combustible mixture. On the other hand, many large leaks were found located under houses and in other inaccessible places. With odorless gas, leaks of this type are difficult to locate except by systematic investigation. 20

While reasonably effective in detecting small leaks in appliances and piping above ground the stench was not entirely satisfactory for locating leaks in mains and services. Odorized gas when escaping into the outside air, unless present in large quantities, is carried away by the air currents and does not have a powerful enough odor at the concentration now used to permit the detection of small leaks. If the main is underground the difficulty in detecting the leak is further increased, as the odorant must first permeate the surrounding soil.

Possibly by increasing the intensity of the odor in certain isolated mains and then patrolling the pipe line, a stench could be used to some advantage in leak work. This has been tried in one instance and aided in discovering the leaks. 30

There also exists another possible use by injecting the stench into new pipe lines when making the initial pressure tests. Ordinarily this test is made before the ditch is backfilled and leaks of any size could be readily detected.

As most of the leaks have been found on the outlet side of the meter probably very little saving has been accomplished in unaccounted-for gas. Unquestionably, the chief value of the odorant lies in the protection against leakage afforded to the consumer. An intangible saving of this nature is extremely difficult to evaluate in dollars and cents and despite numerous 40

attempts, no reliable comparisons of the cost of odorizing with the savings obtained have been developed.

The attention of those engaged in the direction of the odorization program is now concentrated on one of the economic aspects of the problem. The stench, as now used, reveals many very small leaks that are inconsequential, but are nevertheless expensive to investigate. It is hoped, by careful regulation of the quantity of stench injected, to obtain just the proper intensity of odor to avoid causing discomfort from pinhole leaks of one-fifth cu. ft. per hr. or less. This would appreciably decrease the
 10 expense of odorization.

Odorization equipment:

Economical odorization requires an automatic injecting device that will maintain the proportion of odorant desired per 1,000,000 cu. ft. with a constantly fluctuating flow of gas.

Several devices of this general type have been developed and two in particular, one designed by the Los Angeles Gas and Electric Corporation and one designed by the Pacific Gas and Electric Corporation, appear to operate very satisfactorily. In both of these devices the flow of the oil is regulated by the difference in the differential pressure existing be-
 20 tween the upstream side and the downstream side in an orifice meter installation.

Of the two devices, the one designed by the Los Angeles Gas and Electric Corporation has probably been subjected to the more severe tests and has been adopted for practically all installations in the southern part of the State. In this device the odorant passes through a small orifice which is connected in parallel with an orifice in the gas line, thus maintaining the same differential pressure on both the gas and the odorant. Fig. 5 shows the arrangement of a typical odorizing set-up of the type used in larger installations. With a constant static pressure the flow of
 30 either gas or liquid through an orifice is determined by the square root of the differential pressure. After the desired relationship between the two orifices is definitely established, the proper ratio of oil flow is automatically maintained within reasonable limits.

The odorization set-up consists primarily of the storage tank, daily supply tank, and odorization assembly. In the smaller stations only one tank is used. For the larger set-ups the storage tank has a capacity of from 1000 to 3000 gal. and the odorant is transferred to the daily supply tank either by gas pressure or a small hand pump. The stench then feeds
 40 by gravity into a float pot which is maintained at a constant level by an automatic shut-off controlled by a float. A gauge glass makes it possible to check the level of the liquid in the float pot.

Exhibits
and
Documents.

No. 9
Article
Entitled
"The Odor-
ization of
Natural
Gas" taken
from the
"Gas Age
Record"
6th Septem-
ber, 1930
continued.

Exhibits
and
Documents.

No. 9
Article
Entitled
"The Odor-
ization of
Natural
Gas" taken
from the
"Gas Age
Record"
6th Septem-
ber, 1930
continued.

A small gauge line is connected to the upstream side of the meter set-up and to the top of the float tank, by this means maintaining the same pressure in the float chamber as in the upstream side of the gas line. A gauge line from the side of the float pot carries the odorant through a strainer and an orifice to a sight feed oiler which allows the stench to drip by gravity into the downstream side of the orifice meter set-up. The gas stream impinging against the interior of the pipe completes the vaporization of the stench.

As before stated, the size of the orifice in the odorant line has a definite relation to the size of the orifice in the meter installation. This relationship is established by means of a short length of pipe of known capacity termed the calibration tube. The quantity of gas passed can be obtained from the orifice meter chart and the quantity of odorant injected by the calibration chamber. From a comparison of the two quantities, and knowing the square root of the differential pressure, it is possible to approximately determine the size of the orifice in the odorant line required to deliver the desired number of gallons of odorant per 1,000,000 cu. ft. of gas. Repeated test runs will verify the size of orifice selected. 10

To obtain complete saturation at high line pressure of from 300 lb. to 400 lb. it has proved desirable to mount the odorization assembly on top of a short tower filled with small round rocks about 2 to 3 in. in diameter. The odorant dripping on the rocks is broken up into a fine spray and forms a film over the surface of the rocks, thus exposing a large area for absorption by the gas passing through the tower. 20

This device was designed by the Southern Counties Gas Company and has been used very successfully in odorizing gas at Ventura for delivery to Santa Barbara.

For a small installation the tower can consist of a 12 ft. length of 12 in. pipe. Passing the gas through the tower results in a slight pressure loss, but at its maximum does not exceed 5 lb. gauge pressure. 30

While the odorization equipment developed by the Los Angeles Gas and Electric Corporation has been very satisfactory in handling large volume of gas it was believed that perhaps a cheaper and less complicated device could be designed for smaller installations. With this in mind, a number of tests were made with a wick device that depended on an evaporation from the surface of the wick as the medium for introducing the odorant into the gas. Although it was found possible to saturate the gas by this method, it proved very difficult to accurately regulate the quantity of odorant injected. Further laboratory experiments are being carried on with this device, but to date it has not operated with a sufficient degree of accuracy to warrant a trial installation. 40

Tests have also been made with a carburetor device that, from preliminary results, appears to have practical possibilities. A complete report of the tests on this equipment will be made available soon.

Exhibits
and
Documents
—

Future odorization program:

No. 9

Article
Entitled
"The Odor-
ization of
Natural
Gas" taken
from the
"Gas Age
Record"
6th Septem-
ber, 1930
continued.

The successful odorization of gas at Ventura for delivery to Santa Barbara, a distance of some 30 miles, has demonstrated the possibilities of odorizing gas in the production fields or at strategic points along the transmission lines for eventual consumption at distant distribution centres. By this means the number of odorization stations can be kept at a minimum with a corresponding economy in operation. Some small stations will be necessary, however, in certain sections in order to avoid odorizing gas served to large industrial districts. As odorized gas is not required for industrial purposes arrangements have been made to serve unodorized gas in certain sections with an appreciable saving in costs.

From actual installation costs it now appears to be possible to erect an odorization station with a 1,000 gal. supply tank for about \$750.00. On the basis of 3 gal. of Cal-odorant Oil No. 3 per 1,000,000 cu. ft. the cost of odorization would be about \$0.000825 per thousand or less than one-tenth cent.

While the cost of the odorizing station and the stench is the first cost, there also exists the cost of investigating the increased number of complaints. It is possible to absorb a great deal of this increased work with the existing operating force, although for different companies this cost will vary considerably. Some companies use only one man on complaint order work, while leak crews in other companies consist of as many as three men.

In conclusion it is the opinion of this committee:

- (1) That the stench is of little or no assistance in locating leaks in transmission and distribution mains.
- (2) That it is reasonably effective in locating leaks on the consumer's premises.
- (3) That odorization equipment and odorant have now been developed to a point where they can be regarded as past the elementary stage, but still subject to considerable improvement.
- (4) That Cal-Odorant No. 3 will carry through the mains for 30 to 40 miles.

No. 13.

Memoranda Regarding Odorization of Natural Gas.
(Plaintiffs' Documents)

Exhibits
and
Documents

No. 13
Memoranda
Regarding
Odorization
of Natural
Gas
7th
October,
1931

Edmonton, Oct. 7th 31

Mr. C. J. Yorath,
President.

I attach hereto a memo which I have received from Mr. Spencer to-day on odorization. In view of the excessive cost, I am of the opinion that we should only include in the 1932 budget his third estimate which covers odorization for 16 days for testing purposes only. Please let me 10 know if you agree.

The question of continuous odorization is one which, I think, should be taken up at the time of the next revision of our rates. The annual expense can then be taken into consideration in fixing the rates if it is decided that the policy should be adopted.

Yours very truly,

JG:CC
Encl.

Manager.

Edmonton, October 7th, 1931.

ORGANIZATION OF NATURAL GAS FOR EDMONTON.

20

1st Estimate

Continuous Odorization.

Estimated Gas Consumption for year 1932=2,700 million cubic feet using 5 lbs. of Odorizing agent per million cubic feet.

2,700 x 5—13,500 lbs. @ \$1.942 per lb.	\$26,217.00
11,000 letters to customers at 5c each	550.00
Odorizing equipment	150.00
3 men continuously, at \$1,500.00 per year	4,500.00

Total Cost \$31,417.00

2nd Estimate

Odorization for last 10 days of June at 5 lbs. per million cubic feet. 30
 This is before holidays commence to detect house leaks. First 6 days of July at rate of 40 lbs. per million cubic feet. This is during very light load

to detect leaks in mains and services, balance of year at 1¼ lbs. per million cubic feet.

