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2, 1952

UNIVERSITY OF LONDON
No. 40 of 1950.

In The Privy Council - 9 JUL 1953

INSTITUTION FOR ADVANCED
LEGAL STUDIES

ON APPEAL FROM THE SUPREME COURT OF CANADA

BETWEEN :

MINERALS SEPARATION NORTH AMERICAN
CORPORATION,

Appellants

—AND—

NORANDA MINES, LIMITED,

Respondents.

RECORD OF PROCEEDINGS

VOLUME 2

PAGES 241—484

BIRD & BIRD,
5-11 Theobald's Road,
London, W.C.1,
Appellants' Solicitors.

LAWRENCE JONES & CO.,
Winchester House,
Old Broad Street,
London, E.C.2,
Respondents' Solicitors.

In The Supreme Court of Canada

ON APPEAL FROM THE EXCHEQUER COURT OF CANADA

BETWEEN :

NORANDA MINES, LIMITED,

Appellant;

— AND —

MINERALS SEPARATION NORTH AMERICAN
CORPORATION,

Respondent.

APPEAL CASE

— VOLUME 2 —

HOLDEN, MURDOCH, WALTON, FINLAY & ROBINSON,
Solicitors for Appellant.

SMART & BIGGAR,
Ottawa Agents for Solicitors for Appellant.

EWART, SCOTT, KELLEY & HOWARD,
Solicitors for Respondent.

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| D-84 | U.S. Patent 835,120 Sulman | Nov. 6, 1906 | III | 673 | | | II | 419 |
| D-85 | U.S. Patent 962,678 Sulman | June 28, 1910 | III | 679 | | | II | 419 |
| D-86 | Chart of Organic radicals ..... | ..... | ..... | ..... | I | 34 | II | 420 |
| D-87 | Chart of Glycerol and Cellulose and their radicals ..... | ..... | ..... | ..... | I | 35 | II | 435 |
| P-88 | Copy of pages of Richter's Chemistry | 1929 | V | 1019 | ..... | ..... | II | 459 |
| D-89A | Assay certificate | Oct. 13, 1944 | V | 1037 | ..... | ..... | III | 506 |
| D-89B | Assay certificate | Oct. 17, 1944 | V | 1038 | ..... | ..... | III | 506 |
| D-59A | Result of flotation tests at Noranda | Oct. 29, 1944 | V | 1036 | ..... | ..... | III | 506 |
| D-90 | Laboratory notebook of R. L. Bennett | Aug.— Sept. 1944 | ..... | ..... | ..... | ..... | III | 507 |
| D-91 | Lr. Quigley to Nutter | April 28, 1921 | IV | 760 | ..... | ..... | III | 577 |
| D-92 | Tel. Plaintiff to Nutter | May 25, 1923 | IV | 803 | ..... | ..... | III | 577 |
| D-93 | Tel. Nutter to Morrow | July 5, 1923 | IV | 817 | ..... | ..... | III | 577 |
| D-94 | Tel. Lewis to Nutter | Aug. 6, 1923 | IV | 833 | ..... | ..... | III | 577 |
| D-95 | Tel. Nutter to Lewis | Aug. 6, 1923 | IV | 834 | ..... | ..... | III | 578 |
| D-96 | Lr. Anaconda to Nutter | Aug. 8, 1923 | IV | 836 | ..... | ..... | III | 578 |
| D-97 | Lr. Nutter to Plaintiff | Aug. 30, 1923 | IV | 841 | ..... | ..... | III | 578 |
| D-98 | Tel. G. W. El. Chem. Co. to Nutter | Sept. 5, 1923 | IV | 844 | ..... | ..... | III | 578 |
| D-99 | U.S. Patent 1,364,304 Perkins | Jan. 4, 1921 | IV | 754 | ..... | ..... | III | 579 |
| P-100 | Supplemental report of tests on Anaconda ore | Jun.-Jul. 1923 | IV | 814 | ..... | ..... | III | 581 |
| P-101 | Lr. Lewis to Nutter | Aug. 7, 1923 | IV | 835 | ..... | ..... | III | 582 |
| P-102 | Lr. Martin to Gregory | May 25, 1915 | IV | 716 | ..... | ..... | III | 636 |
| P-103 | Martin Bulletin No. 1 | 1915 | ..... | ..... | ..... | ..... | III | 640 |
| P-104 | Martin's specifications (Higgins' copy) (Duplicate of W-5 except for Higgins' notes) | Mar. 9, 1915 | ..... | ..... | I | 1-12 | III | 640 |
| P-105 | Martin's Bulletin No. 3 | Sept. 20, 1915 | IV | 733 | ..... | ..... | III | 644 |
| P-106 | Martin's Bulletin No. 4 | Sept. 20, 1915 | IV | 735 | ..... | ..... | III | 645 |
| P-107 | Lr. Higgins to Williams | Dec. 11, 1915 | IV | 737 | ..... | ..... | III | 646 |
| P-108 | Index to Martin Bulletins | 1915 — 23 | IV | 739 | ..... | ..... | III | 648 |
| D-109 | Lr. Martin to Gregory | June 3, 1926 | V | 976 | ..... | ..... | III | 667 |
| D-110 | Lr. Plaintiff to Martin | June 3, 1926 | V | 977 | ..... | ..... | III | 667 |
| D-111 | Lr. Martin to Roberts | June 6, 1926 | V | 977 | ..... | ..... | III | 667 |
| D-112 | Lr. Plaintiff to Martin | June 7, 1926 | V | 978 | ..... | ..... | III | 667 |
| D-113 | Lr. Martin to Plaintiff | June 12, 1926 | V | 978 | ..... | ..... | III | 667 |
| D-114 | Lr. Plaintiff to Martin | June 14, 1926 | V | 979 | ..... | ..... | III | 667 |
| D-115 | Lr. Martin to Nutter | June 28, 1926 | V | 979 | ..... | ..... | III | 668 |
| D-116 | Lr. Nutter to Martin | July 6, 1926 | V | 980 | ..... | ..... | III | 668 |
| P-117 | Table of consumption of flotation reagents in 1923 | April 1926 | IV | 875 | ..... | ..... | ..... | ..... |
| M-4A | Lr. Dft. to Plf. | Dec. 8, 1925 | V | 983 | ..... | ..... | ..... | ..... |
| M-4B | Lr. Plf. N.Y. to Plf. San Francisco | Dec. 11, 1925 | V | 983 | ..... | ..... | ..... | ..... |
| M-4C | Lr. Dft. to Plf. | Dec. 28, 1925 | V | 984 | ..... | ..... | ..... | ..... |
| M-4D | Lr. Plf. to Dft. | Mar. 9, 1926 | V | 985 | ..... | ..... | ..... | ..... |
| M-4E | Lr. Plf. to Dft. | Aug. 2, 1930 | V | 986 | ..... | ..... | ..... | ..... |
| M-4F | Lr. Plf. to Dft. | Aug. 12, 1930 | V | 987 | ..... | ..... | ..... | ..... |
| M-4G | Lr. Plf. to Dft. | Nov. 1, 1931 | V | 988 | ..... | ..... | ..... | ..... |
| M-4H | Lr. Dft. to Plf. | Nov. 10, 1932 | V | 990 | ..... | ..... | ..... | ..... |
| M-4I | Lr. Plf. to Dft. | Nov. 16, 1932 | V | 992 | ..... | ..... | ..... | ..... |
| M-4J | Lr. Plf. to Dft. | Nov. 17, 1932 | V | 993 | ..... | ..... | ..... | ..... |
| M-4K | Lr. Plf. to Dft. | April 4, 1934 | V | 994 | ..... | ..... | ..... | ..... |
| M-4L | Lr. Plf. to Dft. | April 24, 1934 | V | 994 | ..... | ..... | ..... | ..... |
| M-4M | Lr. Dft. to Plf. | May 23, 1934 | V | 995 | ..... | ..... | ..... | ..... |
| M-4N | Lr. Plf. to Dft. | May 25, 1934 | V | 995 | ..... | ..... | ..... | ..... |
| M-4O | Lr. Plf. to Dft. | July 16, 1934 | V | 996 | ..... | ..... | ..... | ..... |
| M-4P | Lr. Dft. to Plf. | July 18, 1934 | V | 996 | ..... | ..... | ..... | ..... |
| M-4Q | Lr. Plf. to Dft. | July 20, 1934 | V | 997 | ..... | ..... | ..... | ..... |
| M-4R | Lr. Dft. to Plf. | Nov. 2, 1934 | V | 997 | ..... | ..... | ..... | ..... |
| M-4S | Lr. Plf. to Dft. | Nov. 14, 1934 | V | 998 | | | | |
| M-4T | Lr. Dft. to Plf. | Nov. 21, 1934 | V | 999 | | | | |

EXHIBITS — (Continued)

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| M-4U | Lr. Plf. to Dft. | Nov. 26, 1934 | V | 999 | | | | |
| M-4V | Lr. Dft. to Plf. | Jan. 15, 1935 | V | 1000 | | | | |
| M-4W | Lr. Dft. to Plf. | Feb. 12, 1935 | V | 1000 | | | | |
| M-4X | Lr. Plf. to Dft. | Feb. 14, 1935 | V | 1001 | | | | |
| M-4Y | Lr. Plf. to Dft. | Feb. 7, 1936 | V | 1001 | | | | |
| M-4Z | Lr. Dft. to Plf. | Feb. 12, 1936 | V | 1002 | | | | |
| M-4AA | Lr. Plf. to Dft. | Feb. 13, 1936 | V | 1003 | | | | |
| M-4BB | Lr. Dft. to Plf. | Feb. 17, 1936 | V | 1004 | | | | |
| M-4CC | Lr. Plf. to Dft. | Feb. 18, 1936 | V | 1004 | | | | |
| M-4DD | Lr. Plf. to Dft. | Mar. 31, 1936 | V | 1005 | | | | |
| M-4EE | Lr. Dft. to Plf. (Duplicate of Ex. M-3) ... | April 1, 1936 | V | 1005 | | | | |
| M-4FF | Lr. Plf. to Dft. | April 2, 1936 | V | 1006 | | | | |
| M-4GG | Lr. Plf. to Dft. | April 23, 1936 | V | 1006 | | | | |
| M-4HH | Lr. Dft. to Plf. | April 25, 1936 | V | 1007 | | | | |
| M-4II | Lr. Plf. to Dft. | April 27, 1936 | V | 1007 | | | | |
| M-4JJ | Lr. Plf. to Dft. | May 26, 1936 | V | 1008 | | | | |
| M-4KK | Lr. Dft. to Plf. | May 28, 1936 | V | 1008 | | | | |

PART IV — JUDGMENTS, ETC.

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For Plaintiff—H. D. Williams—Direct

Testimony of HENRY D. WILLIAMS in behalf of the plaintiff, taken, under commission issued herein on the 13th day of January, 1944, and pursuant to arrangement and agreement between counsel, at the office of Henry D. Williams, Esq., No. 225 Broadway, in the Borough of Manhattan, City, County, and State of New York, in the United States of America, before Augusta P. Boos, of 220 Broadway, New York, New York, the commissioner named in the said commission.

APPEARANCES:

10 FOR PLAINTIFF:

MR. W. L. SCOTT, K.C., of Ottawa, Canada,
MR. HENRY COHEN, of 70 Pine Street, New
York, New York;

FOR DEFENDANT:

MR. RUSSEL S. SMART, K.C.,
MR. P. C. FINLAY, of Ottawa, Canada.

HENRY D. WILLIAMS, having been first duly sworn by the commissioner, testified as follows:

DIRECT-EXAMINATION BY MR. COHEN:

20 Q. 1.—Mr. Williams, please state your full name, age, residence, and occupation. A.—Henry D. Williams; age, eighty; residence, 308 West 105th Street, New York City; occupation, lawyer, practising especially in patents, although I have now retired from the active practice of the law.

Q. 2.—What has your experience been in chemical and metallurgical matters, Mr. Williams? A.—I was educated at Cooper Union, New York City, in mechanical engineering and general science. I received the degree of Bachelor of Science of that institution and later received the degree of Mechanical Engineer. After
30 my graduation from that institution, I took up a course of chemical analysis, and I worked for a whole year in a chemical laboratory, following my two years of lectures, so that I was very well prepared in chemical matters.

Q. 3.—When were you first retained by Minerals Separation, Limited? A.—In 1911.

Q. 4.—Will you describe briefly the scope of your retainer for that company and its successor companies. A.—I was in general charge of patent applications and patent litigation. I started in
40 with an opinion as to patents and followed it shortly by the institution of a suit against an infringer.

For Plaintiff—H. D. Williams—Direct

Q. 5.—Was it Mr. Hyde? A.—Mr. Hyde. And suits followed in succession against Miami Copper Company, Butte & Superior Copper Company, and Magma Copper Company.

Q. 6.—You were in charge, Mr. Williams, were you not, of the patenting of all inventions for Minerals Separation, Limited, Minerals Separation American Syndicate (1913) Limited, and Minerals Separation North American Corporation, in the United States? A.—Yes.

Q. 7.—Do you know Retherford B. Martin? A.—Yes.

10 Q. 8.—When did you first meet him, Mr. Williams? A.—My diary has a record of my first meeting with him.

Q. 9.—You kept a professional diary during the period from 1915 to 1920 and thereafter? A.—Yes.

Q. 10.—I show you a volume containing handwritten entries, and ask you whether that is your diary. A.—That is my diary for 1914.

Q. 11.—Does it not go on to 1915 and 1916? A.—Yes.

Q. 12.—Let me call your attention, Mr. Williams, to an entry dated February 24, 1915, and ask you whether that entry is in
20 your handwriting? A.—Yes, it is in my handwriting.

BY MR. COHEN: Is it agreeable if I read, Mr. Smart?

BY MR. SMART: Yes; anything to shorten it.

Q. 13.—The entry reads:

“February 24, 1915:
Minerals Separation Ltd.
Met Mr. Martin at Dr. Gregory’s office.
Also Dr. Gregory, Dr. Liebmann,
Mr. Higgins, and Mr. Salinger.”

30 What does that entry indicate to you, Mr. Williams? A.—It indicates that it was my first meeting with Martin, and that I talked with him and Mr. Salinger. I was also engaged in preparations for the trial of Minerals Separation against Miami Copper Company, which went on from then for the next three months.

Q. 14.—Who was Mr. Higgins? A.—Mr. Higgins was the technical man of Minerals Separation, Limited.

Q. 15.—Who was Dr. Liebmann? A.—Dr. Liebmann was the expert in the patent litigation.

Q. 16.—Who was the president of the Minerals Separation at that time, Mr. Williams? A.—Mr. John Ballot occupied the position which corresponded to the president.
40

Q. 17.—Chairman — ? A.—He was chairman of the board of directors.

BY MR. COHEN: I will state for the record that Mr. Ballot was chairman of Minerals Separation, Limited, and president of Minerals Separation American Syndicate (1913) Limited.

For Plaintiff—H. D. Williams—Direct

Q. 18.—Did you meet Mr. Ballot on that date, February 24th?
A.—I am quite sure I did. He introduced me to Mr. Martin.

Q. 19.—Did he mention to you some discussions which he had had with Mr. Martin? A.—Yes. He mentioned the fact that he had agreed with Mr. Martin as to an employment agreement and the purchase of certain inventions of Mr. Martin's.

Q. 20.—Did you thereafter draw two agreements to each of which Mr. Martin was a party and to one of which Minerals Separation, Limited was a party and to the other of which Minerals
10 Separation American Syndicate (1913) Limited was a party?
A.—Yes, I drew those two agreements.

Q. 21.—Now, the former of those two agreements was an option agreement, was it not? A.—Yes.

Q. 22.—And the latter of those two agreements was an employment agreement, was it not? A.—Yes.

Q. 23.—I show you two documents, and ask you if you can identify them as the contracts drawn by you. A.—Yes, these are the two agreements in question.

BY MR. SMART: This is a photostat.

20 BY MR. COHEN: This is a photostat. The original I will be very glad to obtain—

BY MR. SMART: I will accept the photostat.

BY MR. COHEN: I offer as Exhibit 1 for the Plaintiff the agreement made March 6, 1915, between Minerals Separation, Limited, and Rutherford B. Martin; and as Exhibit 2 for Plaintiff the agreement March 6, 1915, between Minerals Separation American Syndicate (1913) Limited and Rutherford B. Martin.

BY MR. COHEN: Mr. Smart, is it agreeable to you if I substitute copies?

30 BY MR. SMART: It is not necessary to return the originals. As long as you keep the originals available, I agree to photostats.

BY MR. COHEN: Then I will use copies.

(Exhibits 1 and 2 for Plaintiff marked by the commissioner.)

Q. 24.—These agreements, Mr. Williams, are dated March 6, 1915; did you meet Mr. Martin on that day? A.—Yes.

Q. 25.—Where did you meet him? Let me call your attention to the fact, Mr. Williams, that the notary public who took the acknowledgements of those instruments was a man named Harry C. Lewis. A.—He was in my employ. He has since passed away.

40 Q. 26.—Does that indicate to you that Martin was at your office to sign the agreements? A.—Yes.

Q. 27.—Is it your impression that Dr. Gregory signed the agreements at your office, as well? A.—I don't think he signed them at my office. I think he signed them at his office and sent them to me.

For Plaintiff—H. D. Williams—Direct

Q. 28.—And then you had Mr. Martin sign them; is that correct? A.—Yes.

Q. 29.—Did you have any instructions from Dr. Gregory with respect to your dealings with Martin? A.—Yes.

Q. 30.—From Dr. Gregory, Mr. Williams? A.—The agreement was largely drawn under instructions from Mr. Ballot.

Q. 31.—Did you have any instructions from Dr. Gregory in that matter? A.—I don't think I did. Mr. Ballot was quite accustomed to directing all things, and he had charge of the matter.

10 Q. 32.—What was Dr. Gregory's function in the organization, if you know? A.—He was in charge of the litigation.

Q. 33.—Did he have anything to do with the technical matters?

BY MR. SMART: I don't think this witness is qualified—We are going to put Dr. Gregory on tomorrow.

BY MR. COHEN: This afternoon, I hope. This witness, after all, is patent counsel for the company and intimately familiar with its affairs. A.—Yes.

20 Q. 34.—Did Mr. Ballot give you any instructions with respect to obtaining disclosures from Mr. Martin? A.—Yes. He instructed me to obtain a full disclosure of all inventions that Martin brought with him.

Q. 35.—Did you attempt to do so, Mr. Williams? A.—I did.

Q. 36.—When? A.—The diary, I think, will fix the time.

Q. 37.—I show you an entry from your diary dated March 6, 1915, and ask you whether that is the entry to which you have reference. It reads:

“March 5 and 6. Minerals Separation Ltd.

Drawing Martin contracts. 4/5 day.”

A.—Yes.

30 Q. 38.—Now, was it on that day you attempted to get a disclosure from Mr. Martin of his inventions? A.—I think so, yes.

Q. 39.—Was anyone else present at the time when you talked with him? A.—Mr. Higgins was present.

Q. 40.—Did you make notes? A.—I made notes of the disclosures—very full notes; and I held Mr. Martin down in his conversation so that I could take it down in longhand.

Q. 41.—I show you two yellow sheets of paper, Mr. Williams; and ask you whether those are the notes which you made on that day. A.—Yes, those are the notes I made on that day.

40 BY MR. COHEN: I offer the two sheets of paper as Exhibit 3 for the Plaintiff.

(Exhibit 3 for Plaintiff marked by the commissioner.)

Q. 42.—Mr. Williams, I will read it to you and ask you about it.

A.—Yes.

For Plaintiff—H. D. Williams—Direct

Q. 43.—The disclosure in which we are interested now is Natrola. This reads: “is organic sulphide.” Did Martin tell you that? A.—Yes.

Q. 44.—It reads further: “From alcohol or starch in presence of carbon bisulphide.” Did Martin mention starch, to your recollection? A.—Yes.

Q. 45.—It reads: “Gives froth and floats without oil.” Martin told you that, didn’t he? A.—Yes, yes.

Q. 46.—“Can be made from molasses”; is that something
10 Martin told you? A.—Yes.

Q. 47.—“100 cc. alcohol (not absolute, but cheap, containing water)”; is that something else Martin told you? A.—Yes.

Q. 48.—“Works well with Hydrula”; that you wrote from something Martin said, is that correct? A.—Yes.

Q. 49.—I notice here in the lower righthand corner, “Thiocarbonate”; have you any recollection of what Martin said to you which caused you to write that word down? A.—He said the word “thiocarbonate.”

Q. 50.—Over on the next page, Mr. Williams, you have written:
20 “Or molasses replaces alcohol.” That was written following a disclosure made by Martin, was it not? A.—Yes.