		Exhibits and Documents
10 days at 3.7 million cubic feet gas per day— $37 \times 8 \times 1.942 =$	\$ 360.00	—
6 days at 3.5 million cubic feet gas per day— $21 \times 40 \times 1.942 =$	1,632.00	No. 13
Balance of year 2,642 million cubic feet at 1¼ lbs. per day	6,414.00	Memoranda
Odorizing equipment	150.00	Regarding
Three men at \$1,500.00	4,500.00	Odorization
Letters to customers	550.00	of Natural
		Gas
		7th and 8th
		October,
		1931
	Total Cost	<i>continued.</i>
	<u>\$13,606.00</u>	

3rd Estimate

Heavy odorization for 16 days only as in Estimate No. 2.

10 days at 5 lbs. per million cubic feet	\$ 360.00
6 days at 40 lbs. per million cubic feet	1,632.00
Odorizing equipment	150.00
Operators (3 for 16 days)=48 days at \$4.00	192.00
Letters to Customers	550.00
	Total Cost
	<u>\$ 2,884.00</u>

20 The cost of ethyl mercaptan the agent figured on is as follows:

50 lbs. at \$1.28	\$64.00	f.o.b St. Louis Mo.
40% Duty	25.60	
\$3.00 per C Freight	1.50	
Drums	6.00	
	Cost of 50 lbs. f.o.b. Edmonton	
	<u>\$97.10</u>	= \$1.942 per lb.

These figures do not take care of extra help required for the initial period of incorporation to take care of excess number of leaks that may be found.

30

Calgary, Alberta,
October 8th, 1931.

Memo: To Mr. Julian Garrett.

In reply to your memorandum on Odorization of Gas, it will only be necessary to include in next year's Budget, Estimate No. 3, namely, Heavy odorization for 16 days only.

Yours very truly,

C. J. YORATH,
President.

CJY/LMB

Edmonton, Oct. 13th, 1931.

Exhibits
and
Documents.—
No. 13
Memoranda
Regarding
Odorization
of Natural
Gas
13th
October,
1931
*continued.*Mr. C. H. Spencer,
General Superintendent.

Budget—1932.

In respect to your memo re Odorization of Gas, it will only be necessary to include in the budget estimate No. 3, viz.: Heavy Odorization for 16 days only.

Yours very truly,

JG/CC

Manager.

No. 8
Letter
from Julian
Garrett,
Manager
of the
Defendant,
Addressed
to "Our
Customers"
9th Decem-
ber, 1932

No. 8.
Letter from Julian Garrett, Manager of the Defendant, Addressed to 10
"Our Customers."
(Plaintiffs' Document)

NORTHWESTERN UTILITIES LIMITED
NATURAL GAS SERVICE
EDMONTON, ALBERTA

December 9th, 1932.

PERSONAL LETTER

TO OUR CUSTOMERS:

This letter, and the one which will follow, are written for the purpose of giving our customers a very brief review of the work which has been carried on in their interest during the present year. 20

Early in the year we commenced experimenting to determine the feasibility of odorizing the gas. As you know, unlike the gas from Turner Valley which even after scrubbing contains a large quantity of sulphur, our gas brought in from the Viking Field is what is commonly called "sweet." Odorization of gas such as ours has barely passed the experimental stage anywhere, and a good many problems such as the character of the odorant to be used and its capacity to remain in suspension were presented. We think they have all been solved with the result that any

escape of unconsumed gas will be readily detected. The result is that we are now delivering to you not natural gas only, but natural gas containing an artificial but perfectly harmless odorant.

Various additions and betterments have been made to our plant, including the construction of two more miles of the duplicate transmission line which now reaches from the Viking field to a point two miles West of Ryley. In the Viking field an additional well was successfully drilled, and in the Kinsella field, which is 12 miles farther East, two discovery wells were brought into production with great success. One of them
 10 has an open flow of 7,500,000 cubic feet, and the other 19,000,000 cubic feet, which is by far the largest of our 25 wells. We are now confident of an adequate supply of gas for many years to come. All of this has involved the expenditure of very substantial amounts of money and has given employment to a large number of people in Northern Alberta.

We supply you with the most perfect known fuel. Should any problem connected with its use confront you, our organization is always at your command.

Yours very truly,

JULIAN GARRETT,

Manager.

20 JG/CC

No. 80.

Report of Barner Re Construction of Weir Chamber.

(Plaintiffs' Document)

Referring to the connection that was put in on the first lane south of Jasper on 107 St. This connection was cut out, a brick wall was built, and concrete was run in between the brick wall and the clay wall. No Gas mains were seen and no caves was made. The roof was put on with six or eight inches of concrete right up against the clay.

GEORGE BARNER.

30 Tegler Block, Room 2.
 10272-97 St. or
 c/o Black Diamond Mine.

Exhibits
 and
 Documents
 —

No. 8
 Letter
 from Juliar
 Garrett,
 Manager
 of the
 Defendant,
 Addressed
 to "Our
 Customers"
 9th Decem-
 ber, 1932
continued.

No. 80
 Report of
 Barner re
 Construc-
 tion of
 Weir
 Chamber
 Undated

No. 93.

Two Letters from City Engineer to Plaintiffs' Solicitors.
(Plaintiffs' Document)

Exhibits
and
Documents

No. 93
Two Letters
from City
Engineer to
Plaintiffs'
Solicitors
3rd and 8th
February,
1934

CITY ENGINEER'S DEPARTMENT
EDMONTON, ALBERTA
CANADA

Edmonton,
February 3rd, 1934.

Woods, Field, Craig & Hyndman,
S. B. Woods, Esq.,
McLeod Building, City.

10

Re: Corona Hotel.

Dear Sir:

The following information is sent in connection with the above matter, indicating the times at which the Sewer Work was done at 107th Street and the lane south of Jasper.

Manhole B, commenced about February 15/1931.

Manhole B, finished about March 31/1931.

The actual construction at the intersection of 107th Street and lane south of Jasper was finished as indicated about March 31st/1931, but on account of the non completion of the outlet at 102nd Avenue and 107th Street, the actual work was not brought into commission until May 7th/1931. 20

Yours truly,
A. W. HADDOW,
City Engineer.

AWH/g.b.

CITY ENGINEER'S DEPARTMENT
EDMONTON, ALBERTA
CANADA

Edmonton, 30
February 8th, 1934.

Woods, Field, Craig & Hyndman,
S. B. Woods, Esq.,
McLeod Building, City.

Dear Sir:

Re: Corona Hotel Fire.

In the above connection I have gone further into the dates of pro-

gress as indicated in my letter of February 3rd. I enclose herewith blue-print copy of our Daily Progress chart.

107th Street from 102nd Avenue to the lane south of Jasper is underlined in yellow, and the lengths of blocks actually laid on this stretch are as shown.

You will note that block laying progressed between February 5th and March 26th with two short lengths laid on April 13th and 14th at 102nd Avenue.

I have looked up our delivery slips for material and find that Man-
10 hole blocks for Manhole B were delivered on April 6th so that Manhole B was finished later than March 31st—indicated in my February 3rd letter, and this date would be probably April 10th or 12th.

I might advise you that our Storm Sewer work was carried on continuously in three shifts. Generally speaking, the morning shift 8 a.m. to 4 p.m., was utilized for block laying, and the afternoon shift—4 p.m. to midnight, and the night shift—midnight to 8 a.m. was utilized for mining and timber.

I think it is quite safe to say that work on this job on 107th Street
20 between Jasper Avenue, and the lane south would be active for a period of at least six weeks.

Yours truly,

A. W. HADDOW,
City Engineer.

AWH/g.b.

(N.B.: The blueprint referred to which is part of Exhibit 93 is contained in book of plans.)

No. 92.

**Sections 24 to 42 inclusive of City of Edmonton By-law No. 20 of 1930.
(Defendant's Document)**

24. Any chimney, stack or metal extension to any chimney, stove-
30 pipe or smoke-pipe used in any building within the city shall be kept and maintained in good order and repair at all times, so as not to constitute or become a hazard or menace to surrounding property; and the same shall be repaired or extended, so as to remove any such hazard or menace, on written notice from the Chief or any Fire Marshal of the city.

Exhibits
and
Documents.

No. 93
Two Letters
from City
Engineer to
Plaintiffs'
Solicitors
3rd and 8th
February,
1934
continued.

No. 92
Sections
24 to 42
inclusive
of City of
Edmonton
By-law
No. 20
of 1930

Exhibits
and
Documents.

No. 92
Sections
24 to 42
inclusive
of City of
Edmonton
By-law
No. 20
of 1930
continued.

25. Every pipe or thimble hole not in actual use in any chimney in any building within the city shall be kept close with a register or stopper of metal; such register or stopper shall be tight-fitting over such pipe or thimble hole; and no owner or occupant of any such building shall permit or allow any such pipe or thimble hole not in use to remain open.

26. All hoods, vents and pipes over or leading from any range, oven or other similar device or fixture shall be kept clean and free from any grease and dirt at all times.

27. Whenever in any building, or upon any premises or other place, within the city, there shall exist or be any combustible or explosive material or materials, or any dangerous or unnecessary accumulation of rubbish, litter, waste-paper, shavings, or any other inflammable materials of a nature especially liable to fire, and such materials are so situated as to endanger property, or to obstruct ingress or egress in case of fire, or which may be liable to interfere with the operations of the Fire Department of the city, or where any conditions exist that are liable to cause fire, or to assist in the spread of fire, the same shall be rectified, altered or removed immediately on order of any Fire Marshal of the city accordingly, as may be directed in such order. 10

28. No person shall obstruct any fire escape, door, passage, hall window or other exit to any fire escape; and all fire escapes and exits leading thereto shall at all times be kept and maintained in good order and repair. 20

29. No persons shall store, place, maintain or permit to be stored, placed, kept or maintained in any part of any elevator shaft, in any building within the city, any combustible or inflammable or explosive compound or material; and the well of such elevator shafts shall at all times be kept clean and free from rubbish or litter.

30. No person shall store or keep any combustible or inflammable or explosive material or compound, or place, keep or maintain any garbage or ash cans or receptacles, in any air, light or ventilating shaft in any building within the city; such shafts shall at all times be kept clean and free from rubbish, litter or obstruction. 30

31. No person shall without reasonable cause or excuse make or circulate or cause to be made or circulated any alarm of fire, either by outcry, ringing of bells, or using or employing the fire alarm telegraph, or by telephone or in any other way, manner or by any other means whatsoever.

PART 3—HOTELS.

32. The owner or occupant of any building within the city of two 40 storeys or over in height which is used or maintained as a hotel, shall erect or cause to be erected thereon one or more fire escapes, as the case

may be, and such fire escape or escapes shall be constructed in accordance with the requirements of the bylaws of the city in that behalf.

Exhibits
and
Documents

33. No door to any exit leading to any fire escape in any building within the city shall be close fastened, except with a movable lock or bolt which may be readily opened from the inside without the aid of a key or similar device.

No. 92
Sections
24 to 42
inclusive
of City of
Edmonton
By-law
No. 20
of 1930

10 34. The location of all exits leading to fire escapes shall be conspicuously placarded at all times during the day; and exit lights over and indicating all exits leading to fire escapes shall be kept burning during the night from the period of one-half hour after sunset to one-half hour before sunrise as hereinafter provided.

continued.

35. (1) Exit globes, indicating exits of fire escapes shall be of ruby glass eight (8) inches in diameter, having the words "Fire Escape" or "Exit" etched thereon in legible letters at least one (1) inch high; provided, however, that wherever it is impracticable to place a globe a metal box having a ruby glass twelve (12) inches long and four (4) inches deep with the words "Fire Escape" or "Exit" etched thereon, may be used.

20 (2) The installation and number of all such exit lights shall be as directed by the Chief of the Fire Department, and shall be installed forthwith in accordance with the requirements of the electrical bylaws of the city in that behalf and under the supervision of the City Electrician of the city.

(3) The lights used in all such globes over or indicating exits leading to fire escapes shall be of not less than fifteen (15) watts.

30 36. The owner or occupant of every building within the city of two (2) storeys or over in height and used or maintained as a hotel shall provide and maintain in good and efficient working order an electric fire-gong system or other approved system, and the location and number of such fire-gongs and switches incidental thereto shall be as directed by the Chief. The installation of such fire-gongs and system shall be in accordance with the requirements of the electrical bylaws of the city in that behalf.

37. All halls, corridors and stairways of hotels within the city shall be kept adequately and properly lighted at all times.

38. No person shall keep, store or use or suffer or permit to be kept, stored or used any combustible, explosive or inflammable compound or material in any part of any building used or maintained as a hotel.

39. No person shall carry on the business of a garage, clothes-cleaning establishment, paint-mixing shop, vulcanizing establishment, oil or

Exhibits
and
Documents

—
No. 92
Sections
24 to 42
inclusive
of City of
Edmonton
By-law
No. 20
of 1930
continued.

gasoline station, or any other business, trade or process which is liable to cause fire or assist in the spread of fire, in any part of any building or premises used or occupied as a hotel. Provided clothes cleaning for guests in any hotel shall not be considered a breach of this section.

40. (1) The owner or keeper of every apartment house, tenement house, hotel, public rooming, boarding or lodging house or building or part of a building used as such, shall have each floor or storey thereof equipped with one two and one-half (2½) gallon or one three (3) gallon hand fire-extinguisher for each fifty (50) feet of hallway or fraction thereof; and such extinguishers shall be placed in the hallways so as to be readily accessible in case of fire. 10

(2) The owner or keeper of every restaurant shall have in such restaurant at least one such extinguisher.

(3) The owner or keeper of every garage where three (3) or more motor vehicles are kept, shall have in such garage at least one such extinguisher; provided that the above equipment shall not be required in such buildings where stand-pipes and hose are provided.

41. No licence to keep or conduct any of the aforesaid premises (if a license so to do be required by any of the bylaws of the city), shall be issued until the applicant shall produce to the Inspector of Licenses a certificate in writing of the Chief that the provisions of this by-law have been complied with. Provided that if any applicant for a license shall satisfy the inspector that he has ordered but is awaiting the delivery of the required extinguisher or extinguishers, the said inspector, with the consent of the City Commissioners, may issue the required license. 20

42. In the event of any owner or keeper licensed to keep any of the aforesaid premises neglecting or refusing to comply with the provisions aforesaid within thirty (30) days after being notified in writing so to do by the Chief, his license shall thereupon be reported to the Council for cancellation, unless the City Commissioners shall for good cause extend the time for compliance. This provision shall be in addition to but not in substitution for any penalty otherwise provided for such default. 30

Certified a true copy of Sections 24 to 42 (both inclusive) of By-law No. 20 of 1930 of the City of Edmonton.

“CHAS. ED. K. COX,”
City Clerk.

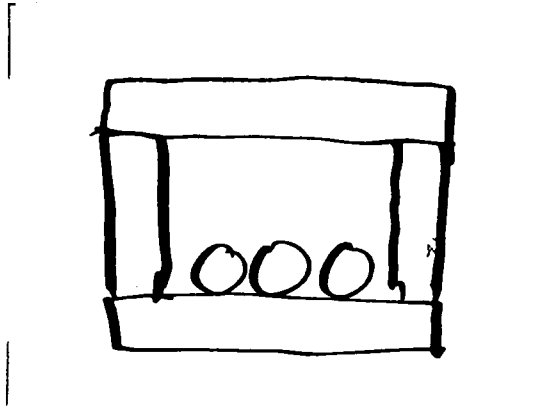
EXHIBIT 31.

Exhibits
and
Documents.

—
No. 31

Rough
sketch
showing
location of
three cables
in wooden
conduit box.

19th
January,
1934



No. 31

Rough sketch showing location of three
cables in wooden conduit box.

(Plaintiffs' Exhibit).

EXHIBIT 32.

Exhibits
and
Documents.

No. 32
Photograph
of
demolished
south wall
of Corona
Hotel after
the fire,
showing
wooden
conduit box.
14th
June,
1932



No. 32
Photograph of demolished south wall of Corona Hotel after the fire, showing wooden conduit box.
(Plaintiffs' Exhibit).

EXHIBIT 33.

Exhibits
and
Documents.

No. 33.
Photograph
of
demolished
south
wall
of
Corona
Hotel
after
the
fire,
showing
wooden
conduit
box.
14th
June,
1932



No. 33
Photograph of demolished south wall of Corona Hotel after the fire,
showing wooden conduit box.
(Plaintiffs' Exhibit)

EXHIBIT 54.

Exhibits
and
Documents.