BY MR. SMART: You didn’t examine him about those three things; you left out—

BY MR. COHEN: Yes, I left out—

Q. 51.—Mr. Williams, there is also written down:

“25 cc. carbon bisulphide
“ 5 grams NaOH”;

Mr. Martin mentioned that to you as well, did he not? A.—Yes.

Q. 52.—Now, I take it that the balance of the writing on the
30 second page, containing the formula, has no relation to Natrola, but to some other disclosure, regarding some other substance; is that correct? A.—Yes.

Q. 53.—Mr. Williams, have you ever compared your notes of that conference with the notes made by Mr. Higgins? A.—Yes; he found them afterward, and they compared with mine very closely—just the difference between the expert metallurgist and the lawyer.

Q. 54.—Did you ask Martin to tell you everything he could about his inventions? A.—Yes.

Q. 55.—Was there any discussion at that conference about a
40 laboratory in Long Island City where Martin was to demonstrate his inventions? A.—I think so, yes.

Q. 56.—Do you remember that the arrangements were that Martin was himself to select a laboratory at which he was to conduct experiments in the presence of Mr. Higgins? A.—Yes.

For Plaintiff—H. D. Williams—Direct

Q. 57.—And that was arranged at that conference, was it not?
A.—Yes; and he was given full freedom to work on his inventions and nothing else.

Q. 58.—What was your next connection with this Martin matter, Mr. Williams? A.—My next connection with it was to prepare certain patent applications.

Q. 59.—Isn't it true that you left immediately following this conference for the trial of a case in Wilmington? A.—Yes.

Q. 60.—When you came back from Wilmington, did you find
10 in your office a copy of certain patent specifications purporting to have been sent by Martin to Dr. Gregory? A.—Yes.

Q. 61.—I show you certain documents and a covering letter, both being originals, and ask you whether you were handed either the originals or copies of those documents. A.—I was handed probably copies of these documents,—the originals.

Q. 62.—You will note the handwriting of Martin is on some of the specifications? A.—Yes.

BY MR. COHEN: I offer the covering letter, dated March 19, 1915, from Rutherford B. Martin to Dr. S. Gregory as Exhibit 4
20 of the Plaintiff. (So marked.) I next offer the enclosed patent specifications, containing specifications for Kotrix, Stanol, Grabanol, Minola, Aranol, Cinol, and Pyrox, and also an unnamed patent specification, as Exhibit 5 of the Plaintiff.

(Exhibit 5 for Plaintiff marked by the commissioner.)

Q. 63.—Mr. Williams, the trial of the case in Wilmington lasted a considerable length of time, did it not? A.—Yes; about three months,—my stay there.

Q. 64.—You came back——? A.—I came back about May 30th.

Q. 65.—Do you remember then having a discussion with Mr.
30 Higgins about these patent specifications? A.—Yes.

Q. 66.—What was that discussion? A.—I said they were hopeless in their disclosures; impossible to understand what he had in mind; and that, as a basis for patent specifications, they were hopeless.

Q. 67.—Did you conclude to take any action at that time? A.—Mr. Higgins prepared two specifications based upon two of the disclosures, but not following these specifications at all.

Q. 68.—At that, I think, Mr. Williams, we will find that Mr.
40 Higgins' specification were prepared considerably later in the year—sometime in November or December. We are talking now about June or July. At that time it was concluded, was it not—

BY MR. SMART: Don't lead him too strenuously.

Q. 69.—The laboratory was then set up, Mr. Williams? A.—Yes.

For Plaintiff—H. D. Williams—Direct

Q. 70.—Do you remember what your decision was after that discussion? A.—I told Mr. Higgins to have the inventions tested out in the laboratories and prepare specifications for those that were of value.

Q. 71.—Now, there will be in evidence in the course of this case a document entitled “Bulletin No. 2,” submitted by Martin to Minerals Separation.—

BY MR. SMART: If it will save any trouble, I'd like to make a statement.

10 BY MR. COHEN: No, I think Mr. Williams understands and appreciates the nature of the document.

BY MR. SMART: No; you say it is going to be in evidence. It ought to be in evidence if you state what it is.

BY MR. COHEN: I haven't a copy here. I don't propose to offer it, Mr. Smart.

BY MR. SMART: I want a copy of that here.

BY MR. COHEN: Well, we have it over at Minerals Separation's office.

(Question continued):—Mr. Williams, did you ever see a copy of
20 Martin's Bulletin No. 2? A.—I saw it a long time after it was written.

Q. 72.—When was the first time you saw a copy of it? A.—(No answer)

Q. 73.—Mr. Williams, do you remember that you represented Minerals Separation in the trial of an interference proceeding between Keller and Martin? A.—Yes.

Q. 74.—Do you remember that in the course of that proceeding it became relevant for you to have some experiments done on certain mixtures indicated in Bulletin No.2? A.—Yes.

30 Q. 75.—Do you remember sending a wire to San Francisco, asking that those experiments be done? A.—Yes.

Q. 76.—I show you a telegram and ask you if that is the original of the telegram you sent? A.—Yes.

BY MR. COHEN: I offer as Exhibit 6 for the Plaintiff this telegram dated November 13, 1929, from Henry D. Williams to Edward H. Nutter.

(Exhibit 6 for Plaintiff marked by the commissioner.)

Q. 77.—Did you receive a reply from Nutter to that telegram?
A.—Yes.

40 Q. 78.—I show you a telegram and ask you if that is the telegram you received. A.—This is the answer of Mr. Nutter to the telegram. Mr. Nutter was the chief engineer in charge of the San Francisco laboratory of Minerals Separation, Limited and Minerals Separation American Syndicate (1913) Limited.

For Plaintiff—H. D. Williams—Direct

BY MR COHEN: Offer as Exhibit 7 for Plaintiff this telegram from E. H. Nutter to H. D. Williams, dated November 14, 1929.

(Exhibit 7 for Plaintiff marked by the commissioner.)

Q. 79.—Now, Mr. Williams, how long before that was the first time that you saw that Bulletin No. 2? A.—(No answer)

Q. 80.—Do you remember that Martin came to see you shortly before he left his employment? A.—Yes.

Q. 81.—And there was a discussion, was there not, with respect to certain claims advanced by Martin? A.—Yes.

10 Q. 82.—And did you not call for all the relevant records of his work after that discussion? A.—Yes; and I presume then I saw Bulletin No. 2 for the first time.

Q. 83.—You don't remember ever seeing it until that discussion? A.—No.

Q. 84.—Now, I want to show you, Mr. Williams, another entry from your diary, dated August 12, 1915, during the summer when Martin was working in the laboratory. A.—Yes.

Q. 85.—That entry reads:

20 “August 12: Minerals Separation Ltd.
Conference with Mr. Higgins as to
various applications, including
Martin. 4/5 day.”

A.—Yes.

Q. 86.—Does that refresh your recollection that you discussed the possibility of filing applications covering Martin's disclosures with Mr. Higgins during that summer? A.—Yes.

30 Q. 87.—I think you said before that subsequently Mr. Higgins himself drafted patent specifications on two of Martin's inventions and submitted them to you; is that correct? A.—Yes, [they being the only two that had shown any promise of utility in the results of the laboratory experiments of Martin.]

Q. 88.—Did you have a discussion with Mr. Higgins on that subject? A.—Yes.

Q. 89.—And it was following that discussion that he submitted the two drafts to you? A.—Yes.

Q. 90.—Did you ask him whether there was anything else of value other than those two inventions upon which patents were applied for? A.—I certainly did, and he replied there was nothing else of value.

40 Q. 91.—I show you another diary entry,—January 7, 1916; and another entry,—January 14, 1916; and I will read them to you. The first one:

“Minerals Separation Ltd.:
Applications and conference with
Mr. Higgins as to them. Study
of same. 1 day.”;

For Plaintiff—H. D. Williams—Direct

and on one of January 14th:

“Minerals Separation Ltd.:
Martin applications. 2/5 day.”

Does that refresh your recollection,—those entries,—that in January, 1916, you personally prepared the patent applications on Martin’s inventions? A.—Yes, on draft prepared by Mr. Higgins.

Q. 92.—And you used Mr. Higgins’ draft to complete your own draft? A.—Yes.

Q. 93.—Do you remember that Mr. Martin came to your office
10 to sign the patent applications as drafted by you? A.—Yes.

Q. 94.—Did you have a discussion with him with respect to the patents that were being applied for? A.—Yes.

Q. 95.—What was that discussion? A.—I asked him whether or not these two applications included everything of value that he had brought with him from Utah Copper Company; and he replied that they did.

Q. 96.—Did there subsequently come a time when Minerals Separation exercised its option to purchase Martin’s inventions?
A.—Yes.

20 Q. 97.—I show you a letter from Martin to Dr. Gregory, dated February 23, 1917, and ask you whether this letter was not forwarded to you. A.—I remember it very distinctly.

BY MR. COHEN: I offer in evidence as Exhibit 8 for Plaintiff this letter from R. B. Martin to Dr. Gregory, dated February 23, 1917.

(Exhibit 8 for Plaintiff marked by the commissioner.)

Q. 98.—Were two patents subsequently applied for and issued on the basis of Martin’s disclosures? A.—Yes.

30 BY MR. COHEN: I offer in evidence as Exhibit 9 for Plaintiff United States patent No. 1,236,856 to Rutherford B. Martin, filed January 28, 1916, and patented August 14, 1917; and as Exhibit 10 for Plaintiff United States patent No. 1,236,857 to Rutherford B. Martin, filed January 28, 1916, and patented August 14, 1917.

(Exhibits 9 and 10 for Plaintiff marked by the commissioner.)

40 Q. 99.—And I ask you whether those are the patents the specifications of which you drew as a result of your discussions with Mr. Higgins and Mr. Martin. A.—Yes, these are the patents. [They represent all that Martin had succeeded in demonstrating to be of any value of the inventions brought to Minerals Separation from Utah Copper Company.]

Q. 100.—Did you, after receiving the letter of February 23, 1917, which is Exhibit 8, have a conference with Martin? A.—Yes, I had a conference with Martin, and asked him whether or not we had prepared applications for all the inventions of his which were of any value. He said yes.

For Plaintiff—H. D. Williams—Direct

Q. 101. You felt, did you not, that the responsibility of getting everything for which Minerals Separation was paying was upon you?

A.—I certainly did.

Q. 102.—And, for this reason, you yourself had this conference with Mr. Martin? A.—Yes.

Q. 103.—And did you again have a conference with Mr. Higgins to make sure? A.—Yes.

Q. 104.—Did you write a letter to Minerals Separation, asking for the \$5,000 contracted for in the agreement of March 6, 1915?

10 A. —I did.

Q. 105.—I show you a copy of a letter—

BY MR. COHEN: The original has disappeared, Mr. Smart.

(Question continued):—And I ask you if that is the letter you sent. A. Yes, on March 21, 1917. I felt very strongly that the responsibility was upon me to determine that all patent applications had been filed for all inventions disclosed by Mr. Martin of any value.

BY MR. COHEN: I offer as Exhibit 11 for Plaintiff this letter of Henry D. Williams to Minerals Separation North American Corporation, dated March 21, 1917.

20 (Exhibit 11 for Plaintiff marked by the commissioner.)

Q. 106.—Did you procure a receipt from Martin for the \$5,000?

A.—Yes. I drew the receipt.

Q. 107.—Have you had a search made for the original of that receipt? A.—Yes.

Q. 108.—It was unsuccessful? A.—Unsuccessful.

Q. 109.—I show a photostat of your file copy of that receipt and ask you whether that is the receipt that you drew. A.—Yes.

Q. 110.—Do you know whether Martin signed the copy of that receipt? A.—Yes.

30 BY MR. COHEN: I offer the photostat of that document in evidence as Exhibit 12 for Plaintiff.

(Exhibit 12 for Plaintiff marked by commissioner.)

Q. 111.—Did you personally hand to Martin this check for \$5,000, or was that done over at the Minerals Separation office?

A.—That was done at the Minerals Separation office.

Q. 112.—Mr. Williams, have you compiled a list of the patent applications applied for on the basis of the work done by Martin during his employment by the Minerals Separation companies? A.—Yes.

40 Q. 113.—I show you a list and ask you whether that is the list that you made. A.—That is the list I made, including all the inventions of Martin made before or during his employment by Minerals Separation, Limited.

Q. 114.—That shows eleven applications, does it not? A.—Yes, eleven applications.

For Plaintiff—H. D. Williams—Direct

Q. 115.—Of which five? A.—Of which five became patents and the others were abandoned as unpatentable.

BY MR. COHEN: I offer that list in evidence as Exhibit 13 for Plaintiff (Exhibit 13 for Plaintiff marked by the commissioner.)

Q. 116.—Mr. Williams, I show you a letter, dated March 30, 1923, from Edward H. Nutter to Minerals Separation North American Corporation, enclosing a rather elaborate report, dated March 28, 1923, to Mr. Nutter and signed by Mr. Lewis and Mr. Keller; and ask you whether you received those documents on or about the date they bear. A.—Yes; I received them when they arrived in New York from San Francisco.

Q. 117.—Did you examine them? A.—I examined them very carefully.

Q. 118.—Did your office set about the preparation of a patent application on the basis of them? A.—Yes; the matter was put in the hands of Mr.—

Q. 119.—Was it Mr. Thomas? A.—Edward Thomas, who was my assistant at that time.

BY MR. COHEN: I offer the letter of March 30, 1923, as Exhibit 14 for Plaintiff, and the report of March 28, 1923, as Exhibit 15 for Plaintiff. (Exhibits 14 and 15 for Plaintiff marked by the commissioner.)

(Witness continues): I would say that, when I read that, I think that was the first time I became acquainted with the word “xanthate”.

Q. 120.—You had never heard the word “xanthate” before? A.—I had never heard the word “xanthate” before. I am very keen on chemical terms, and for the first time “xanthate” and “xanthogenate” were brought to my attention.

Q. 121.—Had Mr. Higgins ever mentioned that word to you? A.—No.

Q. 122.—Had Martin ever mentioned that word to you? A.—No, he never mentioned it to me.

Q. 123.—I show you a letter written on the stationery of your office, then Williams & Pritchard, dated April 30, 1923, and addressed to Minerals Separation North American Corporation, New York; and ask you if you recognize that letter. A.—Yes. Signed by Mr. Thomas, I think.

BY MR. COHEN: I offer the letter as Exhibit 16 for Plaintiff. (Exhibit 16 for Plaintiff marked by commissioner.)

Q. 124.—Did you have a discussion with Mr. Martin sometime in January, 1926? A.—Yes.

Q. 125.—Do you remember the circumstances? A.—I had written to someone representing the Utah Copper Company, inquiring about certain work that Martin said he had done with the Utah Copper Company on the subject of mercaptan I think.

For Plaintiff—H. D. Williams—Direct

Q. 126.—Mr. Williams, didn't that information about mercaptan come to you in a report from a field representative of Minerals Separation? A.—Yes.

Q. 127.—Did you send for Martin as a result of that report? A.—Yes.

Q. 128.—And you had a discussion with him? A.—Yes; and during the discussion I produced my file of the disclosures that he made at the time he came with the company and showed it to him. Thereupon he suddenly claimed that he was the inventor of the
10 xanthates as used in flotation. I replied that he had not disclosed that to me or Mr. Higgins and that he had abandoned what he did disclose to us, so that he had no further claim to inventorship. I have no doubt that that was what started him in his claims of inventorship,—the fact that I had a record of his disclosures.

Q. 129.—Your records, Mr. Williams, consisted of the contracts——? A.—The contracts and the memorandum of disclosures which he made.

Q. 130.—Yes; his patent specifications as well? A.—His patent specifications as well, yes.

20 Q. 131.—Those are Exhibits 1 and 2, 3 and 5? A.—Yes.

Q. 132.—Had you ever heard, before that conference in January, 1926, any claim that stanol or natrola were related to xanthate? A.—I had not; xanthate had not been mentioned.

Q. 133.—Mr. Williams, did Minerals Separation make a practice of sending to you the bulletins which Martin produced in the course of his employment with Minerals Separation? A.—No.

Q. 134.—Which ones did they send you? A.—Only those that were necessary for the purpose of preparing patent applications.

30 Q. 135.—Did you ever see Bulletins 3, 4, and 5? A.—I don't know that I ever did.

Q. 136.—I want to turn your attention now to a different subject,—your participation in the action brought by the Metals Recovery Company against Anaconda Copper Company. A.—Yes.

Q. 137.—You originally appeared as one of the counsel for the defendants in that case? A.—Yes; I undertook the defense of the case and prepared for trial.

Q. 138.—Did you draft the answer? A.—I drafted the answer and filed it; with Mr. Wm. Houston Kenyon, I prepared the trial of the case.

40 Q. 139.—Did you, sometime in the summer of 1926, receive a letter advising you that counsel for Anaconda thought it advisable to plead as one of the defenses that Martin was the discoverer of the use of xanthate in flotation? A.—That was the first disclosure made by Mr. Evans when I was in Salt Lake City.—

For Plaintiff—H. D. Williams—Direct

Q. 140.—Mr. Evans was counsel for Anaconda? A.—Mr. Evans was counsel for Anaconda. And I told him there was nothing to it, that he had not disclosed that invention to me; that what he had disclosed was abandoned. But Mr. Evans seemed to think that counsel for the Anaconda Copper Company was determined to make that defense.

Q. 141.—Did you thereupon send Mr. Evans a telegram? A.—When I got back to New York—I cut short my vacation and came to New York at once and communicated with Mr. —

10 BY MR. COHEN: Neave?

(Witness continues):—Mr. Charles Neave, who was counsel for the Anaconda Company, and gave him a chance to amend the answer within thirty days of the trial. I told him that Martin had made certain disclosures to us which did not involve the use of xanthates, and that all that he had disclosed was worthless and abandoned by him as well as by us. But Mr. Neave seemed to think that he had a case, and said he was going to set up as the defense Martin's invention. Thereupon I said to him, if he did that, I would withdraw from the case and Mr. Wm. Houston Kenyon would also with-
20 draw from the case. We left it that way, and I thereupon communicated with Mr. Evans.—

Q. 142.—I show you a telegram, dated August 20, 1926, from you to Mr. Evans, and ask you if that is a copy of the telegram you sent A.—Yes.

BY MR. COHEN: I offer the telegram as Exhibit 17 for Plaintiff.

(Exhibit 17 for Plaintiff marked by the commissioner.)

(Witness continues): I had prepared up to that point to defend the case, representing Minerals Separation.

Q. 143.—Minerals Separation, under its agreement with Ana-
30 conda, had the privilege of assuming the defense, did it not? A.—Yes.

Q. 144.—Did you on the same day, August 20, 1926, send a letter to counsel for plaintiff in the Metals Recovery suit, advising them that you would withdraw? A.—Yes.

Q. 145.—I show you a letter dated the same day, August 20, 1926, and ask you if that is a copy of the letter which you sent. A.—Yes.

BY MR. COHEN: I offer this letter as Exhibit 18 for Plaintiff.

(Plaintiff's Exhibit 18 marked by the commissioner.)

40 Q. 146.—I should like to turn to another subject now, Mr. Williams. Do you remember, in 1920, being consulted by Mr. Ballot about a man named Luckenbach? A.—Yes

Q. 147.—Do you remember receiving a letter from Mr. Ballot, asking your professional opinion with respect to certain of his patents? A.—Yes.

For Plaintiff—H. D. Williams—Direct

Q. 148.—I show you a letter and ask you whether that is the letter. A.—That's the letter.

BY MR. COHEN: I offer, as Exhibit 19 for Plaintiff, this letter from John Ballot to Henry D. Williams, dated September 20, 1920.

(Exhibit 19 for Plaintiff marked by the commissioner.)

Q. 149.—Did you render to Minerals Separation North American Corporation an opinion in response to that letter? A.—Yes.

Q. 150.—I show you your file copy and ask you if you can identify it. A.—Yes; that's the file copy of the letter I wrote to
10 Minerals Separation North American Corporation, giving my opinion as to the patents of Luckenbach.

BY MR. COHEN: I offer, as Exhibit 20 for Plaintiff, this letter from Henry D. Williams to Minerals Separation North American Corporation, dated December 2, 1920). (Exhibit 20 for Plaintiff marked by the commissioner.)