No. 54

Photograph
of the south
wall of the
Corona
Hotel after
the fire,
showing
coal chutes
and air
shaft.
3rd May,
1932



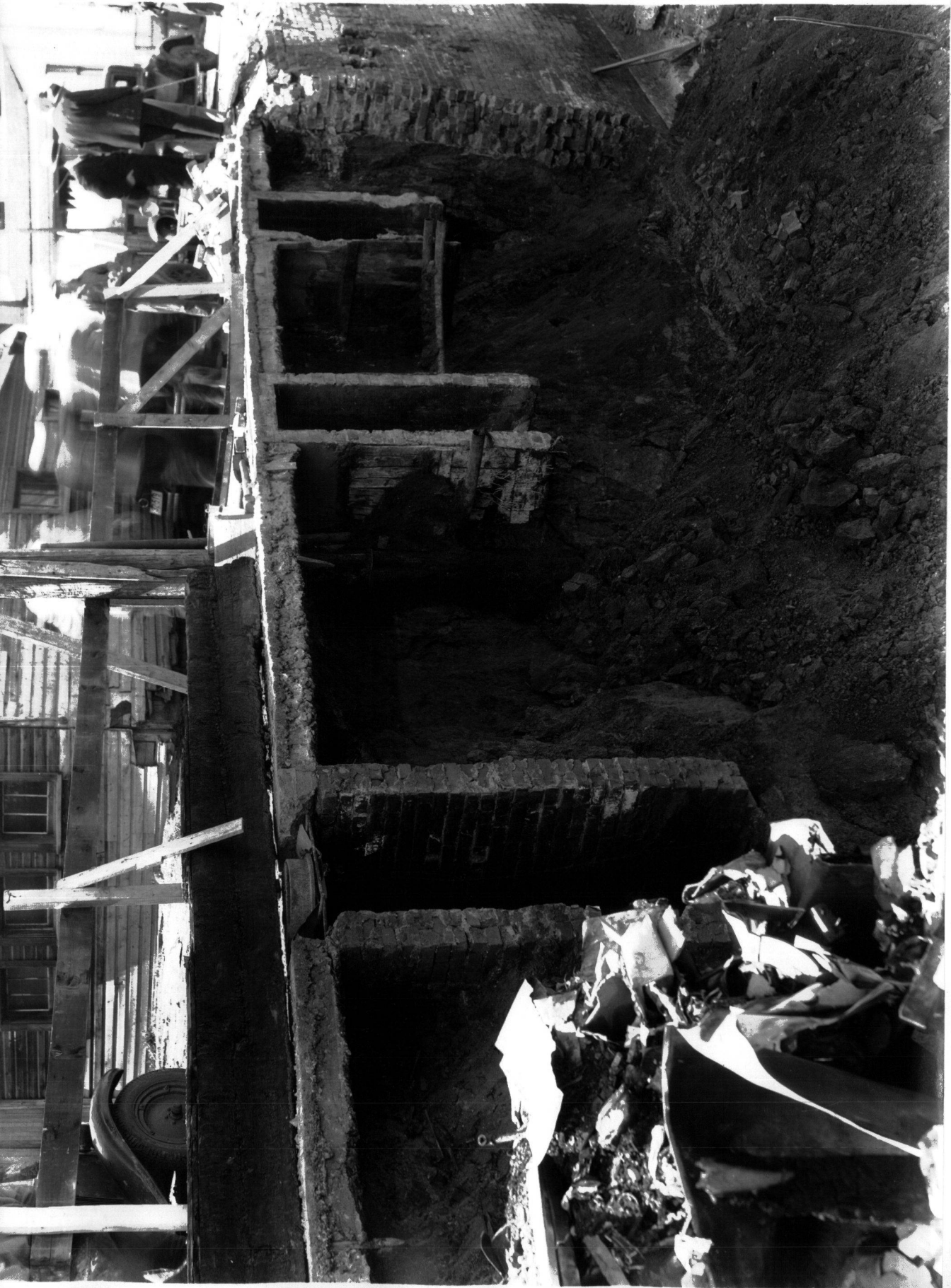
No. 54
Photograph of the south wall of the Corona Hotel, after the fire, showing
coal chutes and air shaft.
(Defendant's Exhibit).

EXHIBIT 55.

Exhibits
and
Documents.

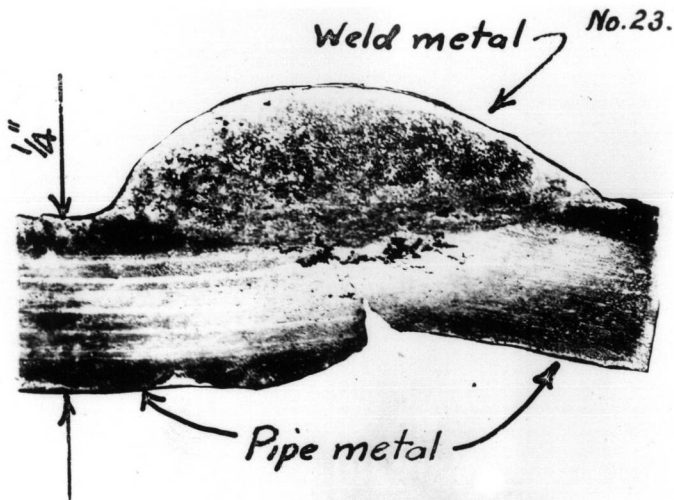
No. 55

Photograph
of the south
wall of the
Corona
Hotel
partly
demolished
showing
coal chutes
and air
shaft.
24th May,
1932



No. 55
Photograph of the south wall of the Corona Hotel partly demolished,
showing coal chutes and air shaft.
(Defendant's Exhibit).

EXHIBIT 45.



Exhibits
and
Documents

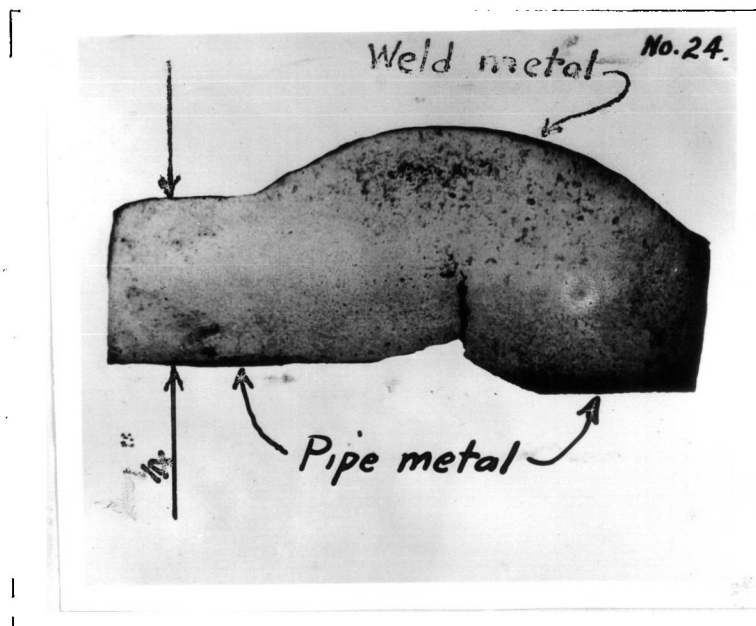
No. 45
Micro-
photograph
of the weld
west of the
broken
weld.
Undated

No. 45

Micro-photograph of section of the weld west of the broken weld.

(Plaintiffs' Exhibit)

EXHIBIT 46.



No. 46.
Micro-
photograph
of the weld
east of the
broken
weld.
Undated

No. 46

Micro-photograph of section of the weld east of the broken weld.

(Plaintiffs' Exhibit)

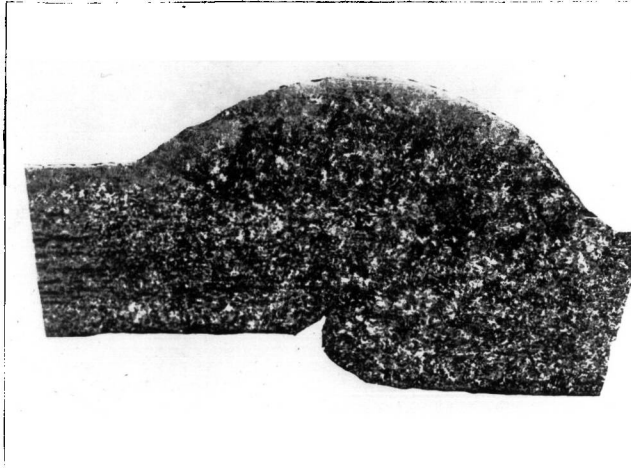
EXHIBIT 84.

Exhibits
and
Documents.

No. 84.
Photograph
of section
of weld.
(Exhibit 68)
Undated

CORONA HOTEL FIRE

Photograph of section of weld which failed in the
Intermediate Pressure Gas Main, 107th. Street.
Magnification $3\frac{1}{2}$ X.



Etched with Ammonium persulphate

No. 84
Photograph of section of weld (Exhibit 68).
(Plaintiffs' Exhibit)

EXHIBIT 72.