Q. 151.—I should like, Mr. Williams, to mark in evidence your file copy of the file wrapper of the application on behalf of Cornelius H. Keller for a patent, which ripened into patent No. 1,554,216; I will ask you to identify the folder as your office copy of the file
20 wrapper. A.—Yes. It has the letters of the Patent Office in it. The application was originally filed by Keller and Lewis, and we decided later that Lewis had participated only in the use of alkaline circuits, and we prepared amendments in connection with his withdrawal from the case and the preparation of a separate application. At the time of the filing of the application for Keller, this patent was held up by an interference with an application of Sayre. This interference grew out of the work that was done by Anaconda, and we put in our testimony in the case. Thereupon defendant's counsel notified me that he had only instituted the case for the purpose of
30 getting our testimony, and that he would withdraw from the case.

Q. 152.—This was the Sayre interference? A.—The Sayre interference.

BY MR. COHEN: I will offer, as Exhibit 21 for Plaintiff, that file in one folder, entitled:

“Application of CORNELIUS R. KELLER (and CARL PIERCE LEWIS) Serial No. 670,242, filed Oct. 23, 1923. FROTH FLOTATION CONCENTRATION OF ORES

“Which Resulted in the issuance of patent to CORNELIUS H. KELLER No. 1,554,216 dated September 22, 1925.”
40 (Exhibit 21 for Plaintiff marked by commissioner.)

BY MR. COHEN: That is all.

For Plaintiff—H. D. Williams—Cross-Examination

CROSS-EXAMINATION BY MR. SMART

XQ. 153.—Mr. Williams, these diaries of yours, I would take it, were the means you had of keeping track of what professional work you did for your clients? A.—Yes.

XQ. 154.—And it was from them you made your charges to your client for such professional work? A.—Yes.

XQ. 155.—So that we may expect to find in these diaries substantially all the professional work you did for your client? A.—Yes.

10 XQ. 156.—Now, will you tell me when you yourself first saw the letter and patent specifications which are Exhibits 4 and 5? I think it was after you were away to the trial at Wilmington, but the date wasn't given very definitely. A.—I think that I returned to my office about May 27th and found this letter on my desk.

XQ. 157.—May 27th? A.—Yes.

XQ. 158.—I take it you studied these documents at that time rather carefully? A.—I studied them very carefully.

XQ. 159.—Paragraph by paragraph? A.—Yes.

20 XQ. 160.—Is there any entry in your diary of time spent in studying those specifications? A.—I don't know as to that.

XQ. 161.—Well, you might look over the diary here. A.—There is no record directly relating to Martin's work at that time.

XQ. 162.—Thank you. Now, to clear that up: I think there is no entry until the entry you referred to of August 12th; is that right? A.—Yes, I guess so.

XQ. 163.—Now, will you look at Exhibit 4. A.—Yes.

30 XQ. 164.—The first compound that is mentioned there is kotrix; and I gather from the specification, Exhibit 5, that that is a compound made from calcium hydrate or oxide, sulphur, calcium carbonate, and sodium hydrate. A.—Yes, that's the preparation.

XQ. 165. And that compound, kotrix, is one of those which became the subject of a patent? A.—It never became the subject of a patent. It was not considered of any value and, therefore, it was not patented.

XQ. 166.—It was, however, used from time to time during the period of Martin's employment? A.—Yes, it was tried on several occasions and always failed.

XQ. 167.—Well, you have seen the tests of a number of uses of that? A.—I saw the bulletin of Mr. Martin, wherein he said he had tried it with aranol and it failed.

40 BY MR. COHEN: I think Mr. Williams thinks you are talking about the stanol application and not the kotrix application.

XQ. 168.—Yes, I am talking about the kotrix application, Mr. Williams; do you want to change your answer any? A.—Kotrix was the subject of an application.

For Plaintiff—H. D. Williams—Cross-Examination

BY MR. COHEN: Yes, Kotrix was patented.

(Witness continues): What have I said about it?

XQ. 169.—You said it wasn't patented. Now you are correcting your answer. It was patented and some use made of it from time to time? A.—Yes.

XQ. 170.—Now, the name "stanol" there was what I would call a fancy name adopted by Martin to identify that product; is that right? A.—Yes.

XQ. 171.—And that was the same product that was previously
10 referred to as "natrola" when Martin was with Utah Copper Company? A.—Yes.

XQ. 172.—Now, will you turn to Exhibit 5. Tell me: was there a file made for these disclosures of Martin in your office? A.—There was a file for the whole subject of Martin's disclosures and Martin's contracts.

XQ. 173.—What was that file entitled? A.—I don't remember exactly what its entitlement was.

XQ. 174.—Will you produce that file? A.—I will endeavor to do so.

20 BY THE WITNESS (to Mr. Cohen): Have you got that file?

BY MR. COHEN: I can tell you what happened. I broke it up for the purpose of producing the documents. Mr. Williams gave the file to me.

BY MR. SMART: Will you let me see the file?

BY MR. COHEN: The document in his hand may be one of them.

BY MR. SMART: No, I am asking about the file.

BY MR. COHEN: You mean the envelope?

BY MR. SMART: Yes.

BY MR. COHEN: I don't have it.

30 XQ. 175.—Mr. Cohen says he broke it up. Now, when was it broken up? A.—Probably recently.

BY MR. SMART: I ask counsel for plaintiff to produce the file.

BY MR. WILLIAMS: We will produce it if it can be found.

BY MR. COHEN: Do I understand you clearly, Mr. Smart? What you want us to produce is the wrapper in which the documents in Mr. Williams' possession, relating to Martin, were kept?

BY MR. SMART: Yes.

40 BY MR. COHEN: I doubt if we retained that. I will make a search for it. Mr. Williams has already testified as to the documents that were in that file.

BY MR. SMART: I am entitled to see the file to see if there are any other documents in it.

For Plaintiff—H. D. Williams—Cross-Examination

BY MR. COHEN: If we have it. I understood you were just looking for the wrapper, not what was in it.

BY MR. SMART: If I get the wrapper, I may be able to find out what was in it. Perhaps we can leave that for the noon adjournment.

BY MR. COHEN: Yes; we are going over to Minerals Separation, where the papers are. I can say now I am doubtful if we will find it.

XQ. 176.—And what did you put in that file, Mr. Williams? A.—Specifications sent to me by Martin—sent to Minerals Separation by Mr. Martin; copies of the agreements drawn; and all documents
10 relating hereto.

XQ. 177.—I suppose that would include any notes you made yourself on the subject-matter of the documents in the file? A.—Yes, it included my notes that are in evidence here.

XQ. 178.—Yes; and any other notes? A.—I don't know of any other notes.

XQ. 179.—When you studied these documents, did you make some notes about them? A.—I don't think I did, no.

XQ. 180.—You don't know? A.—I don't think I did. The documents were so vague in their disclosures, it was very difficult to
20 understand what he had in mind.

XQ. 181.—Now, how much time do you estimate you spent in studying the documents, Exhibit 5? A.—I read them over, failed to understand them, and then took them up with Mr. Higgins.

XQ. 182.—I mean, in your private study, apart from the time you spent with Mr. Higgins, how many hours would you estimate you spent studying these five specifications? A.—Not more than an
30 hour or two.

XQ. 183.—Altogether? A.—Altogether, yes.

XQ. 184.—And I think, instead of five, there are really six specifications there, are there not, in Exhibit 5? A.—Yes.

XQ. 185.—So that, so far as your evidence that you have given this or any other case is concerned, it is based on a study of that length of time of these documents, Exhibit 5? A.—Yes.

XQ. 186.—Now, will you look at the one entitled "Stanol". A.—Yes.

XQ. 187.—I will read the last paragraph on the first page, which
40 reads:

"In preparing the alkali organic sulphide, I prefer the employment of sodium hydrate as the alkali, and alcohol and water as the organic base, and carbon disulphide as the organic sulphide, though in practice it is feasible to employ other analogous combinations to effect the same result."

Did you have any difficulty in understanding that paragraph? A.—That was a statement that certain substances might be used in the preparation of it and that other substances could be substituted for it.

For Plaintiff—H. D. Williams—Cross-Examination

XQ. 188.—Well, now, there are three substances mentioned, are there not: sodium hydrate,—that you were quite familiar with? A.—Yes.

XQ. 189.—And water and alcohol you were quite familiar with? A.—Yes.

XQ. 190.—And carbon disulphide? A.—Yes.

XQ. 191.—And, in a general description of the combination of chemical substances, in the absence of other instructions, would you not understand that they were to be used in molecular proportions?
 10 A.—Well, no formula being given, it was hard to determine just what the molecular proportions would be.

XQ. 192.—If the reaction of those substances were already known and you were told to employ three substances, you would expect to employ them in molecular proportions? A.—That would be a reasonable interpretation of the disclosure, but the absence of formula gives you no indication of the number of molecules of each constituent.

XQ. 193.—No, but what I am putting to you is that, if you were told to make a compound by combining three chemical ingredients which are capable of combining, you would as a chemist employ them in
 20 molecular proportions in the absence of other instructions? A.—The difficulty is that you do not specify the number of molecules present either in the compound or in the constituents; therefore, you could not determine the molecular proportions.

XQ. 194.—Well, a chemist would write out the equation, would he not, that would be expected to follow by combining the compound? A.—The chemist might know that if the proportions were given in the formula for the reaction; then the molecular proportions could be readily determined.

XQ. 195.—You don't suggest that that paragraph would not be
 30 sufficient instructions to a chemist to prepare a compound formed by the reaction of sodium hydrate, alcohol, and carbon disulphate?

BY MR. COHEN: I object to that question, on the ground that Mr. Williams is not a chemist. He is patent counsel for the company. I do not object to elementary chemical problems, with which, of course, Mr. Williams is familiar. But any question beyond the scope of a patent lawyer should be asked of experts, and not of patent lawyers. A.—I do. It lacks the proportions of the various chemicals.

XQ. 196.—I am suggesting to you that a chemist told to combine
 40 three ingredients such as there named would use the molecular proportions that you would find from the known equation of their reaction; is that not so?

BY MR. COHEN: I think that question has been asked and answered twice to the best of Mr. Williams' knowledge. A.—The document itself mentions the presence of other substances.

XQ. 197.—Well, I am confining my attention at the moment to this paragraph. Now, it was known at 1915, was it not, that a mixture

For Plaintiff—H. D. Williams—Cross-Examination

of sodium hydrate, alcohol, and carbon disulphide in proper proportions would produce a xanthate? A.—I do not know that that is a fact.

XQ. 198.—It was in the textbooks earlier than that date, was it not? A.—I don't know of that.

XQ. 199.—You don't know now of that, Mr. Williams? A.—No.

XQ. 200.—Well, that fact appears in the record in this Metals Recovery case that was referred to. A.—I don't know that it did.

XQ. 201.—I will refresh your mind on that. —

10 BY MR. COHEN: Mr. Williams testified he took no part in that case, Mr. Smart.

BY MR. SMART: I could suspect he has read the record.

BY THE WITNESS: I haven't read the record in that case: I only referred to it a little bit. (Question continued): I will show you page 641 of Volume II of the record in Metals Recovery Company vs. Anaconda Copper Mining Company, where is reproduced pages 390 and 391 of Richter's "Organic Chemistry." It is clear from that, is it not, that the reaction that would take place when these substances were put together was already well known? A.—Yes, I guess so.

20 XQ. 202.—And, if you had that information from Richter before you at the time you read this paragraph, it would have meant more to you? A.—It didn't follow that the man who wrote the paragraph knew what would happen.

XQ. 203.—I wasn't just asking that; I was asking whether, had that information been before you, this paragraph at the end of the first page of the specification of stanol would have meant more to you when you read it. A.—I can only read it in connection with the specification as a whole.

30 XQ. 204.—Anyway, it didn't attract your attention at the time? A.—It was a part of the specification, which insisted on the presence of other substances as essential to the operation.

XQ. 205.—The document, of course, speaks for itself; but is not this paragraph a definite direction as to how what is termed the "alkali organic sulphide" was to be prepared? A.—It lacks definiteness.

XQ. 206.—The purpose of the compound, as disclosed here and in the discussion, was to promote flotation in the usual flotation process, was it not? A.—To produce and promote flotation.

XQ. 207.—To produce and promote flotation? A.—Yes.

40 XQ. 208.—Now, what were the ingredients used by the Minerals Separation in the usual flotation process as carried out at that time—in 1915? A.—Pine oil was used in connection with mineral oils, I think, in many of the operations.

XQ. 209.—And this organic sulphide, as it was termed, was proposed as another agent to be used with the pine oil and the flotation oil

For Plaintiff—H. D. Williams—Cross-Examination

that you referred to? A.—I don't think that that appears clearly. It was a substitute for the flotation agents.

XQ. 210.—Were so-called flotation agents used at that time with the oil? A.—Yes.

XQ. 211.—And, if I may refer you to the third claim attached to the stanol specification, where it reads:

“The employment of an organic compound in connection with oil to promote flotation.”—

10 that would indicate that it was probably what you have termed a “flotation agent”? A.—Yes.

XQ. 212.—What other agents were used at that time as flotation agents? A.—There were very many flotation agents.

XQ. 213.—Will you give me an example of one or two?

BY MR. COHEN: I think perhaps Mr. Roberts could help Mr. Williams out on that. Mr. Roberts is more of a technical man. (Informal discussion off the record.)

XQ. 214.—At any rate, if you can't there were others that were different compounds? A.—Yes.

20 BY MR. COHEN: That is the reason I objected to questioning Mr. Williams along this line. This is a technical question.

BY MR. SMART: Never mind. I will cross-examine Mr. Williams.

XQ. 215.—All of these specifications forming part of Exhibit 5 were dealing with different kinds of flotation agents, were they not. A.—Yes.

XQ. 216.—Now, then, if you will turn to this other one,—minola. A.—Yes.

XQ. 217.—That was the other one which became the subject of a patent; is that so? A.—Yes.

30 XQ. 218.—Now, that was a reconstructed pine oil mixed with sodium hydrate? A.—Yes.

XQ. 219.—Would that be a saponification? A.—I should think so, Yes.

XQ. 220.—Then, if you will turn to this last specification,—which consists of the last five pages of this document, Exhibit 5,—which is marked “Unnamed.” A.—Yes.

XQ. 221.—That refers to the combination of several flotation reagents together? A.—Yes.

XQ. 222.—And one of those reagents is what is termed an “alkali mercaptan,” is it not? A.—Yes.

40 XQ. 223.—Were you familiar with what a “mercaptan” was at that time? A.—I don't think I was.

XQ. 224.—Did you look up mercaptan or any similar compounds at that time when you were considering this specification? A.—I don't think I did.

For Plaintiff—H. D. Williams—Cross-Examination

XQ. 225.—You will observe that, in producing this so-called alkali mercaptan, the direction is to act on carbon di-sulphide, alcohol and water in the presence of a saturated solution of sodium hydrate. Did you make any investigation of the chemical literature or text-books to see whether that combination of those ingredients would produce an alkali mercaptan or not? A.—I did not.

XQ. 226.—Did you appreciate at that time that in this specification it was proposed that the several reagents named in the document we are now discussing would be employed together or singly?

10 BY MR. COHEN: Do you understand the question, Mr. Williams?

BY THE WITNESS: Yes.

BY MR. COHEN: Because I don't. A.—I think that was suggested, yes.

XQ. 227.—Now, before you were introduced to Mr. Martin, had you heard about him from any of those connected with the company or others with whom you were associated? A.—, don't think I had. I don't recollect that I had. He was brought to us by a gentleman who was present at the interview.—

20 BY MR. COHEN: Dr. Salinger, was it?

(Witness continues):—Mr. Salinger, who recommended him very highly as having invented some wonderful things; and it was largely on the recommendation of Mr. Sallinger that Mr. Ballot made the agreements with Martin.

XQ. 228.—By the way, I notice, while you were giving your evidence, you had open before you some record of some evidence. I wonder if you could identify that; it might save us some time. A.—That is a record in the interference in the United States Patent Office between Martin and Keller.

30 XQ. 229.—Yes; that is the interference No. 55,642, isn't it? A.—No. 55,642 interference proceeding.

XQ. 230.—You acted as counsel for Keller in those proceedings? A.—Yes.

XQ. 231.—And I daresay most of the evidence was taken under your direction and the brief filed? A.—It was largely my brief; in fact, I think it was wholly my brief.

XQ. 232.—Now, the evidence in that case dealt both with the facts relating to Keller's date of conception and so on and also on the public use? A.—Yes.

40 XQ. 233.—The public use being that which took place at Anaconda? A.—Yes.

XQ. 234.—In connection with which you took a good deal of evidence? A.—Yes.

XQ. 235.—And that public use was in relation to the invention described—if any, perhaps I should say, and for the purpose of

For Plaintiff—H. D. Williams—Cross-Examination

convenience I am going to refer to it as an invention—described in the Keller patent 1,554,216, which corresponds to the patent in this suit; and that evidence was summarized on page 3 of your brief as follows:

“This public use in the regular operation of the mills commenced on October 19, 1923, preceded by a long course of investigation and test operations and on small and large scale.”

That is a fair summary of the evidence there given, I take it? A.—Yes.

10 XQ. 236.—What became of the exhibits that were filed in connection with that interference? A.—I believe they were obtained from the Office after the interference was decided, and I believe that I have them in my files.

BY MR. SMART: I would like to have those exhibits produced.

BY MR. COHEN: I believe they are down at 11 Broadway.

BY MR. SMART: I don't know how far you are going to make me prove this all over again.

BY MR. COHEN: I don't know what you are trying to prove, but, if you will tell me, perhaps I can help you.

20 BY MR. SMART: The statement in the brief as to the Anaconda.

BY MR. COHEN: If the statement is in the brief, you can take it as fact now.

BY MR. SMART: Well, will you satisfy yourself. It will shorten it very much. I will read this statement from page 3 of this brief:

“This public use in the regular operation of the mills commenced on October 19, 1923.”

Now, I understand that was the public use of the invention described in the Keller patent No. 1,554,216, and that the mills referred to are the mills of the Anaconda Copper Company.

30 BY MR. COHEN: That is correct.

BY MR. SMART: Then, we can take that as agreed, with a view to save going into these records?

BY MR. COHEN: Yes.

XQ. 237.—And, on the basis of that evidence, Mr. Williams, the Patent Office held that a statutory bar had been established against Martin in the United States? A.—Yes.

(Informal discussion off the record)

Counsel agree that this statement from the brief shall be accepted as fact in this case:

40 “These operations were not carried on in secrecy, as indeed they could not have been. Mr. Rodgers (p. 27, Q. 111), Mr. Morrow (p. 39, Q. 39), and Mr. Bender (p. 42, Q. 16) testify that they were not secret, that visitors were admitted to the mill (Rodgers, p. 27, Q. 113), (Morrow, p. 39, Q. 40), (Bender,

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p. 42, Q. 17). As Mr. Morrow testifies, they had visitors from all parts of the country, and among these were visiting engineers from other plants (p. 27, Q. 113), and with visiting engineers there was no secrecy maintained (p. 28, Q. 114). Mr. Morrow also testifies that technical engineers were admitted to the mill (p. 39, Q. 41), as also does Mr. Bender (p. 43, Q. 18). Among these visitors are also mining engineering students who come for observation and instruction in mining methods, and Mr. Rodgers believes that there were student visitors during this period (p. 28, Qs. 115, 116).”

10

XQ. 238.—Now, if I may refer to this note you made at the interview with Mr. Martin and Mr. Higgins, which is exhibit 3. I think Mr. Higgins at that time was called the Chief Metallurgist of the company? A.—He was the Chief Metallurgist of the company, yes.

XQ. 239.—And he spent part of his time with the British Company and part with the American company? A.—Yes; he spent part of his time with the British company, and he came over to the United States and stayed several years with the American company, and then went back to England.

20

BY MR. SMART: I understand of counsel that Mr. Higgins is to be a witness at the trial?

BY MR. SCOTT: Yes, he is.

BY MR. SMART: If so, I can leave a number of matters.

BY MR. SCOTT }
BY MR. COHEN } Oh, yes.

XQ. 240.—Now this name, “Natrola,” at the bottom of the first page of this Exhibit 3, is what is afterwards referred to as “stanol”? A.—Yes.

XQ. 241.—And these figures of the proportions of alcohol to carbon disulphide and NaOH were those given by Mr. Martin? A.—Yes.

30

XQ. 242.—Was Mr. Martin asked as to what compound would result from the mixture of those three ingredients? A.—I don’t know that he was. He certainly didn’t give any indication that any compound was formed.

XQ. 243.—And you don’t remember asking him? A.—I don’t remember asking him, no.

XQ. 244.—It was understood, however, that some compound was to be formed by putting those three ingredients together in the proportions there indicated? A.—It was never understood that any compound would be formed.

40

XQ. 245.—What was the term “natrola” used to indicate? A.—The organic sulphide which he gave the proportions for making, and those proportions were such that very little organic sulphide

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would be made. It departed very largely from the molecular weights of the constituents.

XQ. 246.—Was there any comment during that discussion as to the departure from the molecular weight? A.—No, no. I don't think that Martin understood the molecular weights.

XQ. 247.—Was anything said at that time about the work he had previously carried out at the Utah Copper Company? A.—There was a general reference to work done on the process, but no specific reference.

10 XQ. 248.—Did you ask him to produce any records of the work he had done on this substance, natrola, at the Utah Copper Company? A.—I probably asked him to produce a record and he said he hadn't any.

XQ. 249.—They had been left at the Utah Copper Company? A.—Yes.

XQ. 250.—Have you ever seen those records? A.—I have seen copies of them in the testimony in the suit of Metals Recovery Company against Anaconda.

XQ. 251.—Were they ever in your possession? A.—No.

20 XQ. 252.—I suppose you were told about them at that time when you withdrew from the suit of the *Metals Recovery Company v. Anaconda*? A.—I was not told about the records.

XQ. 253.—But just of the facts which they were expected to show? A.—I was not informed as to that by Mr.—

BY MR. COHEN: Evans?

BY THE WITNESS: No.

BY MR. COHEN: Mr. Neave?

(Witness continues):—Mr. Neave.

30 XQ. 254.—There is a notation here in Exhibit 3, under "Natrola," "works well with hydrula"; what does that notation mean? A.—That was a statement made to me by Mr. Martin, and I put the notation down according to the notes.

XQ. 255.—Now, the "hydrula" referred to in that note that has just been quoted is the compound indicated in the paragraph under that name, "Hydrula"? A.—Yes; compound or mixture.

XQ. 256.—And hydrula was really a saponification of pine oil and resin? A.—Yes.

40 XQ. 257.—And potassium xanthate does work well with the saponified pine oil and resin in some cases where it is desired to have that kind of reagent? A.—I don't know that that is a fact, but I assume that it is.

XQ. 258.—Now, there is another notation there: "Exothermic reaction."— A.—Yes; that means that by this reaction heat is developed.

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XQ. 259.—And what reaction is there referred to? A.—Reaction between the substances that entered into the operation.

XQ. 260.—Yes; and it is a fact, is it not, that the reaction of alcohol, carbon disulphide, and sodium hydrate is exothermic? A.—Yes, it is; and the temperature has to be controlled very carefully in order to get the result desired.

XQ. 261.—At that time, still referring to the conference noted in Exhibit 3, was there no discussion as to the chemical reactions that would take place when these ingredients were put together? A.—No,
10 there was no discussion. Martin didn't seem to know.

XQ. 262.—May I suggest that you may have forgotten? You know now, do you not, from your perusal of the records in the *Metals Recovery Company v. Anaconda Copper Company*, that he did know of the reaction? A.—I don't know that.

XQ. 263.—How long did that conference take place? A.—A matter of an hour or so, I should judge.

XQ. 264.—I have had produced and I will show you if you wish photostat copy of the notes of Mr. Higgins to which you referred in your evidence and which, as you say, followed fairly closely your own
20 notes of that interview of March, 1915. There is one statement in his notes: "Natrola crystallizes out from H₂O." Now, will you tell me what that was; was that a statement of Mr. Martin's? A.—It must have been if Mr. Higgins took it down.

BY MR. COHEN: Are you going to introduce those notes, Mr. Smart?

BY MR. SMART: No; I only want to establish this.

XQ. 265.—What would you think that statement signified? A.—I don't know what its significance is.

XQ. 266.—It would imply that some kind of a compound was
30 to be crystallized out from that mixture, would it not?

BY MR. COHEN: I object to that as entirely speculative. Mr. Williams knows no more about it than we do. A.—I don't know.

XQ. 267.—Well, these notes are a summary of the discussion that took an hour or so, and I am trying to amplify them by inquiring as to what it was that was expected to crystallize out from this mixture; can you help me out on that? A.—There was no discussion as to what the substance was that would crystallize out of the mixture. He evidently did not know, because he did not tell us.

XQ. 268.—What were these bulletins that you have referred
40 to of Martin's? A.—They were the record of his work.

XQ. 269.—And they were each numbered? A.—Yes, numbered, in order.

XQ. 270.—And in the order in which he made them? A.—Yes.

XQ. 271.—And from time to time you saw certain of these bulletins? A.—Yes.

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XQ. 272.—And you finally saw a copy of this Bulletin No. 27?
A.—Yes.

XQ. 273.—Of which I have a copy here; that bulletin was prepared sometime in 1915? A.—I think so.

XQ. 274.—There are some notations on the photostat copy which I have; perhaps you could tell me in whose handwriting those notations are — on the bottom of page 1. A.—I can't recognize the handwriting.

XQ. 275.—It looks a little to me like Mr. Higgins'; doesn't it?
10 A.—Yes, it looks something like Mr. Higgins' writing.

XQ. 276.—That bulletin gives different proportions for the preparation of the stanol to those given in your notes, does it not?
A.—Yes.

XQ. 277.—It also gives an equation and refers to the end product as potassium ethyl xanthate?

BY MR. COHEN: I object to the question, as the witness has testified he never saw the bulletin until sometime in 1926, and because the document speaks for itself and does not need Mr. Williams to say that the document does or does not contain an equation. A.—It
20 contains an equation that was evidently copied out of a book on chemistry, and which does not contain the sodium compound which he used in place of the potassium compound.

BY MR. SMART: There are some other points about this document that I will have to bring out at some other time.

XQ. 278.—Now Exhibit 21 is, I take it, part of the document of your file with regard to the Keller application? A.—Yes.

XQ. 279.—Now, will you please produce the complete file or binder? A.—I don't know whether it could be produced or not.

XQ. 280.—Is this your original file of these documents? A.—I can't
30 say as to that.

XQ. 281.—Well, what was the practice in your office at that time when you received instructions to prepare a patent application?
A.—I passed it on to my assistant, who—

XQ. 282.—I meant as regards the making of a file and what you put in the file. A.—Why, these documents were the documents that came in regular order in the file. When they were bound up as this is, they were kept in an envelope, which contained the title of the case and a record of the proceedings in the case.

XQ. 283.—And the record of the instructions you received,
40 didn't it? A.—No, not necessarily. In this case, the file wrapper would contain the instructions that I received, unquestionably, now separated from this file.

XQ. 284.—Were they originally all together? A.—Originally all together, yes.

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XQ. 285.—When were they separated? A.—I don't know when they were separated. Counsel could tell you that.

XQ. 286.—When did you last see them together? A.—Oh, several years ago.

XQ. 287.—This wasn't the original file binder of these documents, was it? A.—No, I think not.

XQ. 288.—Now, will you produce the original file binder of these documents? A.—I will endeavor to do so.

BY MR. COHEN: You are not talking, Mr. Smart, about the
10 correspondence file,—the file of letters which would be kept in connection with the patent application? That would be under a separate binder. Is that what you mean?

BY MR. SMART: Yes, that's what I mean. This isn't the original file.

BY MR. COHEN: I will look for that.

XQ. 289.— In that file, Exhibit 21, I see a passage on the second page of the specification. I will read the whole sentence first:

20 “Excellent results were also obtained by agitating ore pulps with the complex mixture produced when $33\frac{1}{3}\%$ of pine oil was incorporated with an alcoholic solution of potassium hydrate, and xanthates or analogous substances were produced by adding carbon disulphide to this mixture.”

Can you tell me what other analogous substances were disclosed to you at the time that specification was prepared by you? A.—I cannot.

XQ. 290.—Can you tell me what analogous substances you had in mind when you used that language? A.—I cannot, now.

XQ. 291.—Now, I observe that, written in red on the original copy of the specification, there is an insertion:

30 “These form anions and cations in solution.”

And, if I understand correctly, that statement was inserted by an amendment “D” dated August 5, 1925? A.—Yes, that's right.

XQ. 292.—Can you tell me; in 1915, what was the relationship between the British company and the Minerals Separation American Syndicate (1913) Limited? A.—The British company was the parent company, and—

40 XQ. 293.—In what sense was it the parent company? A.—The original company that started inventions; and the American Syndicate was formed for the purpose of owning the American patents and carrying on the work in America.

XQ. 294.—The stock of the American company,—was that held by the British company? A.—I don't know as to that.

BY MR. SMART: Perhaps Dr. Gregory can tell us that?

BY MR. COHEN: Dr. Gregory can tell you where the information can be gotten.

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BY MR. SCOTT: Dr. Gregory can tell you that.

XQ. 295.—In one of these early documents, the letterhead bears this notation:

“Sole Agents—BEER, SOUNDHEIMER & CO.,
New York”;

who were they? A.—They were a firm of metallurgists in this city, who supplied an office for us at that time, I think; and they were our sole agents in this country.

XQ. 296.—And it was one of the members of that firm that
10 recommended Mr. Martin to you? A.—I don't know. I don't think so.

XQ. 297.—You said Mr. Salinger— A.—Mr. Salinger,—he was not a member of that firm. I don't remember what Mr. Salinger's position was. I don't think he was a member of the firm of Beer, Sondheimer & Co.

XQ. 298.—I see from the productions that there was a letter of July 30, 1915, sent by you to Minerals Separation, Limited, London, and which reads:

20 “At the request of Dr. Gregory, I am sending you herewith copies of all the material furnished to me by Mr. R. B. Martin in connection with his invention. I am about to take the matter up for preparation of patent application.”

Now, will you tell me on what file that letter—copy of that letter was kept. A.—That was in the correspondence file relating to Martin's applications.

BY MR. SMART: Will that be located?

BY MR. COHEN: I can tell you the system Mr. Williams had in his office at 61 Broadway. Every letter that went out of his office was copied on a letter press on that very thin Japanese letter paper.
30 When a sufficient number had been collected, they were bound in a volume. That was later taken away, and I think that is down there.

BY MR. SMART: Were there no second copies of it?

BY MR. COHEN: I don't know; there may have been. But that copy was taken from that press.

XQ. 299.—Is there any written notation of what copies of material were sent with that letter? A.—I should say copies of letters handed to Dr. Gregory and handed to me by Mr. Martin.

XQ. 300.—Were there copies of Exhibits 4 and 5?

BY MR. COHEN: Certainly Exhibit 4, and probably Exhibit 5.

40 XQ. 301.—Is there any way of checking what was sent with that letter? A.—I am quite sure I sent him copies of all communications we received from Martin.

XQ. 302.—Did you have a conference with Dr. Gregory at that time about what should be sent? A.—I probably did. I had his authority for sending it.

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XQ. 303.—Did you understand in 1915 from Dr. Gregory or Mr. Higgins that Martin had been conducting a number of experiments at the laboratory with regard to this compound named “stanol”?
A.—Yes. I would like to say that your designation of it as a “compound” is not justified by the disclosures. It was evidently a mixture.

XQ. 304.—I wasn’t anxious to commit you to its being a compound or not; but you did understand that some of the substance that they identified by the name of “stanol” was made and tried out in flotation processes during 1915? A.—Yes; and failed
10 utterly.

XQ. 305.—I suppose there were notes of the experiments which would indicate the results? A.—I don’t know as to that.
Martin —

XQ. 306.—I mean you are not able to say of your own knowledge that it had failed. A.—I can only say it was stated to me by Mr. Higgins that they all failed, and that Mr. Martin never made any claim that they all succeeded.

XQ. 307.—One of these reports, which is Bulletin No. 4, I think, deals with some experiments on certain ores; did you see a
20 copy of that bulletin at that time? A.—Not at the time it was given out, no.

XQ. 308.—How soon after did you see a copy of that bulletin? A.—Oh, some years after.

XQ. 309.—Do you know to whom these bulletins were circulated as a matter of course? A.—They were sent to Dr. Gregory and Mr. Higgins also.

XQ. 310.—I notice from the correspondence file of which I had production that, in the letter Mr. Higgins sent to Dr. Gregory
30 on October 14, 1915, dealing purely with kotrix and other of Martin’s inventions, the statement is made:

“If the invention can be placed on this basis, Mr. Williams assures me that the patent position will be both simplified and strengthened.”

Do you remember a conference with Mr. Higgins at that time about Martin’s inventions? A.—Yes; not very clearly.

(Recess : 1.25 to 2.30 P.M.)

XQ. 311.—I will read you a little passage now from a letter of the 30th of July, 1915, from Mr. Higgins to Dr. Gregory.—
40 A.—All right; go ahead.

XQ. 312.—Where he says:

“Re Martin’s Patent Specifications: I hope to be able to have shortly a further conference respecting these. They are, however, imperfect and will require considerable modification before filing. Recently at the Long Island City laboratory,

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Mr. Martin has made several of his preparations,—notably kotrix, stanol, grabanol, and arenol. It is essential that the processes suggested by him be properly protected with patents. I have spent much time in the careful examination of some of these compounds.”

Now, did Mr. Higgins have that conference with you at which these different things were discussed? A.—I think so, yes. We discussed the specifications and made up our minds that they were not clear disclosures of anything.

10 XQ. 313.—You did file applications on two of them? A.—Yes.

XQ. 314.—And you understood that Mr. Martin was working at the laboratory on those developments? A.—Yes.

XQ. 315.—I notice there is also a letter to you from Mr. Martin of December 29, 1915, in which he enclosed his Bulletin No. 16. A.—Yes.

XQ. 316.—There is nothing special about that bulletin itself; but that would indicate that these other bulletins numbered 1 to 15 had been prepared before that? A.—Yes.

20 XQ. 317.—Then, February 9, 1917, there is an assignment from Martin to Minerals Separation North American Corporation of two applications for patent, which I presume you prepared? A.—Yes.

XQ. 318.—Would instructions with regard to that be contained in the same file we are looking for regarding Martin?

BY MR. COHEN: Mr. Smart, I think we introduced a letter of February 17th.—

BY MR. SMART: Oh, yes; then that probably covers that.

XQ. 319.—I gather from a letter of Dr. Gregory of July 28, 1915, where he says:

30 “H. B. MARTIN: Higgins’ report is enclosed, which brings this matter up to date. We shall have a conference next week with Williams and you will hear from me.”—

that you had a second conference with Higgins at that time. A.—Yes.

BY MR. COHEN: What date was that?

BY MR. SMART: July 28, 1915.

BY MR. COHEN: And the report you read from previously was July 30th?

BY MR. SMART: In the previous question, I referred to the report of July 30th.

40 BY MR. COHEN: As a matter of fact, I introduced Mr. Williams’ diary entries, which indicate a conference on August 12th with Mr. Higgins.

BY MR. SMART: Have you a copy of the Offer No. 125, which is a letter from Mr. Ballot to Mr. Williams?

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BY MR. COHEN: We have supplied you with a copy of it. We don't have the original. I haven't it here. I can give it to you down at the other office if you want it. I am sure Mr. Scott gave you a copy of it.

BY MR. SCOTT: I gave you a copy of the only two paragraphs we had that were in our offer.

XQ. 320.—It appears from a copy of a letter from Mr. Ballot to you of August 17, 1915, that you were sent a copy of the letter of the 10th of August, 1915, from Mr. Ballot to Dr. Gregory; you
10 remember that, I suppose? A.—I remember it, yes.

BY MR. COHEN: Mr. Smart, where does it say that this letter of August 10th was received by Mr. Williams?

BY MR. SMART: In that copy of No. 125 that is missing.

BY MR. COHEN: Oh, I see.

BY MR. SMART: However, it is not very important. But there is apparently a document missing; that is, a report of Higgins. Are you able to find that?

BY MR. COHEN: I think so.

(Informal discussion off the record.)

20 BY MR. SMART: Perhaps this may clear it up.

XQ. 321.—In the letter of August 26, 1915, to Mr. Ballot from Dr. Gregory, there is a notation of a Higgins report, initialled "HDW", dated August 21st and 24th; have we got copies of those reports? A.—I don't know.

BY MR. SMART: Has counsel been able to find them?

BY MR. COHEN: No.

XQ. 322.—Where would you put copies of those reports that were sent to you? A.—In the file.

30 XQ. 323.—That is, these ones that are dealing with Martin's inventions would be put in the Martin file?

BY MR. COHEN: If Mr. Williams ever had them.

BY MR. SMART: Now, did you find that file?

BY MR. COHEN: No.

XQ. 324.—Just look at that letter of August 28, 1915, and the notation at the bottom.

A.—(Witness examines paper handed him by Mr. Smart.)

XQ. 325.—Do you remember the receipt of those reports from Mr. Higgins? A.—I presume I received them.

40 XQ. 326.—The date of those reports is after the date of the Bulletin No. 2. I suggest that they might have included a copy—

BY MR. COHEN: The matter is not clear in that question. The bulletin bears a certain date; it also bears a notation that it was not received by Mr. Higgins until a subsequent date.

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BY MR. SMART: Will you indicate that notation?

BY MR. COHEN: Did we produce Mr. Higgins' copy of Bulletin No. 27? I will substitute, when we get down there, another copy of Bulletin No. 2, which bears the date when it was received by Mr. Higgins, the date being in Mr. Higgins' handwriting; I think September 20th.

BY MR. SMART: One report was August 21st and one was August 24th.

10 BY MR. COHEN: I am not promising to produce those, but will get you another copy of Bulletin No. 2.

BY MR. SMART: Which shows the date when Mr. Higgins received it?

BY MR. COHEN: Yes. Of the documents sent to London, we have gotten back as much as we could. Others, that were destroyed in the thirty years that have elapsed, of course, we can't produce.

XQ. 327.—Now, letter of the 1st of October, 1915, from Mr. Ballot to Dr. Gregory, was sent in your care; could you tell me just why that would be? A.—So that it would be delivered to 61 Broadway, which was my office.

20 XQ. 328.—Something that should be brought to your attention; is that right? A.—I suppose so, yes.

BY MR. COHEN: There is a great deal in that letter that has nothing to do with Martin.

XQ. 329.—In the item dealing with Martin's invention, it says:

30 "The copy of his report dated August 15th re preparatiRN of flotation agent kotrix etc., which you enclosed with yours of the 17th is worded in that same pedantic and to me objectionable language, because I have not the time and patience to disentangle his meaning but must therefore live in hopes that with Mr. Higgins' assistance, Mr. Williams and yourself will eventually get to know what it means and embody it in a patent application if necessary."

Now, I suggest to you that that report dated August 15th was this Bulletin No. 2; is that your understanding? A.—I don't think I had seen that bulletin at that time.

XQ. 330.—Did you discuss this part of the letter with Dr. Gregory after you— A.—I don't think I did, no.

XQ. 331.—Is there any record of consultations with Dr. Gregory at that time?

40 BY MR. COHEN: No, there isn't; no consultations either.

XQ. 332.—I notice in some of these letters the term, "xanthogenate," is used.—

BY MR. COHEN: Which letters, Mr. Smart?

BY MR. SMART: Those that have been produced.

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(Question continued):—Was that used at that time as a synonym for “xanthate”? A.—When I first heard of “xanthate,” it was in connection with Mr. Keller’s work. Mr. Keller used “xanthogenate” as synonymous with “xanthate.”

XQ. 333.—I think you acted for Keller in the interference with Sayre, which was interference 50394? A.—Yes.

XQ. 334.—And both in that case and in the interference between Martin and Keller, No. 55642, the evidence with regard to Keller’s conception was put in? A.—Yes.

10 XQ. 335.—And, in both of those, as well as in the statement of the date of invention which is filed in this case, the date relied on for conception was the 18th of September, 1922. I would ask you to read into the record the extract from the notebook on which that was based.

BY MR. COHEN: You asked Mr. Williams to read that in?

BY MR. SMART: Yes.

BY MR. COHEN: Do you mind if I read for him?

BY MR. SMART: Do.

BY MR. COHEN: The entry reads:

20 “9/18/22. Use a mixture of carbon disulphide & Alcoholic Potash as a sulphidizing agent.”

XQ. 336.—You regarded that at that time as a completed conception of the invention. A.—Yes.

XQ. 337.—Then, on the next day, or on the 22nd, I think, there was another entry.—

BY MR. COHEN: Are you questioning Mr. Williams now as an expert on patents or as a witness?

BY MR. SMART: I am cross-examining Mr. Williams.

(Question continued):—On the next day, at least on the 22nd of 30 September, 1922, there was another entry, which I will ask you to confirm, which reads:

“Make the following combinations to be tried out. Dissolve CS_2 in oils such as creosote, phenols, benzene, xylene, pine oil. Add caustic soda and use as a sulphidizing agent. Conversely, dissolve caustic soda in oils or other alcoholic solvents such as alcohol, pine oil, xylene, benzene &c. Add CS_2 and use as flotation agent.”