Exhibits
and
Documents

No. 72.
Photograph
of side view
of broken
weld.
(Exhibit 42)
Undated



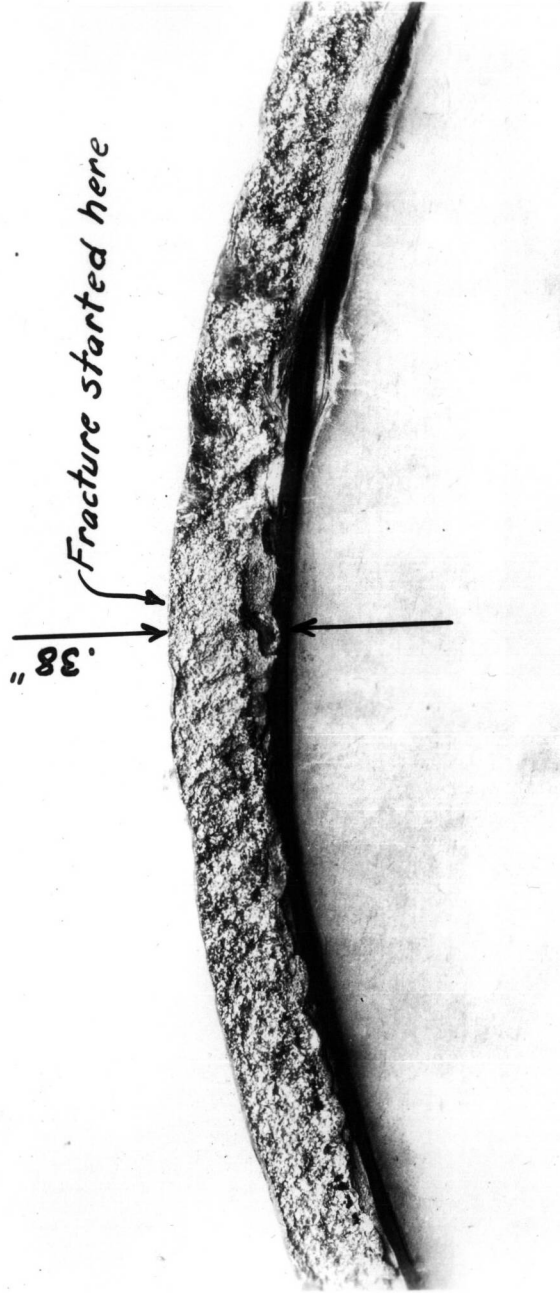
No. 72
Photograph of side view of broken weld (Exhibit 42).
(Plaintiffs' Exhibit)

EXHIBIT 44.

Exhibits
and
Documents.

No. 44
Photograph
of end view
of section
of broken
weld.
Undated

No. 28.

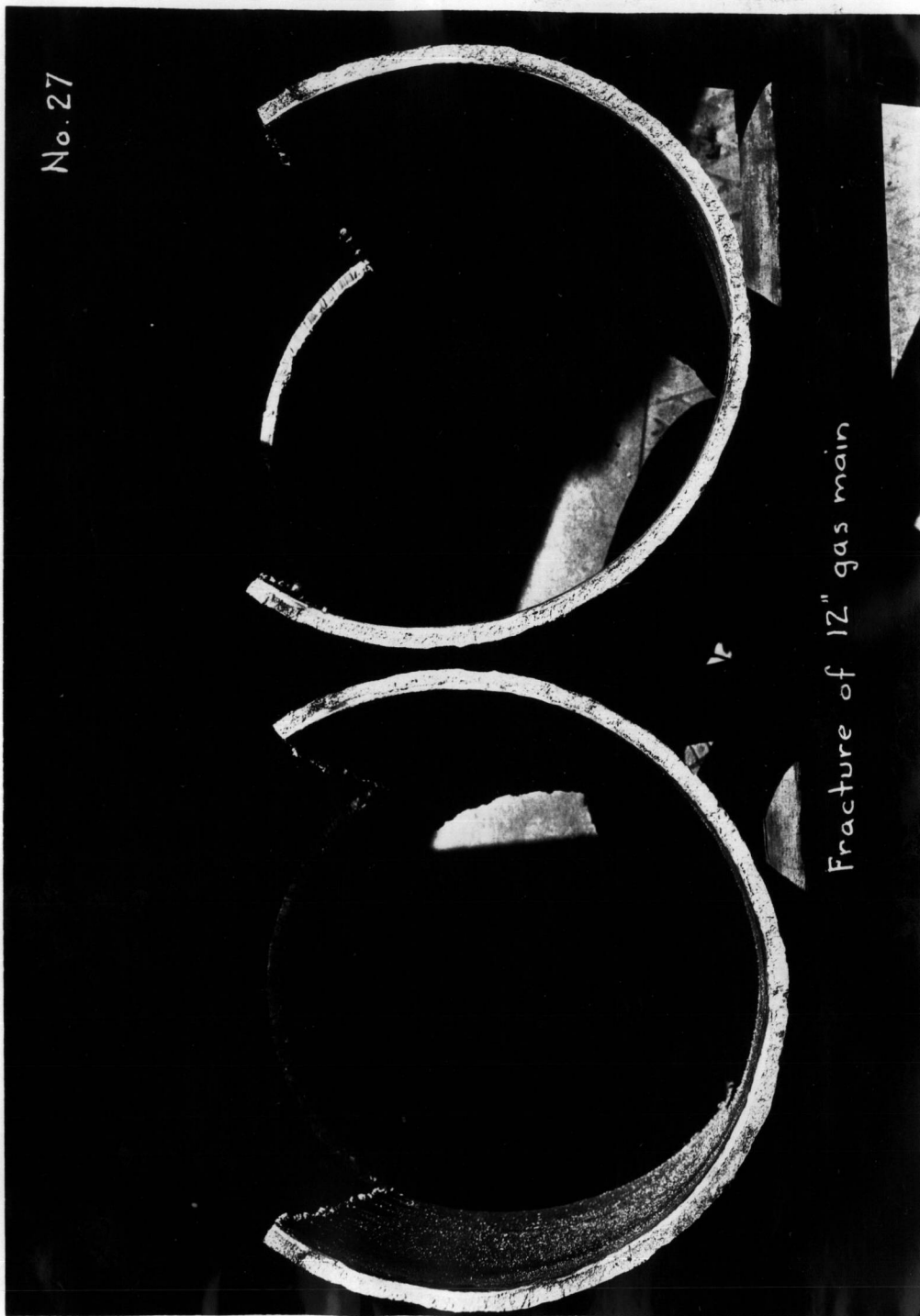


No. 44
Photograph of end view of section of broken weld.
(Plaintiffs' Exhibit).

EXHIBIT 73.

Exhibits
and
Documents.

No. 73
Photograph
of end view
of broken
weld
(Exhibit 42)
Undated



No. 73
Photograph of end view of broken weld (Exhibit 42).
(Plaintiffs' Exhibit).

EXHIBIT 77.

Exhibits
and
Documents

No. 77
Sketch of
end view
of gas pipe.
29th
January,
1934

23764

77

Linden Engineering Co vs The City of Vancouver
Whistler

SUPREME COURT

This is exhibit No.

the property of the

filed by the

this 26 day of Jan A.D. 1934

CLERK OF THE COURT EDMONTON

No. 77

Sketch of end view of gas pipe.
(Plaintiffs' Exhibit).