That is taken from Mr. Keller’s notebook? A.—Yes.

40 XQ. 338.—And you searched and did not find any other written note or memorandum with regard to the invention until March, 1923? A.—I don’t remember exactly.

SQ. 339.—May I refresh your memory? I think it was March 2, 1923, is the first record of the tests by Mr. Lewis. A.—Yes.

BY MR. COHEN: First record of a test by Mr. Lewis.

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XQ. 340.—What is a sulphidizing agent such as is referred to in that note? A.—That is the carbon disulphide, I think.

XQ. 341.—Exhibit 19 is a letter from Mr. Ballot to you of September 20, 1920, with regard to Luckenbach. Now, in what file would that go? A.—I don't know; probably a Luckenbach file.

XQ. 342.—Have you got a Luckenbach file that you can produce? A.—Yes.

BY MR. SMART: You have got that?

BY MR. COHEN: Not here. It is down at the other office.
10 I believe that is at my office at 70 Pine Street. The office we are going to is 11 Broadway.

XQ. 343.—Did they send over any documents to you about Luckenbach from England? A.—I don't know.

XQ. 344.—I notice that in a letter of December 2, 1920, to the plaintiff, Exhibit 20, you refer to a copy of the "Luckenbach specification handed me." A.—Yes.

XQ. 345.—Can you tell me which specification that was; the file may show that? A.—Yes.

BY MR. COHEN: I think Exhibit 19 shows it. Exhibit 20 is
20 obviously an opinion rendered in response to Exhibit 19.

BY MR. SMART: What I want to get at is this, and perhaps you can help clear it up:

XQ. 346.—It appears from the correspondence that has been produced as to what took place when they were investigating Luckenbach's processes that the representatives of Luckenbach handed copies of two Canadian specifications, which were then filed under Serial Nos. 243, 950 and 219,473, and that those copies of the specifications were sent to Mr. Ballot, in New York; and I want to ask whether you had perused copies of those specifications at that time.
30 A.—I don't think I did.

XQ. 347.—I find in a letter from Mr. Nutter to the company in New York of May 7, 1923, reference to a letter from them of the 1st of May enclosing a copy of a letter from Williams & Pritchard with regard to xanthates as a flotation agent. Can you tell me what is that letter that is referred to?

BY MR. COHEN: Does it give the date of the letter there?

BY MR. SMART: No; that is the one way it is referred to.

BY MR. COHEN: We introduced one here as Exhibit 16, dated
40 April 30, 1923, which is probably the one you have reference to. That is the one that asked about xanthate as a flotation agent.
(Question continued): That presumably was this letter, Exhibit 16?
A.—Yes.

XQ. 348.—Now, in a letter from Mr. Keller to Mr. Nutter of July 27, 1923, of which I show you a copy, reference is made to alkali cellulose xanthates and to what is termed "starch xanthate"; and

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I would ask you whether the information contained in that letter was in your possession before you filed the Canadian Patent Office application of Keller which resulted in the patent in this suit. A.—I do not remember.

XQ. 349.—There are also a series of letters, dated August 2nd, from Mr. Keller to Mr. Nutter, dealing with alkali xanthates and referring in particular to ammonium xanthate; were you aware of the possibility of the use of ammonium xanthate before you filed the application for the patent in suit? A.—I don't remember.

10 XQ. 350.—You don't remember? A.—I don't remember, no.

XQ. 351.—And would the same answer apply to amyl xanthate? A.—Yes.

XQ. 352.—And benzol xanthate? A.—Yes.

XQ. 353.—You made some reference to withdrawal from the suit of *Metals Recovery v. Anaconda Copper Company*. After you withdrew, that suit went on to trial and to the Court of Appeal? A.—Yes.

XQ. 354.—And, in the decisions, both courts found that Martin in 1915 had proposed xanthate as a flotation agent?

20 BY MR. COHEN: I object to that. Those cases are reported and speak for themselves, and any statement Mr. Williams might make about them would be characterization.

XQ. 355.—Well, you were aware of those decisions before you gave your evidence in this case? A.—Yes.

XQ. 356.—The evidence with regard to work at the Utah Copper Company by Mr. Martin was part of the evidence in the interference of *Keller v. Martin*, in which you acted for Keller?

BY MR. COHEN: Same objection. A.—Yes.

30 XQ. 357.—Then, you had an opportunity during the course of that interference to examine the original exhibits which Martin had filed in the Anaconda case? A.—We had copies of them, yes.

BY MR. SMART: How are we going to handle these files?

BY MR. COHEN: I suggest that, when we adjourn down to 11 Broadway, I make a search.

BY MR. SMART: We might adjourn. If it is only a matter of documents, we might be able to agree.

BY MR. COHEN: I have a short redirect.

RE-DIRECT-EXAMINATION BY MR. COHEN

40 RDQ. 358.—I want to talk about your files, Mr. Williams, Some five years ago, there was an action brought against Minerals Separation, in which your files and your evidence were relevant; I am referring to the action brought by Martin against Minerals Separation North American Corporation. A.—Yes.

For Plaintiff—H. D. Williams—Re-Direct-Examination

RDQ. 359.—Do you remember that you were asked by Minerals Separation—

BY MR. SMART: I object to leading the witness this way.

RDQ. 360.—What did you do with your files at that time?
A.—I don't remember.

RDQ. 361.—Do you remember who represented Minerals Separation in that litigation? A.—Mr. Albert A. Cohen.

RDQ. 362.—Do you remember that his office asked for that—

BY MR. SMART: I object to that.

10 BY MR. COHEN: I have exceeded his recollection, not his knowledge.

BY MR. SMART: When you have exceeded his recollection, that ends it. You certainly can't lead the witness like that.

RDQ. 363.—Are the files in your office, Mr. Williams? A.—I don't know.

RDQ. 364.—Do you remember that a short time ago, within the last few months, you were asked for your Luckenbach files?
A.—No.

20 RDQ. 365.—Perhaps it was Mr. Morse, your partner, who was asked for them? A.—Yes.

RDQ. 366.—You were asked some questions about the patent specification for stanol which Martin submitted to Dr. Gregory and which was in turn handed to you; you were asked whether the molecular proportions of some of the substances therein mentioned were not indicated by the disclosure of the specification——

BY MR. SMART: I object to that. That is not a paraphrase of the question put to him.

BY MR. COHEN: I will rephrase the question.

30 RDQ. 367.—Do you remember this phrase from that patent specification:

“The presence of water and other impurities are essential in promoting the formation of the desired compound.”?
A.—Yes.

RDQ. 368.—Did that indicate to you that molecular proportions of any indicated substance were suggested? A.—No.

RDQ. 369.—It indicated the contrary to you, did it not?

BY MR. SMART: Well, really, now. Don't lead this witness that way. A. —Yes.

RDQ. 370.—Do you remember this sentence:

40 “The reaction that takes place is complicated and many compounds that may be classed as impurities are formed, of which the mercaptans, alkynes and esters, are hereby classed as beneficial to the reaction and] necessary in the application of

For Plaintiff—H. D. Williams—Re-Direct-Examination

compounding the alkali organic sulphide and the ultimate employment of this agent in promoting flotation.”? A.—Yes, I remember that.

RDQ. 371.—Did that indicate to you a simple reaction or a complicated reaction? A.—It indicated a very complicated reaction.

RDQ. 372. Did it indicate to you an end product which was a compound or a mixture? A.—A mixture.

RDQ. 373.—Did it indicate to you a mixture whose constituents were definite substances? A.—No.

10 RDQ. 374.—Let me read you a further phrase from that disclosure:

“Variation may be practiced in the process of manufacturing the alkali organic sulphide by varying and selecting the raw organic material. The essential feature is that the raw material must consist of a purchaseable or commercial obtainable substance, that will combine with an alkali or an alkali sulphide and an organic sulphide in producing the necessary alkali organic sulphide.”

Did that indicate to you the necessity for any definite substances to
20 to go into the mixture? A.—No.

RDQ. 375.—It indicated the contrary to you, didn't it?

BY MR. SMART: Well—

A.—Yes.

RDQ. 376.—I will read you a further paragraph from this specification,—the second paragraph on the second page:

“Many localities containing supplies of similar reagents would commercially change the adoption of this formula, and should similar reagents be employed, the effect would be the same.

30 What did that indicate to you? A.—That a complex mixture of substances was necessary to the mixture.

RDQ. 377.—Did it indicate to you that any particularly prescribed substances were necessary to the mixture? A.—No.

RDQ. 378.—Mr. Smart read to you the immediately preceding paragraph, which names certain substances to go into the mixture or compound; was it your understanding that those were the only substances that could be used to produce stanol? A.—No.

RDQ. 379.—What was your understanding in that respect? A.—That stanol was a complex mixture of substances.

40 RDQ. 380.—What substances? A.—Substances named in the specification.

RDQ. 381.—Now, in the discussion that you had with Mr. Martin on March 6, 1915, in which he made oral disclosure to you,

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did he say to you that molecular proportions were necessary in compounding his mixture; he indicated to you certain proportions, didn't he, and you wrote them down? A.—Yes.

RDQ. 382.—Did he indicate to you that the proportions he indicated were fixed proportions? A.—I don't think so.

RDQ. 383.—What is your best recollection now? A.—My recollection is that the proportions would produce a complex mixture and that the mixture depended upon a complex mixture of substances.

RDQ. 384.—Now, Mr. Smart read to you the third claim of
10 this specification; did you prior to that read the first two claims, which are as follows:

“1st. The production of an organic compound, that may be employed to replace oil in flotation.

“2nd The employment of an organic compound, in preference to oil to influence flotation.”

Do you remember that? A.—Yes.

RDQ. 385.—Did you understand that to indicate a reagent which was to be used with an oil? A.—No.

RDQ. 386.—Did you remember, when you read that specifica-
20 tion, that you had written in your notes of Martin's oral disclosure the words: “floats without oil”? A.—Yes.

RDQ. 387.—What did you understand him to mean by the words, “floats without oil”? A.—That it was a flotation agent.

RDQ. 388.—As well as a collecting agent? A.—Yes.

RDQ. 389.—You said in your testimony that Messrs. Beer, Sondheimer & Co. were general agents of the company; do you know how long they remained general agents of the company? A.—No, I do not.

RDQ. 390.—Do you remember whether or not their connection
30 was severed? A.—I don't remember that.

RDQ. 391.—Do you know whether any of the company's licensees declined to pay royalties to Minerals Separation following the decision in Metals Recovery against Anaconda? A.—I don't think they did.

RDQ. 392.—So far as you know, every licensee continued to pay as they did before? A.—Yes.

BY MR. COHEN: That is all.

BY MR. SMART: We can close the examination subject to reopening it if I want some further questions on the files.

40 BY MR. COHEN: If necessary, yes.

For Plaintiff—H. D. Williams—Statement

EXAMINATION CLOSED (3.50 P.M.)

The following statements were added to the examination of Mr. Williams when counsel met on Wednesday, February 2, 1944, at the office of Minerals Separation North American Corporation, 11 Broadway, New York, New York, for the examination on discovery of Dr. Seth Gregory.)

BY MR. COHEN: Let the record show that counsel for plaintiff produced for the inspection of Mr. Smart three files compiled in the office of Henry D. Williams:

10 The first entitled:

“RHETHERFORD B. MARTIN
ORE CONCENTRATION INVENTION
(RECONSTRUCTION OIL)
PATENT RECEIVED—August 14, 1917.
No. 1,236,857.”

The second entitled:

20 “RHETHERFORD B. MARTIN
ORE CONCENTRATION
ISSUED August 14, 1917
Patent No. 1,236,856.”

The third entitled:

“MINERALS SEPARATION NORTH AMERICAN
CORPORATION
R. B. MARTIN EMPLOYMENT AGREEMENT
AND UNFILED APPLICATIONS”;

together with the documents enclosed in those files.

30 The parties also stipulate that a letter from Mr. Ballot to Henry D. Williams, dated October 19, 1920, together with an enclosed specification corresponding to Canadian application Serial No. 243,950 be marked in evidence as if identified by Mr. Williams.

I, therefore, offer the two documents as Exhibits 22 and 22-A of the Plaintiff. (So marked by the commissioner.)

BY MR. SMART: That closes Mr. Williams' deposition?

BY MR. COHEN: Yes.

DEPOSITION CLOSED

~~PLAIN~~
For ~~Dr. S. Gregory~~—Dr. S. Gregory—Direct

Examination of Dr. SETH GREGORY for discovery by counsel for the defendant, under commission dated the 13th day of January, 1944, and pursuant to arrangement and agreement between counsel, at the office of Minerals Separation North American Corporation, No. 11 Broadway, in the Borough of Manhattan, City, County, and State of New York, in the United States of America, before Augusta P. Boos, of No. 220 Broadway, New York, New York, the commissioner named in the said commission

APPEARANCES:

10

For Plaintiff:

MR. W. L. SCOTT, K.C., of Ottawa, Canada,
MR. HENRY COHEN, of 70 Pine Street,
New York, New York;

For Defendant:

MR. RUSSEL S. SMART, K.C.,
MR. P. C. FINLAY,
of Ottawa, Canada.

SETH GREGORY, having been first duly sworn by the commissioner, testified as follows:

20

DIRECT-EXAMINATION BY MR. SMART:

Q. 1.—What is your position in the plaintiff company now, Dr. Gregory? A.—I am president. I have been president since 1922.

Q. 2.—And this company succeeded to a previous company, did it? A.—Yes; to the 1913 Syndicate—American Syndicate.

Q. 3.—That was the Minerals Separation Syndicate?

By MR. COHEN: Minerals Separation American Syndicate (1913) Limited.

Q. 4.—And when did that transfer take place? A.—Let me see, now. In 1917 or 1916—1917.

30

Q. 5.—And you were an officer of the earlier company? A.—Yes; I was vice-president, I think, of the 1913 Syndicate.

By MR. COHEN: Yes. December 7, 1916.

Q. 6.—And what was the relation with the British company, Minerals Separation, Limited? A.—At the moment?

Q. 7.—Give it to me from the beginning if there have been any changes. A.—The relation is exactly the same. It was arranged that we should exchange if we got new inventions—we should give to each other at cost. That is briefly the position.

40 A.—But the stock-holding relationship,—what was that? A.—That has nothing to do with that.

PLAINTIFF

For ~~Defendant~~—Dr. S. Gregory—Direct

Q. 9.—They were really independent companies? A.—Independent companies.

Q. 10.—That is, the three: the British company and the two American companies? A.—No; I don't know exactly. I don't want to say anything that isn't perfectly all right. Just what do you mean?

Q. 11.—Let us go in steps: the original company in England, that dealt with the Minerals Separation patents, was the Minerals Separation, Limited? A.—Minerals Separation, Limited.

10 Q. 12.—A British company? A.—A British company and; then may I just—

Q. 13.—Just follow it on. A.—Then, this 1913 Syndicate brought in more capital for developing here, and two new people were put in: Lazard Freres of London and Beer, Sondheimer & Co. Minerals Separation then transferred the patents in this country and Canada and Mexico and I believe Cuba.

BY THE WITNESS (To Mr. Cohen): If I make any mistakes, let me know.

20 Q. 14.—Then, if I could put it this way: the British company transferred certain rights to the American company in certain territories with the agreement thereafter to exchange information relating to similar inventions? A.—To exchange any new inventions.

Q. 15.—But, after that date, which was presumably about 1913—the transfer and the organization of the American company—

BY MR. COHEN: June 27, 1913.

(Question continued):—Thereafter they were operated as separate companies? A.—Yes, that's right.

30 Q. 16.—Now, then, you, I think, carried on the negotiations with one Rhetherford B. Martin, in the beginning of 1915, by which he became employed by you? A.—No, I had nothing to do with that. I never saw Martin, as far as my recollection goes. All that was done by Mr. Ballot.

Q. 17.—But you were managing director at that time, and he was under direction and he reported to you? A.—He was under Mr. Ballot's direction. And I was never managing director, you know.

40 Q. 18.—Well, I notice one of the early letters here was addressed to you by Mr, Martin. A.—Oh, that's possible. (Mr Smart shows letter to witness.) That's quite right; he would address it to me, as I happened to be here and Mr. Ballot wasn't.

Q. 19.—Where was Mr. Ballot then? A.—He was in England, you see, then,—the day the letter came in.

BY MR. COHEN: The letter has not been identified.

BY THE WITNESS: I go from my memory, but can easily identify it.

~~PLAINTIFF~~
For ~~Dr. Gregory~~—Dr. S. Gregory—Direct

Q. 20.—What position did Mr. Ballot occupy in the company?
A.—He was president.

Q. 21.—He was president of the Minerals Separation American Syndicate (1913) Limited? A.—Both of them.

Q. 22.—He was president of the American company and the British company? A.—I am not sure whether chairman or president.

Q. 23.—Yes, but he had the equivalent position and presumably spent part of his time on one side of the Atlantic and part on the other? A.—No. After a short time, he— After 19— We haven't
10 come to the North American Corporation, have we?

BY MR. SMART: Yes, we have.

(Answer continued):—If so, he practically came over here and stayed here all the time after that.

BY MR. COHEN: After the North American Corporation was formed?

BY THE WITNESS: Yes.

BY MR. COHEN: And prior to that?

BY THE WITNESS: Prior to that time, he went backwards and forwards during that time.

Q. 24.—Now, let us deal with the years between 1913 and 1917,
—is it?

BY MR. COHEN: December, 1916.

(Question continued): Anyway, those few years, and we are dealing with the American company, Minerals Separation American Syndicate (1913) Limited. During that period, Mr. Ballot was president; and what office did you occupy? A.—I was vice-chairman or vice-president. What they called vice-chairman, I think.

Q. 25.—Vice-president? A.—Yes.

Q. 26.—Have you technical qualifications? A.—No. sir.

BY MR. SMART: Now, there have been a number of letters
30 produced pursuant to the Rules in Canada; some of these letters are addressed to Dr. Gregory and some of them are written by him. I am wondering whether we might not save some time by making an agreement as to putting these letters in.

BY MR. COHEN: I intend to introduce all the letters which we produced which passed between Dr. Gregory and Mr. Ballot. I suppose that is what you have in mind. They are all numbered in the Affidavit of Production.

BY MR. SMART: Perhaps, if you can let me see the original
40 productions, I can just go through them. But, before we get to that, there are one or two preliminary things.

Mr. Williams has already given evidence about the agreement that was made with Mr. Martin on the 6th of March, 1915; perhaps you will produce the original of the letter of March 19, 1915, from Martin to Dr. Gregory.

~~PLAINTIFF~~
For ~~Dr. S. Gregory~~—Dr. S. Gregory—Direct

BY MR. COHEN: Is that the one with the list of the inventions?

BY MR. SMART: No. (Shows papers to Mr. Cohen.)

(Mr. Cohen hands letter to Mr. Smart.)

Q. 27.—Now, this letter from Martin,—R. B. Martin,—addressed to you, of March 19, 1915, with two lists attached, was a letter received by you from Martin at that time?

BY MR. COHEN: The letter is the letter in which he submits lists covering necessary laboratory equipment for the immediate purpose of performing such work that may be essential in the further-
10
ance of the several applications for patent, and he encloses lists of chemicals and light laboratory apparatus necessary to set up the laboratory. The question is: do you identify the letter.

BY MR. SMART: Yes.

A.—Yes.

Q. 28.—That was equipment to be installed in the laboratory in which Mr. Martin was to carry on his experiments? A.—That's right.

BY MR. SMART: I will have that letter of March 19, 1915, with the lists, marked as Defendant's Exhibit 1 on Discovery. (So
20 marked by commissioner.)

Q. 29.—The next letter I'd like you to identify is one of May 6, 1915, to you from Martin; do you identify that letter? A.—Yes.

BY MR. SMART: I will have that letter of May 6, 1915, from R. B. Martin, to Dr. S. Gregory, marked as Defendant's Exhibit 2 on Discovery. (So marked by commissioner.)

Q. 30.—Then, Mr. Williams has just given evidence about a letter from Martin to you of March 19, 1915, which is Exhibit 4 on his examination, which was a letter from Mr. Martin attaching copies of specifications or what he described as "Patent Specification"
30 of certain compounds; and I take it that this exhibit, which we have available here, was received by you and transmitted to Mr. Williams and to Mr. Higgins at that time. A.—I think, if I may say, the usual course of mine was: it probably never came to me, but came to Mr. Higgins. But, anyway, I would pass it on to Mr. Higgins, because I wouldn't know a thing about it. The usual way would be for Higgins to handle it. I could swear I never saw it. Too much for me to read.