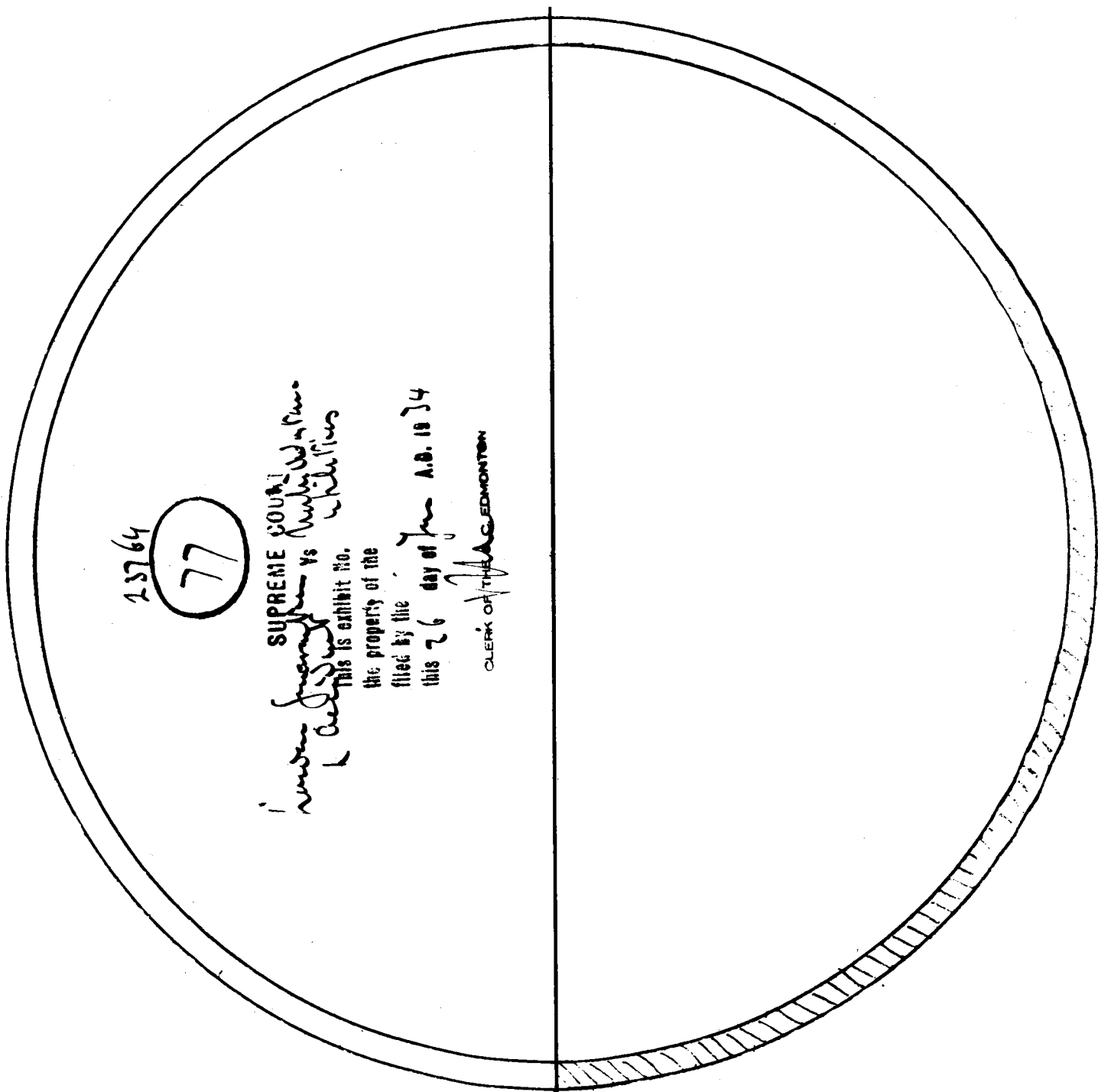
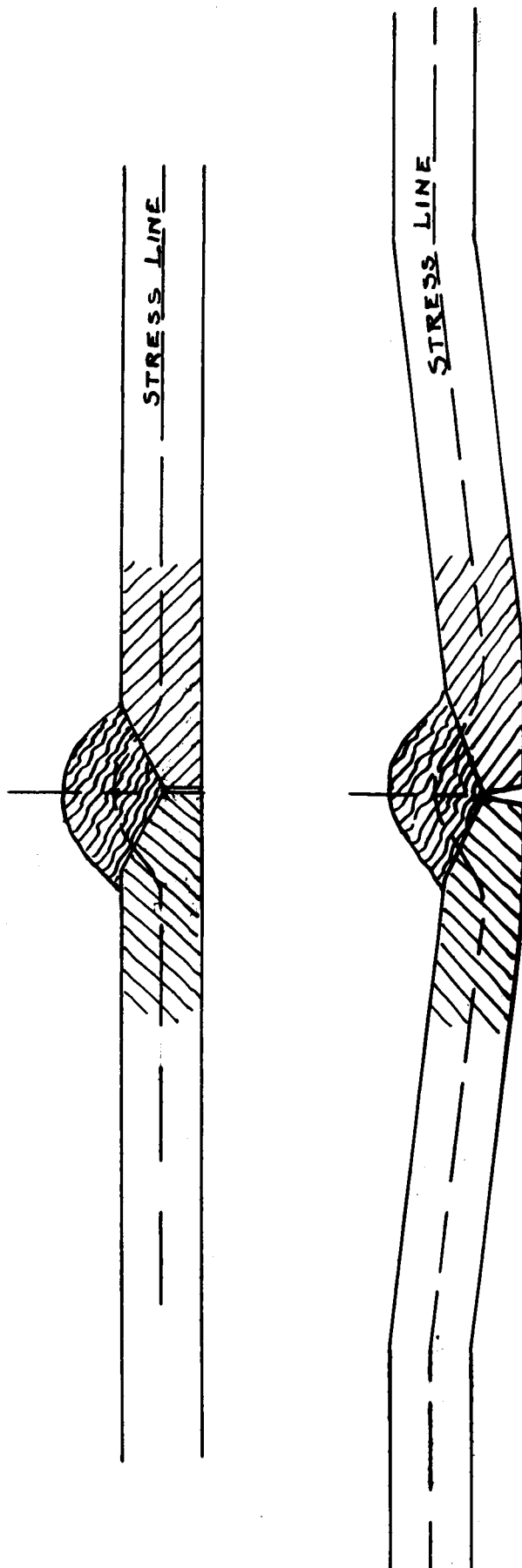


EXHIBIT 81.

Exhibits
and
Documents.

No. 81
Sketch of
welded
joint
showing
lines of
stress.
29th
January,
1934



No. 81
Sketch of welded joint showing lines of stress.
(Defendant's Exhibit).

EXHIBIT 69.

Exhibits
and
Documents

No. 69
Illustration
showing
laying of a
gas pipe
in a
slough.
Undated



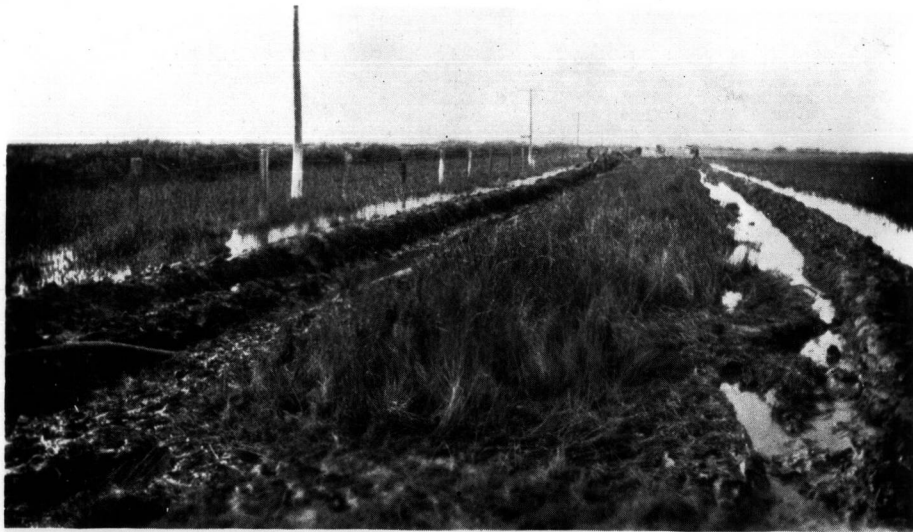
Floating Pipe Through Slough

No. 69

Illustration showing laying of a gas pipe in a slough.
(Defendant's Exhibit)

EXHIBIT 70.

No. 70.
Illustration
showing
laying of a
gas pipe in
a slough
Undated



Through a Slough

No. 70

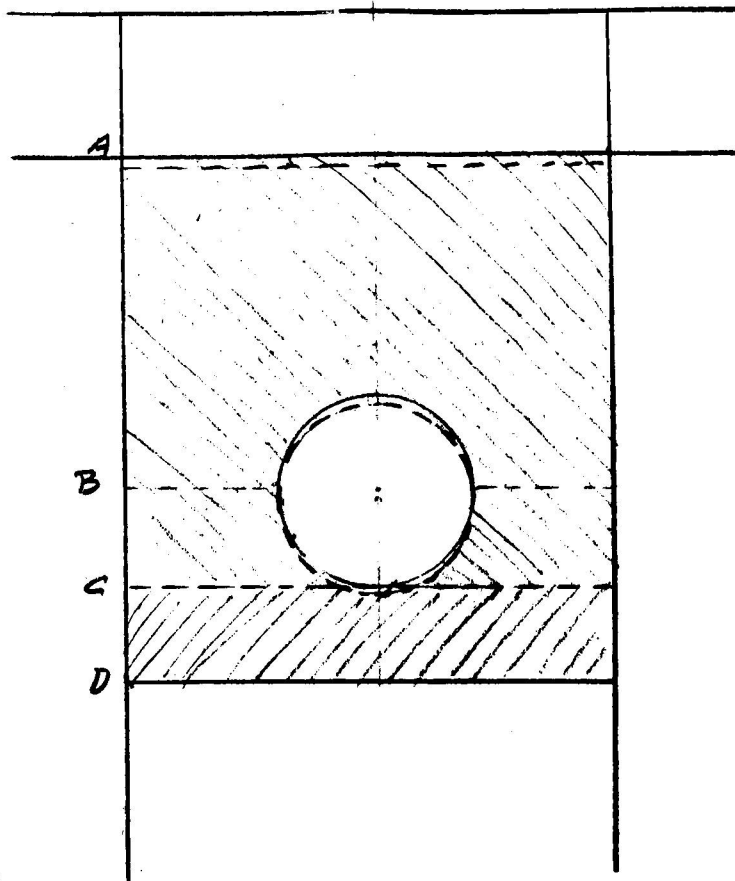
Illustration showing laying of a gas pipe in a slough.
(Defendant's Exhibit)

EXHIBIT 71.

Exhibits
and
Documents.

No. 71.

Rough
sketch
showing
cross-
section of
pavement
and gas pipe
at 107th
Street.
25th Janu-
ary, 1934



No. 71

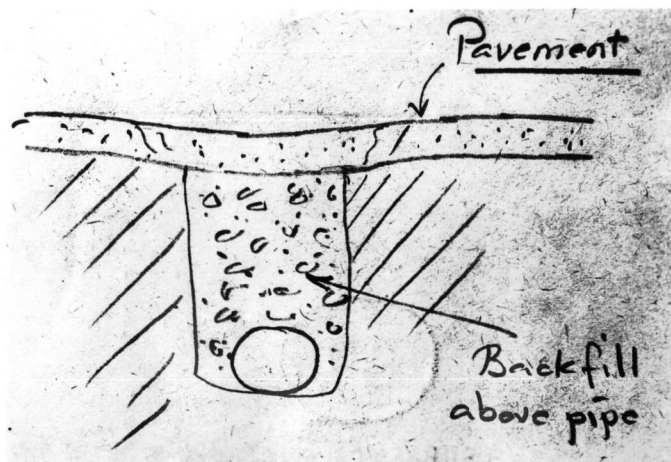
Rough sketch showing cross-section of pavement and gas pipe
at 107th Street.