Q. 31.—But that way it would get to Mr. Williams? A.—Yes, it would get to Mr. Williams. He handled the thing from the start.

40 Q. 32.—Then, as I gather, although nominally addressed to you, you either handed it to Mr. Higgins, or Mr. Higgins took charge? A.—Yes; I was just the instrument. I would refuse to take it, because I don't know anything at all about it.

Q. 33.—Then, there follows in your productions a series of what are termed "bulletins," numbered 1 to 88, by Mr. R. B. Martin;

For ~~PLAINTIFF~~ Dr. S. Gregory—Direct

those, I take it, were bulletins on his work at the laboratory? A.—I suppose so, yes.

Q. 34.—And those bulletins, I should judge, were copied and circulated to yourself and Mr. Higgins? A.—I don't think so; that is, not to my knowledge. It would have been done without my knowledge. I have no recollection of it. I think Mr. Ballot would get furious if you did that.

BY MR. SMART: Will you let me see the Production 5.
(Mr. Cohen looks for document.)

10 Q. 35.—While we are waiting, what position did Mr. Higgins occupy in the company then? A.—He was the chief metallurgist of the Minerals Separation.

Q. 36.—That is, of the English company? A.—Yes.

Q. 37.—And what position did he occupy in the American company? A.—I should say perhaps the same thing. I'm not sure they gave him any title, but he was loaned to us by the London company.

Q. 38.—You have a set of these bulletins in your file here? A. —Yes; but I wouldn't swear that I have even seen them.

20 Q. 39.—Yes, but you have a file here of these bulletins, 1 to 88, of Mr. Martin? A.—If you say so, and if they say so. (Witness indicates his counsel.)

Q. 40.—I am asking you. You are the only person I can ask questions and get them on the record. A.—Unfortunately, you see, I can only say: if it is there, it is there. I haven't seen them. I don't know how to answer you to be correct—on the right side.

BY THE WITNESS (to Mr. Roberts of Minerals Separation North American Corporation, who is present): Have we got a file, Mr. Roberts?

30 BY MR. ROBERTS: We had a file. We have a file as it stands—many have been taken out. How complete it is now, I couldn't tell you. We have all those bulletins between Mr. Cohen's and our files. A.—According to Mr. Roberts, we have them.

BY MR. COHEN: I think perhaps Mr. Smart means something else by the word "file." If he will explain that to you, perhaps Mr. Roberts can—

BY MR. SMART: I guess we will have to start at the beginning again. Let me see this Bulletin No. 1.

(Mr. Cohen hands document to Mr. Smart.)

40 Q. 41.—Now, I am showing you this Bulletin No. 1. A.—What do you want me to do with it, sir?

Q. 42.—I will ask you to tell me what it is.

BY THE WITNESS: What is it, Mr. Cohen; I can't see it.

~~PLAINTIFF~~
 For ~~Defendant~~—Dr. S. Gregory—Direct

BY MR. COHEN: It is a typewritten document of 111 pages enclosed in a black binder and marked "Bulletin No. 1: Classification of Permissible Oil Employed in Flotation by R. B. Martin, Ph.D., Research Chemical Engineer."

BY THE WITNESS: Is that in our possession, Mr. Roberts?

BY MR. ROBERTS: Yes, sir. A.—Right.

Q. 43.—That is in your possession; when did it come in your possession? A.—I couldn't tell you myself. Mr. Higgins could tell you. I was away all the time.

10 BY THE WITNESS: (to Mr. Roberts): Where was the case we were on?

BY MR. ROBERTS: Wilmington.

(Answer continued): At Wilmington.

BY MR. COHEN: I think Dr. Gregory has made it perfectly clear by now.

BY THE WITNESS: Mr. Higgins can tell you all that.

BY MR. SMART: Mr. Higgins, unfortunately, is not here, and you are the only person I can examine at the moment.

20 BY THE WITNESS: But you don't want me to tell you something I don't know.

Q. 44.—Now, there are going to be 88 of these bulletins.—A. And they are all the same as far as I am concerned.

Q. 45.—They are all in your own files?

BY THE WITNESS: Mr. Roberts, are they in our files?

BY MR. ROBERTS: In our own files and Mr. Cohen's.

BY MR. COHEN: We have one copy of at least the 81 bulletins, and more than one copy of a considerable number of them.

30 Q. 46.—Well, you are not going to suggest to me that you do not remember receiving these bulletins from time to time during the period of time that Mr. Martin was working for you? A.—I not only suggest, I am sure I never paid any attention to them. As a mere formality, it might come to me, but I would just pass it on. I wouldn't look at it if it came to me. But probably it has come to Mr. Higgins.

Q. 47.—Nevertheless, the fact is you wrote letters about them? A.—I wrote letters only because Mr. Higgins told me.

40 Q. 48.—And signed the letters. A.—And signed the letters because Mr. Higgins told me. I had absolute faith in him. Suppose I received bulletins? I don't mind saying I received it. But I must refuse to acknowledge that I know about it. I don't know anything about it.

Q. 49.—Do you mean to tell me that at the present time your memory is such that you don't remember having had any of these bulletins in your hands? A.—I may have held—

~~PLATE F~~
For ~~Exhibit~~—Dr. S. Gregory—Direct

BY MR. COHEN: The answer is yes, Doctor, you don't remember having had them.

(Answer continued): You see, I don't want to be technical. I haven't the slightest recollection, but I wouldn't like to swear that I didn't touch one or get one and pass it on to Mr. Higgins.

Q. 50.—Well, you knew Mr. Martin was hired for—A.—Exactly.

Q. 51.—He was hired to work on certain inventions?
A.—Exactly.

Q. 52.—And you knew that from time to time he was making
10 reports on these inventions? A.—Yes.

Q. 53.—And you knew that from time to time these reports were coming into your office? A.—That is possible, yes.

Q. 54.—How big an office had you at that time? A.—We had a small office. We had a room with Beer, Sondheimer.

Q. 55.—You had one— A.—Room.

Q. 56.—And you had how many employees?

BY MR. COHEN: You are talking about employees of the London company or the American company?

BY MR. SMART: The American company.
20 A.—I can't remember.

BY THE WITNESS: Is there anyone who can give me that information so that Mr. Smart can have it?

BY MR. COHEN: We will supply that answer.

BY MR. ROBERTS: Might be three or four.

BY THE WITNESS (to Mr. Roberts): I wish, Mr. Roberts, you would find that out and give it to Mr. Smart, please.

Q. 57.—What I want to know is: you were in charge of this office? A.—I was in charge—in charge of a certain section; that is to say, I was looking after the legal side of it all the time.

Q. 58.—And you would have charge of the legal documents?
30 A.—Well, I think Mr. Williams would have charge of that. I had no staff to do anything for me. I never had anything to do. It was all done, as I say, through Mr. Williams, Mr. Higgins, and Mr. Ballot. I am sorry I have to keep on evading things which I don't know. I can't help it; I don't know it. You asked me how many we were on the staff; I haven't the faintest idea. If I had known you were asking these questions, I might have found it out for you.

Q. 59.—We might give you an opportunity to do it. A.—If
40 you let me know, anything I can't give you from personal knowledge, I will find out and let you have it. I don't want to keep anything back. Anything we have you are welcome to it.

Q. 60.—Now, these bulletins were received from time to time from Mr. Martin during the period running from 1915 to 1926; do you remember that? A.—I think so. I have got the same answer, because I never paid any attention to bulletins.

For ~~Dr. S. Gregory~~ Dr. S. Gregory—Direct

Q. 61.—Well, who was in charge of the office—the records of the office—if you were not? A.—Well, Mr. Allen was at one time; and you were. (The witness addressed Mr. Roberts.)

BY MR. ROBERTS: June 1922 I succeeded him.

Q. 62.—Then, perhaps, we could examine Mr. Roberts if he is in charge of these records?

BY MR. COHEN: From 1922 on, yes. A.—From 1922 on, surely.

BY MR. SMART: Really, I am bound to find out about these
10 documents.

BY MR. COHEN: If you will tell us what you want, we will tell you.

BY MR. SMART: If you will agree to it, we can save a lot of time.

BY MR. COHEN: If Mr. Smart will tell us what he wants us to find out, we will do it.

BY MR. SMART: That during the period from 1915 to 1926 these bulletins were received from Mr. Martin and filed away at approximately the date which these bulletins bear.

20 BY MR. COHEN: With one qualification, we are perfectly willing to concede that, and that is that some of these documents were received a considerable time later than the date they bear. That fact appears on the originals of those documents. Subject to that qualification, we will admit it.

BY MR. SMART: Let's get those documents in and we will get them dated. Then we can agree about it. I only want a few of them.

BY MR. COHEN: Now, tell me what documents you want and we will give them to you.

30 BY MR. SCOTT: If you want to examine Mr. Roberts—

BY MR. SMART: This will avoid the necessity of that.

BY MR. SMART: No. 1: I don't think we will need that. The next is Bulletin No. 2; and perhaps then you would state about the date of receipt of that.

BY MR. COHEN: Well, I won't be giving testimony. I'd rather not do that. I will hand you a copy of Bulletin No. 2 with certain notations on it.

40 BY MR. SMART: Then, may I take it this Bulletin No. 2 was received by Mr. Higgins on the 14th of September, 1915, and by Mr. Ballot in London on the 27th of September, 1915?

BY MR. COHEN: No, I will not concede that. You have to get that from Mr. Higgins. I will concede a copy of that bulletin was received. It has a notation which I know is Mr. Higgins'. I don't know as to Mr. Ballot.

~~PLAINTIFF~~
For ~~Dr. S. Gregory~~—Direct

BY MR. SMART: Well, the bulletin bears a date.

BY MR. COHEN: It bears a date; in whose hand is not clear.

BY MR. SMART: It bears a date—

BY MR. COHEN: It bears two dates; one, September 14th; and one, September 7th.

By MR. SMART: Now, the exact date is not—

BY MR. COHEN: I think you will find the exact date a very immaterial fact.

BY MR. SMART: Well, for my present purposes, may I take
10 it that sometime during the year 1915 a document, Bulletin No. 2, was received in this office from Mr. Martin?

BY MR. COHEN: Yes.

BY MR. SMART: I will have that document marked as Defendant's Exhibit 3 on Discovery. (So marked.)

Q. 63.—And for the exact date in 1915, I shall have to ask Mr. Higgins? A.—Mr. Higgins, that's right.

BY MR. COHEN: I am willing to stipulate that Mr. Higgins received it on September 14, 1915.

By MR. SMART: All right. That's all right.

20 BY MR. COHEN: I am not willing to stipulate as to Mr. Ballot, because I really don't know.

BY MR. SMART: That's all right.

BY MR. SMART: Could I have Production 99; there is an index of those bulletins.

(Mr. Cohen hands document to Mr. Smart.)

BY MR. SMART: Now, this index which I have in my hand of these bulletins of R. B. Martin indicates that from 1915 to the beginning of 1926 some 88 bulletins were prepared by Martin and filed in this office; is that right?

30 BY MR. COHEN: That is what it indicates, yes. Do you want to introduce it?

BY MR. SMART: No; I am trying to avoid any unnecessary documents at this time. Then, your Productions 100 and 100A. Mr. Scott let me see copies.

BY MR. COHEN: What is 100A?

BY MR. SMART: It is an undated notebook of Martin.

BY MR. COHEN (handing two books to Mr. Smart): We call the larger of those two volumes the "recipe book."

40 Q. 64.—Your solicitors have produced what is now termed a "recipe book," in which, on the first 17 pages, there are certain entries made, the last one and the latest one being dated January 28, 1921. Am I correct in understanding that is a notebook of R. B. Martin which was left with the company when he ceased being employed by it?

~~For Plaintiff~~
 For ~~Plaintiff~~ Dr. S. Gregory—Direct

BY MR. COHEN: You are correct in so understanding it.

BY MR. SMART: I will ask that the reporter copy page 10 from that "recipe book" into the record.

(Page 10 of the "recipe book" reads as follows:

"Stanol

| | |
|---------------------------------|----------|
| "Denatured alcohol | 100 c.c. |
| "Carbon Disulphide..... | 100 "" |
| "Caustic soda (NaOH) | 100 gr. |
| "Digest under reflux condenser" | |

10 BY MR. SMART: There is not very much; I guess we'd better have the notebook marked as an exhibit.

Prints of every page on which there appears writing will be marked as Defendant's Exhibit 4 on Discovery. (So marked by commissioner.)

Q. 65.—I have here a letter of yours, Dr. Gregory, presumably addressed to Mr. Ballot, of the 28th of July, 1915, which contains the following dealing with Martin, — the first sentence:

20 "Reverting to the first page of your letter of 6th July, I have had a long discussion with Higgins, and send you here-with his report up to date which I think will satisfy your requirements. I am also sending you copies of Martin's inventions, which he gave Williams."

And a later part of the letter, which is dated July 30, 1915, and headed "R. B. MARTIN":

"Higgins' report is enclosed which brings this matter up to date. We shall have a conference next week with Williams and you will hear from me."

Am I correct in understanding from that letter that at that time you were in active discussion with Mr. Higgins and Mr. Williams about 30 these inventions of Mr. Martin? A.—Depends on what you mean by "active discussion." My "active discussion" would be: is there anything in it.

A. 66.—You received the report and decided what was to be done about it? A.—I received the report and sent it to where it should go.

Q. 67.—You say here: "I have had a long discussion"—

A.—My discussion was from the financial side, — whether there was any value or anything like that,—because I was not in a position—

40 Q. 68—I am not going to ask you to go into that. A.—To that extent, yes.

BY MR. SMART: Reference is made to a report of Mr. Higgins which was enclosed in that letter, and I don't seem to have had a copy of that report. Have you been able to find it?

PLAINTIFF

For ~~Dr. S. Gregory~~—Dr. S. Gregory—Direct

BY MR. COHEN: Look at No. 101.

BY MR. SMART: I will ask to have this letter marked as Defendant's Exhibit 5 on Discovery. The letter is dated July 28, 1915, and the note is dated July 30, 1915; two dates on it. (So marked by commissioner.)

BY MR. COHEN: I think that Higgins report is No. 101.

Q. 69.—You identify this letter, in any event, as your letter sent at that time? A.—Yes.

(Mr. Cohen hands Higgins report referred to, to Mr. Smart.)

10 Q. 70.—Can you identify this as being the report which was sent with that letter? A.—Yes.

BY MR. COHEN: It is understood, is it not, when Dr. Gregory is answering your questions asking identification of these documents, that he is answering on advice of counsel?

BY MR. SMART: Oh, yes; it is really an examination on discovery.

(Informal discussion off the record.)

BY MR. SMART: I will have the report marked as Defendant's Exhibit 6 on Discovery. (So marked.)

20 Q. 71.—This letter I am now producing of August 3, 1915, is a letter from you to Mr. Ballot of that date? A.—Yes.

BY MR. SMART: I will have this letter of August 3, 1915, marked as Defendant's Exhibit 7 on Discovery. (So marked.)

BY MR. COHEN: You don't mind having the relevant extract? Most of the letter has nothing to do with this.

BY MR. SMART: An extract is all right. I am not concerned with other affairs engaging your attention at that time.

BY MR. COHEN: And that also applies to the letter of July 28th, which is Exhibit 5?

30 BY MR. SMART: Yes.

Q. 72.—Then, I have here a letter of yours of August 26, 1915, to Mr. Ballot, in which you say:

“MARTIN'S INVENTIONS. I am sending you Higgins reports bringing this matter up to date.”

On the bottom there is a notation:

“(Higgins reports addressed HDW Aug. 21 and 24)”.

I wonder if you could locate those reports or if your counsel can?

BY MR. COHEN: I can produce a report dated August 14, 1915. Are you offering that, by the way?

40 BY MR. SMART: I read everything there was in it when I put the question, but I will have the letter marked as an exhibit if it is more convenient. I will have it marked as Defendant's Exhibit 8 on Discovery. (So marked.)

PLAINT
 For ~~Defendant~~—Dr. S. Gregory—Direct

BY MR. COHEN: An extract?

BY MR. SMART: There is not much more in the letter. You see, I want the stuff on the bottom. I think we had better have a copy of that letter. I don't think it will embarrass anyone at this time.

BY MR. COHEN: I can produce a report dated August 14th, but none dated August 24th, and I do herewith produce it. That is Production No. 102.

BY MR. SMART: I will have that report of August 14, 1915, 10 marked as Defendant's Exhibit 9 on Discovery. (So marked.)

Q. 73.—Then, there is a letter of September 17, 1915, from yourself to Mr. Ballot?

BY MR. COHEN: Yes.

BY MR. SMART: The relevant portions of which I will ask to have marked as Defendant's Exhibit 10 on Discovery. (So marked.)

Q. 74.—Then, there is a letter from Mr. Ballot to you of the 1st of October, 1915?

BY MR. COHEN: Yes.

BY MR. SMART: The relevant portion of which I will ask to 20 have marked as Defendant's Exhibit 11 on Discovery. (So marked.)

Q. 75.—Now, that letter refers to a portion of Martin's dated August 15th, which was enclosed with a letter of yours of August 17th. I don't think we have had that letter of August 17th.

BY MR. COHEN: I think that probably is a misprint in Mr. Ballot's letter. I think he meant the letter of Dr. Gregory to Mr. Ballot of August 18, 1915.

BY MR. SMART: Have you got that letter of August 18, 1915?

BY MR. COHEN: The production number is 126. (Hands letter to Mr. Smart.)

30 BY MR. SMART: I suggest to you that this reference to a "copy of his report dated 15th August" is to the Martin Bulletin No. 2, which is dated at that date, and which was received by Higgins on September 14th, according to the date in the notation; so that it was probably a copy of this bulletin, which is Exhibit 3, that was referred to there.

BY MR. COHEN: I will agree that probably that is the document.

Q. 76.—Then, on October 15, 1915, there is another letter from yourself to Mr. Ballot?

40 BY MR. COHEN: Yes.

BY MR. SMART: The relevant portions of which I will ask to have marked as Defendant's Exhibit 12 on Discovery. (So marked.)

Q. 77.—There is another letter of yours, dated October 22, 1915, to Mr. Ballot?

PLA:
For ████████—Dr. S. Gregory—Direct

BY MR. COHEN: Yes.

BY MR. SMART: I will have the relevant portion marked as Defendant's Exhibit 13 on Discovery. (So marked.)

BY MR. SMART: Now, could I see No. 139?

BY MR. COHEN: That we introduced this morning with Mr. Williams.

BY MR. SMART: I don't need to put it in again if it is in. Now, I don't know what we can do about these laboratory notebooks of Keller and Lewis of which you gave us photostat copies. I don't
10 suppose that Dr. Gregory will know about those?

BY MR. COHEN: He would not.

BY MR. SMART: I wonder if we could agree that those of which you furnished us copies would be made available just as if produced by a proper person on discovery?

BY MR. COHEN: Yes, we will. Suppose you specify the numbers.

BY MR. SMART: That is the productions numbered 135, 136, 137, and 138.

BY MR. COHEN: You are not including 133 and 134, which were Martin's laboratory notebooks and Smolen's laboratory note-
20 books?

BY MR. SMART: No, I am not. Now, there is No. 157; that is a letter —

BY MR. COHEN: Mr. Smart, in order to save us both time, I am perfectly willing to stipulate that every document referred to on our affidavit may be referred to by either party and offered in evidence by either party.

BY MR. SMART: As having been written by the person by whom it purports to have been written, on the date which appears on the document?

30 BY MR. COHEN: I don't know about the dates; for example —

BY MR. SMART: Where they are dated, I mean.

BY MR. COHEN: Yes. without the necessity, of course, to call the person.

BY MR. SMART. That would follow, of course, from the stipulation. That is all I have on that, subject to any question of relevancy of the documents that may arise.

BY MR. COHEN: Oh, yes. And subject, further, to contradiction by either party, upon evidence that the date which the document bears was not actually written on that day. I have specifically
40 in mind that some of Martin's bulletins are dated a considerable period before they were received by the Minerals Separation staff, and I should like to be free to offer evidence as to when they were received.

PLAINT
For ██████████—Dr. S. Gregory—Direct

BY MR. SMART: That is all right. And subject to the admission in regard to the Bulletin No. 2.

BY MR. COHEN: Yes. That is not an admission; that is a statement.

Q. 78.—Then, there are some things I want you to tell me, if you can, about some of the persons who are concerned with some of the later correspondence. In some of the later correspondence, there is a reference to Mr. Chester B. Allen; who was he?
A.—He was our secretary prior to Mr. Roberts.

10 Q. 79.—And Mr. Edward H. Nutter was your chief engineer?
A.—Yes.

Q. 80.—And who is Mr. J. V. Quigley? A.—Quigley? He used to be one of our field men, working out of the San Francisco office.

(Five-minute recess.)

Q. 81.—One or two little things: Mr. Gregory, it appears from this correspondence that in 1926 the Company became aware that potassium xanthate was being used by the Noranda Company; is that a matter that came within your knowledge, or don't you
20 know about that? A.—Yes, it came. From time to time I got information that they were using xanthate.

Q. 82.—Did you consult counsel about taking any proceedings? A.—I did consult counsel, but I would like to refer to our minutes of the meetings to give the dates and everything more particular.

BY MR. COHEN: You mean of the directors meetings, Dr. Gregory?

BY THE WITNESS: Yes.

Q. 83.—Perhaps you will do that, then.

BY MR. COHEN: We will do that. As a matter of fact, I
30 propose to offer, when my turn comes, extracts from the minutes of the directors meetings from the minute book here. These are the extracts.

BY MR. SMART: May I see it, please?

(Mr. Cohen hands papers to Mr. Smart.)

BY MR. SMART: Well, it was in 1926 that I referred to.

BY MR. COHEN (to the witness): Mr. Smart's question was if you had ever heard in 1926 that Noranda —

BY THE WITNESS: I wouldn't be sure. (To Mr. Roberts): Was it, Roberts?

40 BY MR. ROBERTS: I don't think they started their milling operations until a little later than that, if my memory serves me.

Q. 84.—Here is a letter of July 19, 1926; I think it is a letter of Mr. Roberts to Mr. Perry, President. I will read:

PLAINTIFF

For ~~██████████~~—Dr. S. Gregory—Direct

“I discussed with Dr. Gregory the talk which I had with you about the Rouyn matter which was discussed at the board meeting, but more explicitly the Noranda Mines which the Rockefeller interests had in Canada, and correspondence follows.”

I wonder if there is a notation in your book about that. Perhaps it would be simpler to go through the minutes for 1926 as you have done for 1936.

10 BY MR. COHEN: I think we have gone through the minutes considerably before that, but we didn't go back to 1926. I have this 1926 minute book, but it indicates that Noranda was not then treating its ores; it was just in the process of formation. I think Noranda wasn't put on a going basis until 1930.

Q. 85.—Then, there is a letter of August 22, 1930, to Mr. Nutter dealing with Noranda; perhaps there is something dealing with that in the minutes for 1930?

BY MR. COHEN: No, nothing.

BY MR. SMART: Have you been through the minutes from there through 1936?

20 BY MR. COHEN: No, I will do it now. — I have one entry here, Mr. Smart.

(After informal discussion, the hearing was adjourned to Wednesday, February 2, 1944, at 10:30 o'clock in the forenoon, at the same place.)

Met, pursuant to adjournment, at the office of Minerals Separation North American Corporation, No. 11 Broadway, New York City, New York, on Wednesday, February 2, 1944, at 10:30 o'clock in the forenoon, for the further examination of Dr. Seth Gregory on discovery.

30 APPEARANCES: Counsel as before, except Mr. Finlay.

(The stipulation entered into between counsel, which appears at typewritten pages 27 and 28 of this examination, was read by the reporter at the request of Mr. Cohen.)

BY MR. COHEN: I asked to have the stipulation read so that it shall be clear that the stipulation refers only to the documents mentioned in the plaintiff's affidavit and not the defendant's affidavit.

40 BY MR. SMART: Oh, yes. It includes the documents listed as 1 to 213 of the Schedule to Mr. Albert Roberts' affidavit of the 29th of November, 1943, including whatever substitutions and additions have been made subsequent to the date of the affidavit.

~~PLAINTIFF~~
For ~~Exhibit~~—Dr. S. Gregory—Direct

DIRECT-EXAMINATION BY MR. SMART — CONTINUED:

BY MR. SMART: You were to look through the minutes for 1930 to 1936. You found one in 1931.

BY MR. COHEN: I found one in 1931, which I think I might just as well read into the record.

BY MR. SMART: Yes, read it into the record.

BY MR. COHEN: This is from the minutes of the meeting of the Board of Directors, November 2, 1931:

10 “The question of the corporation’s attitude toward unlicensed users of xanthate was brought up, and the matter was left in the hands of the President and Vice-President to deal with as they thought fit.”

Now, that was the only reference that I found other than those on the sheet of paper which I gave you.

BY MR. SMART: Yes; then I can perhaps carry on from there.

Q. 86.—Then, as far as the minutes show, Dr. Gregory, there is no entry with regard to action to be taken against unlicensed use of the xanthate from 1931 until 1936? A.—We took no action, that’s right.

20 Q. 87.—Nor is there anything recorded in the minutes? A.—Not so far as I know.

BY MR. COHEN (to the witness): You took no action as far as Noranda is concerned?

BY THE WITNESS: Yes.

Q. 88.—During that period you obtained some Canadian licenses? A.—That’s right.

Q. 89.—Can you give me the names of those?
(Informal discussion off the record.)

30 BY MR. SMART: It is understood that there will be a list of licensees in Canada with the date on which they became licensees marked as Defendant’s Exhibit 14 on Discovery. (So marked.)

BY MR. COHEN: From what date?

BY MR. SMART: From the date of the xanthate patent, — the Keller patent in suit.

BY MR. COHEN: Is it all right if Mr. Roberts adds to that the tonnages produced by each?

BY MR. SMART: Yes.

Q. 90.—I suppose all of those licenses were more or less a common form? A.—Yes, they are all the same.

40 Q. 91.—Will you give me a printed copy of the form of license? A.—Yes.

BY MR. SMART: I will ask to have that marked as Defendant’s Exhibit 15 on Discovery. (So marked.)

For ~~Defendant~~—Dr. S. Gregory—Direct

Q. 92.—Then, Dr. Gregory, Mr. Cohen has handed me excerpts from the minutes in the years 1936, 1937, 1938, 1940, 1942, and 1943, which I will ask to have marked as Defendant's Exhibit 16 on Discovery; and I understand these are all the minutes in those years. A.—Yes. On that subject?

Q. 93.—On that subject, yes. A.—Yes.

(Defendant's Exhibit 16 on Discovery marked by the commissioner.)

Q. 94.—I notice under May 20, 1936, that you consulted our
10 learned friend, Mr. Scott, as Canadian counsel; had you consulted any Canadian counsel before that date? A.—No.

Q. 95.—May I take it that these minutes and the correspondence which is included in the productions together show the course of action with regard to the unlicensed use in Canada during the period covered by the minutes and the correspondence? A.—Well, to a qualified degree, you see, because we did try a lot of side things to find out who were doing it. The business aspect of it, too—

Q. 96.—Had to be considered? A.—Yes.

Q. 97.—You have, I think, produced all of the correspondence
20 with licensees, not with unlicensed users?

BY MR. COHEN: If I understand your question to ask is that all that was done in the way of putting ourselves in contact with licensees, the answer is no.

Q. 98.—Yes. During that period, your field representative was up in Canada and around the mines from time to time? A.—Yes, from time to time; and we had discussions as to why and wherefore we didn't proceed any further and that sort of thing. As far as that goes, it is correct; but I wouldn't like to say that is entirely the only thing. I mean those are bare skeleton facts, you see what I mean, and
30 the thing it culminates in was we had a lawyer like Mr. Scott to look into it, and finally we took action. But, from those minutes, you see, you wouldn't get that thought at all, would you?

Q. 99.—No; but there was quite a gap between 1931 and 1936. A.—The probability is we hadn't any information as to whether anything was going on or not. It is very difficult to get that information. For instance, now, you take the Noranda: one time they were using it; another time they weren't using it. You see? It's hard to tell. They don't give you information, you know.

Q. 100.—Well, the correspondence shows you had a good deal
40 of correspondence. A.—Sure; but that is all, as I say, on the offchance that we were right. It's very difficult to find out infringers,—to find out exactly what they are doing. When we were finally convinced of the fact, you see, then we discovered that the principal infringers were those that were—I won't say in but with the Noranda group; and it was no use talking to them—they said: "You get Noranda and then we'll talk to you."

PLAINTIFF

For ~~Dr. S. Gregory~~—Dr. S. Gregory—Direct

Q. 101.—There was no difficulty in ascertaining what Noranda was doing in 1930? I see that Mr. Quigley visited them there and got samples of their ores and reported on the use of amyl xanthate.
A.—Yes.

Q. 102.—So evidently in 1930 you knew what they were doing?
BY MR. COHEN: What letter are you referring to, Mr. Smart?

BY MR. SMART: The letter of August 2nd to Mr. Nutter from J. V. Quigley. A.—Yes.

Q. 103.—And then Mr. Allen had a long visit, which is described
10 in the letter of March 3, 1932? A.—Yes.

Q. 104.—So that in 1932 you knew what they were doing; and in 1934 there is a letter to you from Mr. Perry— A.—Yes.

Q. 105.—Showing knowledge. A.—That's right.

BY MR. COHEN: What date in 1934?

BY MR. SMART: October 28, 1934.

Q. 106.—Now, is there anything to indicate that, in any of the intervening years, you had any information that Noranda was not using xanthate? A.—Doesn't it appear in one of the minutes there?

BY MR. SMART: Not that I had my attention called to.

20 BY MR. COHEN: Yes; on the second page of the minutes (Exhibit 16), it says something of the sort,—that Noranda has again started using xanthate.

BY MR. SMART: The 1937 minute—October 28, 1937? I am asking if there was anything—

BY THE WITNESS: The assumption was that they had stopped and we had been told.

Q. 107.—I am asking if there is anything, apart from correspondence or reports, that indicated Noranda had stopped using it.

BY THE WITNESS: There isn't, is there, Mr. Cohen?

30 BY MR. COHEN: There is one letter, if I may remind Dr. Gregory of it, that Mr. Murdock wrote. A.—I believe Mr. Perry saw Mr. Murdock.

BY THE WITNESS (to Mr. Roberts): You saw Mr. Murdock with Mr. Perry?

Q. 108.—Yes; well, Mr. Perry reports that Mr. Roberts had told of the interview with Mr. Murdock. A.—Didn't Mr. Perry see him?

Q. 109.—Yes; together; that's what the letter indicates. A.—That's quite right.

40 BY MR. COHEN: November 2, 1934, Mr. Murdock wrote to Mr. Roberts. It is one of the letters you produced, and we simply said we had the original, yours being the carbon.

BY MR. SMART: May I see that?

BY MR. COHEN: The thing I have reference to is the phrase:

PLAINTIFF

For ~~Defendant~~—Dr. S. Gregory—Direct

“We concentrated approximately 3,000 tons of ore and I understand that the xanthate cost when we use it is somewhere around 3c. per ton.”

Q.110.—Just to clear it up; there is no report or letter on your file from anybody connected with your organization to the effect that Noranda had discontinued using xanthate? A.—Well, I don't see how I could have had that on the minutes without we did get it, Mr. Smart, because I—

Q. 111.—I am not asking you to speculate; I just want to clear up the situation as far as documents are concerned.

BY MR. COHEN: We concede there is no written report in the minutes to that effect,—not that we know of. A.—Not that we know of.

Q. 112.—Your counsel and I can infer what we will from the language of the minutes.— A.—I know. I am trying to explain my position. I don't like to say—I am just clearing my position.

Q. 113.—Well, can you remember any person specifically who reported so to you?

BY MR. COHEN: We will make a search of our records and the reports of our field representatives, and will endeavor to find out whether there is such a written report. At the present moment, we do not know of any; but, if there is, we will attach it.

Q. 114.—Who were the field representatives in Canada? A.—We haven't any special representatives in Canada. Our field representatives went all over the United States and Canada.

Q. 115.—And how many of them were there? I have got the names of some of them; weren't they field representatives?

BY THE WITNESS (to Mr. Roberts): Who were they?

BY MR. ROBERTS: J. V. Quigley and Chester B. Allen; later on, C. F. Williams; and there may have been some others on occasions when they were not there or not available or otherwise occupied. A.—Those were the regular ones, anyhow.

Q. 116.—In addition to visiting the mines, I suppose these representatives attended the annual meetings of the mining associations in Canada generally? A.—That I couldn't tell you.

BY THE WITNESS (to Mr. Roberts): Is that so?

BY MR. ROBERTS: I don't think so. I attended them, but I don't think they did.

BY MR. SMART: When did Mr. Roberts go?

BY MR. ROBERTS: The last meeting I went to was in 1919, 1920, or 1921.

BY MR. SMART: Photostat of Production 10 has been furnished me, and I presume we can take it this is Mr. Higgins' copy of the specification?

PLANNED
 For ~~Examination~~—Dr. S. Gregory—Direct
 For ~~Examination~~—Dr. S. Gregory—Cross-Examination

BY MR. COHEN: Those notes are in Mr. Higgins' handwriting.

BY MR. SMART: This is Production 10. It is Mr. Higgins' copy of the Martin specifications with notations in the handwriting of Mr. Higgins. Then, there is a Production 50, Bulletin No. 40. I can get Mr. Scott to give me a photostat of page 23 of Production 50, because Mr. Scott has his copies marked.

BY MR. COHEN: Yes.

BY MR. SMART: I will get copies of Productions 139 and 147?

BY MR. SCOTT: You will get them as soon as I get back.

10 BY MR. SMART: With the arrangements we have made as to these documents, I think that covers it.

CROSS-EXAMINATION BY MR. COHEN:

XQ. 117.—Doctor, you said something on your direct about exchange of information between the London company and the American company; what was the practice of the American company and the London company in that respect? A.—Well, for argument's sake, we will call it "X". We started to find out about a new invention; then we would go on and on until we had perfected it; then, after we had put in our patents, we passed the information on to the other
 20 party for them to either take patents out or, if they didn't think it of any value, just leave it alone.

XQ. 118.—It was not your practice to communicate your information before the filling of applications for patents? A.—Oh, no, I should say not.

XQ. 119.—Why not? A.—Why, we always kept everything secret until we were fixed up—until we knew whether we had something or not. You know, out of about ten things we go into—even more—twenty or more, one may turn out of any consequence to pursue. If we did that, we would have no end of work to do, as well as give
 30 information out which we shouldn't.

XQ. 120.—That was your practice in 1915 and thereafter? A.—Practically all the way through.

XQ. 121.—You testified, Dr. Gregory, that in 1915 Mr. Ballot was president of the American company,—that is, Minerals Separation American Syndicate (1913) Limited,—and that you were vice-chairman? A.—Yes.

XQ. 122.—That is, Mr. Ballot was chairman and you were vice-chairman? A.—Yes.

XQ. 123.—What was the division of functions between you?
 40 A.—As far as I was concerned, at that time I was looking after the litigation, which was extensive. We had litigation in Baltimore, and we had a Supreme Court case coming along. Mr. Ballot had the whole thing in his own hands in the office—all the details of the work.

PLAINTIFF
 For ~~Dr. S. Gregory~~—Dr. S. Gregory—Cross-Examination

XQ. 124.—Did you have any hand in the arrangements with Martin? A.—No. I never saw Martin, as far as I can remember, until everything was fixed up. And then I saw him on special occasions. We used to have occasion to make demonstrations in court, and Martin was one of the men that, under Mr. Higgins, conducted the demonstrations. That's the time I would see him.

XQ. 125.—That is the only place you remember meeting Mr. Martin? A.—Yes.

XQ. 126.—How did it happen you wanted Higgins to negotiate
 10 with Martin? A.—Mr. Ballot had anemia and was away.

XQ. 127.—That was in March, 1915? A.—Yes.

XQ. 128.—What did Mr. Ballot do after his recovery from his illness? A.—I think he went back to England.

XQ. 129.—And he stayed away some time, didn't he? A.—Yes.

XQ. 130.—He stayed away long enough for you to have that correspondence with him? A.—Yes.

XQ. 131.—Mr. Smart has introduced in evidence some of the correspondence that passed between you; although under the stipulation this isn't necessary, I should like to complete the record by
 20 introducing the following letters; and I show you these letters:

The first is dated July 6, 1915, from Mr. Ballot to you;

The second is dated July 20, 1915, from Mr. Ballot to you;

The third is dated July 22, 1915, from you to Mr. Ballot, enclosing a letter from Mr. Higgins to you dated July 21, 1915;

The fourth is dated August 10, 1915, and is from Mr. Ballot to you;

The fifth is dated August 31, 1915, and is from Mr. Ballot to you.
 A.—Yes.

BY MR. COHEN: I offer those letters in evidence as Plaintiff's
 30 Exhibits on Production 17 to 21. (So marked.)

XQ. 132.—Do you remember reading Martin's patent specifications enclosed in a letter to you of March 19, 1915? A.—No.

XQ. 133.—Do you remember reading any of his bulletins? A.—No. I already told Mr. Smart that I didn't.

XQ. 134.—That you didn't remember or you didn't read them? A.—I don't remember and didn't read them both.

XQ. 135.—Why didn't you read them? A.—Waste of time. I wouldn't understand a thing about them. Just a waste of time.

XQ. 136.—What did you do with them? A.—Passed them on
 40 to Higgins and Williams. Williams handled it.

XQ. 137.—Your letter also shows you sent Higgins' report to Mr. Ballot. A.—Surely. It was a business between them. I had nothing to do with it, except to be the intermediary in passing on these things.

PLAINTIFF
 For ~~Dr. S. Gregory~~—Dr. S. Gregory—Cross-Examination

XQ. 138.—You have subsequently heard of Bulletin No. 2, have you not? A.—I have heard of it, but I don't know anything about it now even; it's too complicated to me.

XQ. 139.—Did you direct anybody to send a copy of that to San Francisco? A.—No, certainly not.

XQ. 140.—You didn't do it yourself, did you? A.—The only one that would have the right to, and I doubt if he would, was Mr. Ballot. It was his business.

XQ. 141.—When was the first time you heard of xanthate?
 10 A.—The first time I heard the name of xanthate was the time when this Keller and Martin thing came up.

XQ. 142.—When did you first hear Martin make claim to the discovery of the use of xanthate? A.—I can't exactly fix the date. The only way I can fix the date is by his going to San Francisco. It was a few weeks before he went to San Francisco.

XQ. 143.—If I told you he went to San Francisco in January, 1926, does that refresh your recollection as to when you first heard it? A.—It must have been sometime in December or November of the previous year. He came to me and he asked me for a raise, and I
 20 said to him: "Mr. Martin, you have been with us so many years and you haven't produced anything that has brought us any income; I don't see any justification for recommending the board to give you a raise." And that's the first time I heard him say, "I invented that xanthate." Well, of course, it came to me as a shock, because I had never heard of it before, and I said, "Well, I am surprised to hear of it." And I said, "Why didn't you let me know about it before Mr. Higgins left?" or "Why didn't you speak to Mr. Higgins earlier?"—because he was working under Mr. Higgins and Mr. Higgins knew
 30 Higgins had left. So he left that and talked about going to California as the proper place to carry on experiments and bring the inventions to fruition; and finally he said he would like to go and asked for, I think, a thousand dollars to go to California to carry out experiments there. Well, he didn't do anything there except go there and come back. I think he had some private reasons for going there, which I needn't go into because that is only hearsay. That's all.

XQ. 144.—But you advanced the thousand dollars? A.—Oh, yes; we gave him the thousand dollars. He went there and came back, and then we had his resignation soon afterwards.

40 XQ. 145.—His resignation was in June, 1926? A.—Yes.

XQ. 146.—Has Minerals Separation North American Corporation or its predecessor, Minerals Separation American Syndicate (1913) Limited, ever discharged an employee who worked in its laboratories? A.—No; that is a dangerous thing.

PLAINT :
For ~~Defendant~~—Dr. S. Gregory—Cross-Examination

XQ. 147.—You closed a laboratory recently? A.—Yes, we closed it in California, but we pensioned off—or rather gave them all recompense for leaving us.

XQ. 148.—That is, all the employees whose connections were severed? A.—All of them.

XQ. 149.—You have been asked about your efforts in the direction of Noranda; and there has been produced here a file of correspondence between Mr. Roberts and Mr. Boyd on the one hand and Mr. Murdoch and his secretary on the other. That correspondence
10 ended in 1936. Did you thereafter make any attempt to put yourself personally in touch with Mr. Murdoch? A.—Well, I have a business associate here—mutual friends, may I call it, in business. It was Mr. Elkan, of International Minerals & Metals Corporation,—he is the president of that; and he was very friendly with Mr. Bennett, who is president of a subsidiary of Phelps Dodge; and he got Mr. Bennett to see Mr. Murdoch and ask Mr. Murdoch to meet me at his convenience. Efforts were made, but it never came to anything.

XQ. 150.—Now, the job of determining what steps to take thereafter, according to the minutes of the board of directors, was
20 left to you? A.—Yes.