(Defendant's Exhibit)

EXHIBIT 87.

No. 87.

Sketch
showing
pavement
and back-
filling
material
over pipe.
31st Janu-
ary, 1934



No. 87

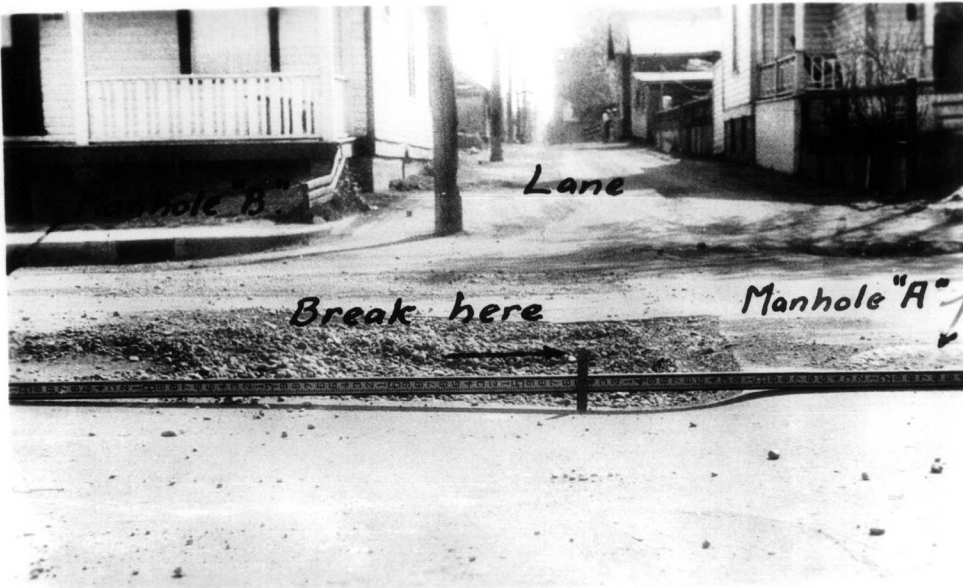
Sketch showing pavement and backfilling over pipe.

(Plaintiffs' Exhibit)

EXHIBIT 74.

Exhibits
and
Documents

No. 74.
Photograph
showing
sag in
pavement
at 107th
Street.
12th May,
1932

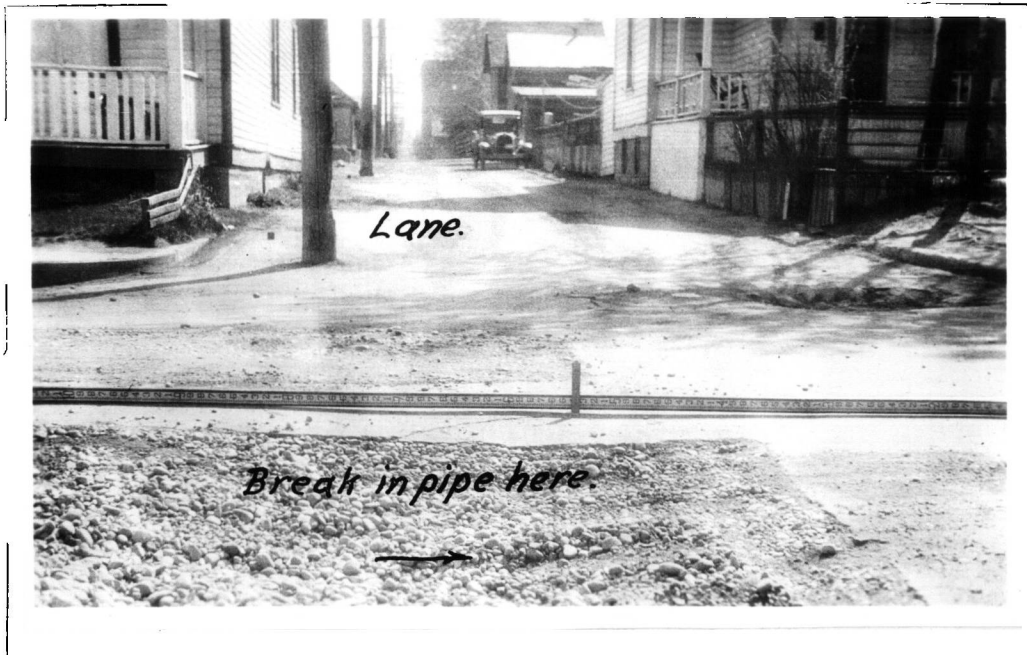


No. 74

Photograph showing sag in pavement at 107th Street.
(Plaintiffs' Exhibit)

EXHIBIT 75.

No. 75
Photograph
showing
sag in
pavement
at 107th.
Street.
12th May,
1932



No. 75

Photograph showing sag in pavement at 107th Street.
(Plaintiffs' Exhibit)

EXHIBIT 88.

Exhibits
and
Documents

No. 88

Rough
sketch
showing
bend in
pipe.
1st Feb-
ruary,
1934



6.8

Feb 21/34-

No. 88
Rough sketch showing bend in pipe.
(Plaintiffs' Exhibit).

- No. 4.—Sketch Showing Layout of Basement of Corona Hotel. (See Book of Plans.)
(Plaintiffs' Exhibit).
No. 4
6th
January,
1934
-
- No. 10.—Blueprint Showing Underground Utilities at Intersection of 107th Street and Lane. (See Book of Plans.)
(Plaintiffs' Exhibit).
No. 10
25th
February,
1932
-
- No. 18.—Plan of Lane and Land Adjoining Corona Hotel. (See Book of Plans.)
(Plaintiffs' Exhibit).
No. 18
Undated
-
- 10 No. 28.—Plan Showing Location and Elevation of Utilities at Intersection of 107th Street and Lane. (See Book of Plans.)
(Plaintiffs' Exhibit).
No. 28
13th
August,
1932
-
- No. 37.—Plan of Construction of Gas Distribution System on Lane South of Jasper Avenue. (See Book of Plans.)
(Defendant's Exhibit).
No. 37
2nd
August,
1923
-
- No. 41.—Plan Showing Location of Underground utilities at intersection of 107th Street and Lane. (See Book of Plans.)
(Plaintiffs' Exhibit).
No. 41
28th
July,
1932
-
- 20 No. 2.—A Bundle of Insurance Policies Made Between the Various Plaintiff Insurance Companies and the Insured Plaintiffs. (Not Printed.)
(Plaintiffs' Exhibit).
No. 2
Various
Dates
-
- No. 3.—A bundle of Subrogation receipts in respect of the amounts paid by the Various Plaintiff Insurance Companies to the Insured Plaintiffs. (Not Printed.)
(Plaintiffs' Exhibit).
No. 3
Various
Dates

No. 16
January,
and
February,
1932

No. 16.—Statement showing quantity of Opex distribution stock owned by Sherwin-Williams Company of Canada Limited, on consignment to the Motor Car Supply Company, Limited, as of December 31st, 1931, and Statement of Sales of Opex distribution stock from January 1st, 1932, to February 22nd, 1932.

(Not printed.)

(Defendant's Exhibit).

No. 17
31st
January,
1932

No. 17.—Bound book of Dimensions Eleven Inches by Nine and Two-thirds Inches by One and Two-thirds Inches Containing an Inventory of the Stock of the Motor Car Supply Company, Limited, as of January 31st, 1932. (Not Printed.)

10

(Defendant's Exhibit).

No. 5
10th
January,
1934

No. 5.—Plan of Ground Floor of Corona Hotel. (Not Printed.)

(Plaintiffs' Exhibit).

No. 14
March,
1932

No. 14.—Plan of Ground Floor of Corona Hotel, Showing the Relative Location of the Various Rooms in the Hotel and the Premises of the Motor Car Supply Company, Limited, to the East of the Hotel and the Barber Shop to the West of the Hotel. (Not Printed.)

(Plaintiffs' Exhibit).

No. 15
15th
January,
1934

No. 15.—Rough Pencil Sketches Showing the Relative Location of the Various Articles of Merchandise Stored on the Premises of the Motor Car Supply Company, Limited, on the Ground Floor and in the Basement. (Not Printed.)

(Plaintiffs' Exhibit).

No. 56
18th
May,
1932

No. 56.—Plan Showing the Hotel Site and the Details of the Utilities Located at the Intersection of 107th Street and the Lane South of Jasper Avenue. (Not Printed.)

(Plaintiffs' Exhibit).

No. 57.—Plan of Corona Hotel Basement. (Not Printed.)
(Plaintiffs' Exhibit).

No. 57
29th
July,
1932

No. 7.—Rough sketch Drawn by Julian Garrett, Showing Location of Gas Regulator Stations and the Intermediate Pressure line of Northwestern Utilities Limited, on the Lane Immediately South of Jasper Avenue. (Not Printed.)
(Plaintiffs' Exhibit).

No. 7
20th
January,
1933

No. 19.—Photograph of Garbage Burner in the Basement of Corona Hotel, Taken After the Fire. (Not Printed.)
(Plaintiffs' Exhibit).

No. 19
Undated

10 No. 20.—Photograph Showing Debris of the Corona Hotel, After the Fire. (Not Printed.)
(Defendant's Exhibit).

No. 20
25th
February,
1932

No. 21.—Photograph of South Basement Wall of Corona Hotel, After the Fire, Showing Light Conduit No. 7. (Not Printed.)
(Plaintiffs' Exhibit).

No. 21
Undated

No. 22.—Photograph of South Basement Wall of Corona Hotel, After the Fire, Showing Light Conduit No. 8. (Not Printed.)
(Plaintiffs' Exhibit).

No. 22
Undated

20 No. 23.—Photograph of South Basement Wall of Corona Hotel, After the Fire, Where Conduit Enters. (Not Printed.)
(Defendant's Exhibit).

No. 23
25th
February,
1932

No. 24.—Photograph of South Basement Wall of Corona Hotel, After the Fire, Showing Door and Conduits. (Not Printed.)
(Defendant's Exhibit).

No. 24
25th
February,
1932

No. 25
Undated

No. 25.—Photograph of South Basement Wall of Corona Hotel, After the Fire, Showing Conduits. (Not Printed.)
(Defendant's Exhibit).

No. 35
Undated

No. 35.—Photograph of Gas Service Pipe Entering South Basement Wall of Corona Hotel. (Not Printed.)
(Plaintiffs' Exhibit).

No. 36
3rd
May,
1932

No. 36.—Photograph Showing Relative Position of Gas Service Pipe Entering South Basement Wall of Corona Hotel. (Not Printed.)
(Plaintiffs' Exhibit).

No. 38
Undated

No. 38.—Photograph of Trench for Laying of Gas Mains Near Edmonton Post Office. (Not Printed.) 10
(Defendant's Exhibit).

No. 47
Undated

No. 47.—Photograph Showing the Electric Light and Power Conduit Entering the Basement of the Corona Hotel. (Not Printed.)
(Plaintiffs' Exhibit).

No. 48
Undated

No. 48.—Photograph Showing Part of the South Wall of the Corona Hotel After the Fire. (Not Printed.)
(Plaintiffs' Exhibit).

No. 49
Undated

No. 49.—Photograph Showing Soot Marks on the Bricks of the South Basement Wall of the Corona Hotel. (Not Printed.) 20
(Plaintiffs' Exhibit).

No. 50
February,
1932

No. 50.—Photograph of Barometrical Chart for February 1932. (Not Printed.)
(Plaintiffs' Exhibit).

- No. 51.—Photograph of South Wall of Basement of the Corona Hotel, Showing Spawling of the Bricks and the Burnt Joists. (Not Printed.)
(Plaintiffs' Exhibit).
No. 51
26th
March,
1932
-
- No. 52.—Photograph of the South Wall of the Corona Hotel After the Debris Had Been Removed. (Not Printed.)
(Plaintiffs' Exhibit).
No. 52
3rd
May,
1932
-
- No. 53.—Photograph of the Northern Part of the East Wall of the Corona Hotel After the Fire. (Not Printed.)
(Plaintiffs' Exhibit).
No. 53
3rd
May,
1932
-
- 10 No. 58.—Photograph of South Wall of Basement of Corona Hotel After the Fire, Showing Coal Chute. (Not Printed.)
(Plaintiffs' Exhibit).
No. 58
3rd
May,
1932
-
- No. 59.—Photograph of Part of the West Wall of the Corona Hotel After the Fire. (Not Printed.)
(Plaintiffs' Exhibit).
No. 59
3rd
May,
1932
-
- No. 60.—Photograph of the South Wall of the Corona Hotel After the Fire, Taken From a Distance. (Not Printed.)
(Plaintiffs' Exhibit).
No. 60
Undated
-
- 20 No. 61.—Photograph looking down the Coal Chute Showing the Walls. (Not Printed.)
(Plaintiffs' Exhibit).
No. 61
Undated
-
- No. 62.—Photograph looking down Coal Chute Showing the Walls. (Not Printed.)
(Plaintiffs' Exhibit).
No. 62
Undated

No. 63
24th
May,
1932

No. 63.—Photograph of the South Wall of the Corona Hotel After the Fire Showing the Coal Chute. (Not Printed.)
(Plaintiffs' Exhibit).

No. 64
24th
May,
1932

No. 64.—Photograph of the South Wall of the Corona Hotel After the Fire to the West of the View Shown on Exhibit 63. (Not Printed.)
(Plaintiffs' Exhibit).

No. 26
Undated

No. 26.—Small Poplar Pole Twelve Inches in Length by Three Inches in Diameter. (Separate Exhibit.)
(Plaintiffs' Exhibit).

No. 27
Undated

No. 27.—Parcel Containing Eight Irregular Shaped Stones, Ranging from the Smallest, One Inch in Diameter, to the Largest, Four Inches by Two and a Half Inches by Two Inches, Taken from the Trench After the Intermediate Pressure Main Was Removed in June 1932. (Separate Exhibit.)
(Plaintiffs' Exhibit).

No. 29
Undated

No. 29.—Four Large Sacks of Back-filling Material Taken From the Rear of the Corona Hotel. (Separate Exhibit.)
(Plaintiffs' Exhibit)

No. 34
Undated

No. 34.—Smoke Testing Machine Consisting of Chambers to Contain Air and Burner Material and Pump to Expel smoke from Machine. (Separate Exhibit.)
(Plaintiffs' Exhibit)

20

No. 42
Undated

No. 42.—Two Sections Each of About Three and a Half Inches in Length of the Twelve Inch Intermediate Pressure Main, Taken from Each Side of the Portion of the Welded Joint at the Centre of the Intersection of 107th Street and the Lane South of Jasper Avenue, which Broke. (Separate Exhibit.)
(Plaintiffs' Exhibit)

- No. 43.—Section of the upper part of the twelve-inch intermediate pressure main about two feet in length including that part of the weld at the centre of 107th Street and the lane South of Jasper Avenue, which did not break. (Separate Exhibit.) (Plaintiffs' Exhibit) No. 43 Undated
-
- No. 65.—Small portion of the actual weld to the East of the weld which broke. (Separate Exhibit.) (Plaintiffs' Exhibit). No. 65 Undated
-
- 10 No. 66.—Actual pieces of the weld to the East of the weld which broke. (Separate Exhibit.) (Plaintiffs' Exhibit) No. 66 Undated
-
- No. 67.—Actual pieces of the weld to the West of the weld which broke. (Separate Exhibit.) (Plaintiffs' Exhibit) No. 67 Undated
-
- No. 68.—A small section of the twelve-inch intermediate pressure main containing a part of the centre weld at 107th Street and the lane South of Jasper Avenue, which did not break. This section was cut out from the section, Exhibit 43. (Separate Exhibit) (Plaintiffs' Exhibit) No. 68 Undated
-
- 20 No. 76.—Broken weld coupons. (Separate Exhibit.) (Defendant's Exhibit). No. 76 Undated
-
- No. 83.—Example of weld icicles. (Separate Exhibit.) (Defendant's Exhibit). No. 85 Undated
-
- No. 85.—Twelve fractured ends from the tested weld coupons taken from the welds to the East and West of the centre weld which broke. (Separate Exhibit.) (Defendant's Exhibit). No. 83 Undated

No. 30
Undated

No. 30.—Wooden model prepared by the City Engineer to indicate the relative location and elevation of the various underground utilities at the intersection of 107th Street and the lane South of Jasper Avenue. (Separate Exhibit.)

(Plaintiffs' Exhibit).

No. 39
Undated

No. 39.—Wooden model of manhole "A" and weir chamber. (Separate Exhibit.)

(Defendant's Exhibit).

No. 82
Undated

No. 82.—A model prepared by Mr. Ewertz consisting of a strip of rubber designed to represent a cross-section of a welded pipe joint to illustrate the stresses created in the joint by pulling and bending. (Separate Exhibit.)

(Defendant's Exhibit).

10

No. 86
Undated

No. 86.—Wooden model prepared by Northwestern Utilities Limited, showing the location and elevation of the underground utilities at the intersection of 107th Street and the lane South of Jasper Avenue. (Separate Exhibit.)

(Defendant's Exhibit).

No. 89
Undated

No. 89.—Tile sewer pipe two feet six inches in length with a diameter of six inches. (Separate Exhibit.)

(Plaintiffs' Exhibit).

In the Privy Council.

No. of 1935.

*On Appeal from the Supreme Court of Alberta
(Appellate Division)*

BETWEEN

NORTHWESTERN UTILITIES LIMITED
(Defendant) Appellant,

AND

LONDON GUARANTEE & ACCIDENT
COMPANY, LIMITED, AND OTHERS,
(Plaintiffs) Respondents.

RECORD OF PROCEEDINGS

VOLUME II.

Page 451 to Page 900

CHARLES RUSSELL & CO.,
37, Norfolk Street, Strand,
W.C.2.

For the Appellant.

BLAKE & REDDEN,
17, Victoria Street,
S.W.1.

For the Respondents.