XQ. 151.—What did you do? A.—I recommended, and they followed my recommendation, that they should not do anything.

XQ. 152.—Why? A.—Until the patent expired or even very near expiring, because—there were two reasons. One of them was this: the tonnage that we would gain by fighting with Mr. Murdoch's corporation was a small fraction of what was coming to us from other directions, and—I may have been wrong or I may have been right, I don't know which it was, but I thought it would disturb our relationship with the licensees that were paying and they might very well
30 have said, "Well, since this fight is on, we will stop paying or do something until it is decided who wins and who loses." See?

BY MR. COHEN: Yes.

(Witness continues): I didn't want that to arise; but, in addition to that, we had a large amount of tonnage being treated in the United States, and all our licensees were paying us, even the Anaconda and the Utah, notwithstanding the decision of the court in San Francisco. Right to the very end of the termination of the xanthate patent, they were paying us royalties.

XQ. 153.—And your point is that you did not want to disturb
40 that relation? A.—I did not want to disturb that relation. That was one reason, you see. That is a pretty good reason as a business proposition, too. I may have been wrong and I may have been right, but my board said: "All right, if you think so, let it be so."

BY THE WITNESS (to Mr. Scott): Then, when the time came, I approached you a second time, Mr. Scott.

BY MR. SCOTT: Yes.

PLAINTIFF
 For ~~Defendant~~—Dr. S. Gregory—Cross-Examination
 Letters re Commission Evidence

BY THE WITNESS (To Mr. Cohen): Have I answered your question?

BY MR. COHEN: Yes, you have answered it very well.

BY MR. COHEN: Mr. Smart, you asked Dr. Gregory yesterday if he would supply you a list of the employees of the American company in 1915. I assume you don't want that any more?

BY MR. SMART: No; the reason for that has disappeared.

BY MR. COHEN: I have no further questions.

BY MR. SMART: I have nothing.

10 (Informal discussion off the record.)

BY MR. SMART: It is agreed that typewritten copies may be furnished of any documents and returned in place of photostats, with the understanding that the originals be produced at the trial. It is understood that the originals of all the documents referred to in these examinations will be produced at the trial.

BY MR. COHEN: Yes.

EXAMINATION CLOSED (11.40 A.M.)

PARAGRAPH 2 FROM LETTER OF MARCH 11TH, 1944,
 FROM R. S. SMART TO EWART, SCOTT & COMPANY.

20 "It would be sufficient for my purpose to have an agreement that this Bulletin (Martin No. 2) was received by Mr. Ballot during the year 1915, but I think Mr. Cohen stated that he was prepared to admit that it was received by Mr. Ballot some time during the month of October, 1915. The reporter may not have taken this down in view of the amount of conversation that was proceeding at that time. In any event I should be glad to know whether you will make this admission. If it is made, I should be glad to agree that Dr. Gregory's evidence should be put in as part of your case."

Letters re Commission Evidence
Opening Remarks of Counsel

Russel S. Smart, Esq., K.C.,
Messrs. Smart and Biggar,
Barristers and Solicitors,
Victoria Building,
Ottawa, Ontario.

Blackburn Building,
Ottawa, Canada.

March 18th, 1944,
A. 2474

Dear Sir:—

Re: Minerals Separation v. Noranda Mines

Referring to the 2nd paragraph of your letter of the 11th instant we are now instructed to say that we are willing to stipulate
10 that Mr. Ballot, who was in London in the latter half of 1915, was sent a copy of Bulletin No. 2 after its receipt by Mr. Higgins on September 14, 1915, probably in Dr. Gregory's letter to him of September 17, 1915 (defendant's exhibit on discovery No. 10) and that Mr. Ballot did not receive any copy of Bulletin No. 2 at any earlier time.

Yours truly,

(sgd.) Ewart, Scott, Kelley, Scott & Howard

HIS LORDSHIP: Am I to understand that that completes the evidence for plaintiff at this stage?

20 MR. GOWLING: Yes, my Lord.

HIS LORDSHIP: I notice that the rule requires the plaintiff at the conclusion of his evidence to sum up.

MR. GOWLING: I would prefer, my Lord, to leave the summing up until after hearing the defence. That is a practice which I think has been adopted in this type of case.

HIS LORDSHIP: Notwithstanding the rule?

MR. GOWLING: Yes, my Lord. One reason for it is that we have found a rather full opening statement explains the nature of the case which will be presented by the plaintiff. I think that
30 during the course of the plaintiff's evidence your Lordship and my friends will have clearly seen what our case is. To repeat at this stage what I said in opening would be unnecessary. Our patent is prima facie valid, and my feeling is that it would save time and probably throw much more light on the case if I could defer my summing up until the defendant's case is in.

HIS LORDSHIP: And until you have put in any rebuttal that you may wish to put in?

MR. GOWLING: Yes, my Lord. So I would ask leave of the court to follow that practice.

40 HIS LORDSHIP: That is permissible, is it not?

MR. BIGGAR: I see no objection to it, my Lord, if your Lordship is agreeable.

Opening Remarks of Counsel

HIS LORDSHIP: I wonder what the purpose of the rule was.

MR. BIGGAR: The purpose of the rule was really to introduce the English practice. In England the plaintiff's counsel always sums up when he closes his case. Then the case is opened on behalf of the defendant, and the defendant closes.

HIS LORDSHIP: Then is there an argument in addition to that?

MR. BIGGAR: Not of the kind we are used to. After the defendant has closed, the only further speech by the plaintiff is a reply.

10 HIS LORDSHIP: Then is there any further argument after that?

MR. BIGGAR: No, my Lord. That ends it. But the practice here has been to omit the summing up after the closing of the plaintiff's case.

HIS LORDSHIP: And likewise after the closing of the defendant's case.

MR. BIGGAR: Yes. Our practice has been to have the plaintiff's rebuttal, if there is any, at the end of the defendant's evidence, and then argument by the plaintiff, followed by the defendant's argument and finally by a reply by the plaintiff.

20 HIS LORDSHIP: That applies to patent cases the procedure followed in other cases, except with regard to opening.

MR. BIGGAR: Yes, my Lord.

HIS LORDSHIP: I see no reason, if counsel agree, why we should not follow the course suggested by Mr. Gowling.

MR. GOWLING: Thank you, my Lord.

MR. BIGGAR: There are two points, my Lord, with regard to what my friend has said. There is included in the evidence given in chief by the plaintiff's witnesses on the commission, and perhaps also in the cross-examination, some evidence that in my submission
30 is clearly irrelevant, pure hearsay.

HIS LORDSHIP: I suppose on all the commission evidence there is a reservation as to the admissibility or otherwise of evidence?

MR. GOWLING: Yes. I am sure that was understood, my Lord. I was not present at the taking of the commission evidence, but I am sure that understanding prevailed.

MR. BIGGAR: As a matter of fact, that is particularly so in this court, my Lord, having regard to the rule under which commission evidence is taken. That is Rule 169. As has been indicated earlier in the trial, this rule involves a special procedure, because it authorizes
40 the Court or a Judge to permit evidence to be taken before a Commissioner; and then it goes on: "and may empower any party to any such cause or matter to give such deposition in evidence therein on such terms if any as the Court or a Judge may direct."

HIS LORDSHIP: I would take it that—

Opening Remarks of Counsel

MR. BIGGAR: So that there is no purpose or necessity with regard to evidence taken on commission to continue to object to any evidence because when the evidence is offered at the trial, when it first becomes a part of the record, it is admissible only to the extent that it is permitted to be by the Judge.

HIS LORDSHIP: I would take it that it does not become a part of the record of the case until it has been introduced at the trial.

MR. BIGGAR: That is so.

MR. GOWLING: Yes, my Lord; I quite understand—

10 HIS LORDSHIP: Then, of course, counsel have the right to object to any portion of it on the ground of its inadmissibility.

MR. BIGGAR: The other remark that I think I ought to make at this time is a comment on my friend's statement that part of the evidence is evidence in reply and not appropriate to be read at this moment. Of course, my friend has got to select whether he is going to use it or not.

HIS LORDSHIP: I understand it is all in.

MR. BIGGAR: It is all in, yes, my Lord.

HIS LORDSHIP: I understand it is all in.

20 MR. GOWLING: Yes, my Lord.

HIS LORDSHIP: My question to Mr. Gowling was directed to the difficulty. If the witness had been here he would have been in the position of having to tender his evidence in open and would have been held to evidence that is strictly rebuttal on his reply.

MR. BIGGAR: Quite so, but having taken it as he does—

HIS LORDSHIP: It is all in.

MR. BIGGAR: It is all in.

30 HIS LORDSHIP: And that part of it which relates to the opening is in and that part of it which relates to the reply is in. If some of it is not in answer to anything raised in the defence what is the position of it then?

MR. BIGGAR: That is the difficulty. I do not know.

MR. GOWLING: That is the chance we take. There is some doubt in my mind. I am of the opinion that the evidence is in whether we want it in or not. I fully realize the position that it may not be in until you ask to put it in.

40 HIS LORDSHIP: I have wondered myself whether it is all in. You take the evidence regardless of whether it is opening or reply. If at the trial, for example, Martin were not called by way of the defence then what happens to all the evidence that is taken on commission relating to what Martin might say?

MR. GOWLING: It is sitting there but it is meaningless.

MR. BIGGAR: It is all in. It has got to be taken into account.

Opening Remarks of Counsel

MR. GOWLING: My friends can use the evidence we take if they wish to. Once it is before the court—

HIS LORDSHIP: That is what bothers me in regard to it.

MR. GOWLING: It is a troublesome point. I think the way we have handled it it has been largely an understanding between my friend's firm and our own. We have always come here knowing that either side could make objections to the evidence on the ground that it was hearsay and inadmissible. The same thing prevails here.

HIS LORDSHIP: Suppose, for example, by way of illustration,
10 Martin is not called. Is the court not really required under those circumstances to eliminate from the record evidence relating to what Martin might say?

MR. GOWLING: Yes, my Lord, except in this case—

HIS LORDSHIP: I am not clear on that.

MR. GOWLING: I may say my friends can prove part of their Martin case, and perhaps the whole Martin case, on documentary evidence, so that I really do not think that problem will arise.

HIS LORDSHIP: I am just taking that as an illustration.

MR. GOWLING: That is a perfect illustration except in this case
20 by reason of the fact we have been facilitating each other on proving certain facts. I have no doubt my friends can introduce their case on Martin without too much difficulty. Most of the evidence will be relevant and what is inadmissible your Lordship would have the privilege of striking out if you see fit.

HIS LORDSHIP: If it were a jury it would be a different matter.

MR. GOWLING: It would be a different matter.

HIS LORDSHIP: Then, Mr. Biggar, do I understand that you now make your opening?

MR. BIGGAR: If your Lordship pleases; it may make it easier
30 for your Lordship to understand.

HIS LORDSHIP: I think it would.

MR. BIGGAR: It has another advantage that my friend will know what he has got to meet when he comes to his part of the case later.

HIS LORDSHIP: I think it would be better then if you will.

MR. BIGGAR: Very well.

HIS LORDSHIP: Then I am to understand, Mr. Gowling, you have closed the plaintiff's case?

MR. GOWLING: The plaintiff's case is closed, my Lord.

40 HIS LORDSHIP: His main case. All right, Mr. Biggar.

Opening Remarks of Counsel

DEFENCE

MR. BIGGAR: My Lord, I think it would be useful that I should refer in the course of my opening not only to the exhibits which have been put in by my friend with reference to the commission but also to some which have been produced by the plaintiff and which it is agreed that they may go in without any witness to prove them.

HIS LORDSHIP: I wonder whether it might not be a good thing that they be put in at this stage and receive numbers.

MR. BIGGAR: I think that would be useful.

HIS LORDSHIP: If you are going to refer to them in your opening.

10 MR. BIGGAR: The position is there were three affidavits on production made on the part of the plaintiff and a large number of exhibits, some 275, were produced. A great many of those are referred to in the commission evidence. The arrangement that was made before the trial was that we should put in such of them as had not been already referred to in evidence, such of those produced documents as had not already been referred to in evidence. What I would suggest is that if we can give a list of those to my friend now perhaps he can have them ready and we can simply mark them in the course of my opening. They can be handed to the registrar and
20 marked consecutively. They will be in order of date.

With your Lordship's permission I was going to begin my opening with some of the legal principles which I do not think are in doubt and are repeated again and again even in the House of Lords but which it is always so difficult to keep in mind, particularly on one of the three points.

HIS LORDSHIP: That would be very helpful to me.

MR. BIGGAR: I was going to direct what I had to say to three main classes of different sizes.

HIS LORDSHIP: Three main what?

30 MR. BIGGAR: Classes of defence. The first I was going to deal with may be stated thus, that granted that this patent was properly issued the specification is one which, having regard both to its contents and what was omitted from them, is such as cannot support a valid patent.

The second is that there was no authority in the Commissioner of Patents to issue this patent at all.

The third is that there is nothing in the way of information contained in this specification which was not contained in a document eight years earlier, and made available to the public at that time.

40 HIS LORDSHIP: That is one particular document?

MR. BIGGAR: One particular document, my Lord, which contains all the information in our submission that is contained in Keller's specification.

Opening Remarks of Counsel

HIS LORDSHIP: That defence is called upon.

MR. BIGGAR: Call it anticipation, if you like.

HIS LORDSHIP: That is what is called anticipation.

MR. BIGGAR: Conveniently called anticipation. My friend has referred your Lordship to the Statute of 1935 but the difficulty with that is that is not the statute which applies. This patent was applied for and issued while the statutes of 1923 was in force.

HIS LORDSHIP: The statute of 1923 applies.

MR. BIGGAR: As a matter of fact, there was really no change
10 in the revision of 1927, and I think no significant amendment until
1932. The 1927 Act is just as good as the 1923. There was one
amendment; they left out one provision in it, but for practical
purposes we can take the 1927 Act. I have got a copy of that for
your Lordship in pamphlet form.

HIS LORDSHIP: I should like to have that.

MR. BIGGAR: I am dealing with the specification point first,
my Lord, the sufficiency of the specification generally to support
a patent.

HIS LORDSHIP: Yes.

MR. BIGGAR: And the section to which I would direct your
20 Lordship's attention is section 14 of that statute. It is rather
interestingly expressed, my Lord. It is sub-section 1.

“14(1) The specification shall (a) correctly and fully
describe the invention and its operation or use as contemplated
by the inventor; (b) set forth clearly the various steps in a
process, or the method of constructing, making or compounding,
a machine, manufacture, or composition of matter; (c) end
with a claim or claims stating distinctly the things or combina-
30 tions which the applicant regards as new and in which he claims
an exclusive property and privilege.”

Your Lordship will observe that really specifies three parts or
three separate kinds of statements in a specification. The first is
that it shall correctly and fully describe the invention. The second,
to complete it, is that it shall correctly and fully describe the operation
and use of the invention.

HIS LORDSHIP: Operation or use.

MR. BIGGAR: Operation or use of the invention as contemplated
by the inventor. These words are not without significance. Finally
it must contain claims. You see it says it must end with claims.

40 HIS LORDSHIP: Setting forth the various steps.

MR. BIGGAR: That is simply an explanation of the second part
of the first sentence really.

HIS LORDSHIP: Really relating to the operation or use.

Opening Remarks of Counsel

MR. BIGGAR: Yes, exactly. I think really all the law and the prophets is contained in the first and last sentence of that subsection.

There have only been two cases in Canada where serious questions arose on the specification.

HIS LORDSHIP: Only two?

MR. BIGGAR: I think there are only two. I know of no others.

HIS LORDSHIP: That is where—

MR. BIGGAR: Where there was a real question on the adequacy of the specification.

10 HIS LORDSHIP: Or the sufficiency of the description contained in it.

MR. BIGGAR: The description of the invention or description of the operation. Of course, there have been lots on the claims but I am now speaking of the specification as a whole. Perhaps it would be convenient to refer to that description as disclosure of the invention and its operation and use.

HIS LORDSHIP: That is subsections (a) and (b) of section 14 relate to the disclosure portion of the specification and subsection (c) is dealing with the claims portion.

20 MR. BIGGAR: Exactly. The first of those two cases is *De Forest*— I need not give your Lordship the rest of the name of the company— v. *Famous Players* in 1931 Exchequer Court at page 27. Your Lordship's predecessor, Mr. Justice Maclean, dealt almost as classically with the requirement of the specification as he did earlier with regard to the anticipation, which I shall have occasion to refer your Lordship to. It is a little long but I think it is so comprehensive — it will require some analysis—that I might read all of it to your Lordship that has any relevancy. It starts at page 42, covers page
30 43 and runs over into page 44, although there is quite a bit on page 43 that I need not trouble your Lordship with because that was one where workmen were in question and we can leave that out. He says at the bottom of page 42:

40 “This might be a convenient stage at which to state briefly the legal principles that have been laid down, and generally accepted, relative to the construction of the specification of a patent. The specification must ‘clearly and fully describe the invention and its operation or use as contemplated by the inventor’ and it must ‘set forth clearly the various steps in. . . . the method of constructing the machine, manufacture, etc.’ This was an obligation of the Common Law and it is now an obligation by Statute.”

I wonder if your Lordship might not like copies of these books to look at contemporaneously. Perhaps we can get the Exchequer Court report at once.

HIS LORDSHIP: It is right in my room.

Opening Remarks of Counsel

MR. BIGGAR: It is 1931 Exchequer Court Reports. Shall I go on?

HIS LORDSHIP: You may go on.

MR. BIGGAR:

"This was an obligation of the Common Law and it is now an obligation by Statute. If the specification uses language which when fairly read."—I am at the top of page 43, about the eighth or ninth line down. I began at the beginning of the paragraph at the bottom of page 42, my Lord.

10 "If the specification uses language which when fairly read, is avoidably obscure or ambiguous, the patent is void, whether the defect be due to design, or to carelessness, or to want of skill; nothing can excuse the use of ambiguous language when simple language may easily be employed, due allowance of course, being made where the invention is difficult to explain and there is a resulting difficulty in the language. If the term of a specification are so ambiguous that its proper construction must always remain a matter of doubt, it is the duty of the Court to declare the patent void."

20 There are two sentences, my Lord, which are not directly relevant here but perhaps your Lordship would like to cast your eye over them. I need not take the time to read them aloud. It is about whom the specification is addressed to. I accept it, of course but it is not of particular significance here.

HIS LORDSHIP: It might be difficult to understand for an ordinary person.

MR. BIGGAR: This specification is not addressed to a workman; it is addressed to metallurgists. I begin about eight lines before the end of the page.

30 "A specification also is bad, if it contains statements calculated to mislead the persons to whom it is addressed, or if it renders it difficult for them without trial and experiment to comprehend in what manner he patentee intends his invention to be performed. If a person of skill is to come in, and by means of his skill and experience without experiment is to correct mistakes or supply important omissions in a specification, or decides that the directions of the specification are not to be followed, then the specification is bad because it has not in reality given any useful or valuable information to the public."

40 HIS LORDSHIP: It might have been better to have said not given accurate information.

MR. BIGGAR: Exactly. That is why I am going on to develop this a little because it does require some sharpening.

HIS LORDSHIP: Probably it is not strictly correct to say it does not give useful or valuable information. It might have been more correct to say "accurate information."

Opening Remarks of Counsel

MR. BIGGAR: Yes.

10 “Further, if a specification describes two things, one practicable and the other impracticable, or if it directs two alternative ways of constructing or using an invention and one is impracticable or useless, the patent is bad, and if a skilled workman would know the impracticable thing or the useless alternative which could not be acted upon, and so would confine himself to the other, that would not warrant giving effect to the specification, because that would not be to construe a specification according to the language of the workman instead of according to our ordinary language, but to reject something claimed by the patentee, because a workman would know that it was an impractical direction or claim. The patentee must make it perfectly clear what it is he claims as his monopoly;”

HIS LORDSHIP: Now you are dealing with the second part.

MR. BIGGAR: Now he goes on. As a matter of fact, the division between disclosure and claims is not as clearly made here as it is somewhere else, my Lord.

HIS LORDSHIP: Apparently he switches now.

20 MR. BIGGAR: He switches in that sentence, my Lord, in the end of that sentence, “because a workman would know that it was an impractical direction or claim.” He is covering both there. Then he goes on to what is perfectly clear.

“The patentee must make it perfectly clear what it is he claims as his monopoly; the public are entitled to know at once what it is by reason of the patent they are excluded from doing.”

HIS LORDSHIP: That does not really belong there.

30 MR. BIGGAR: It does not belong. I am going to deal with both specification and claims in time. This covers both, my Lord. I do not think that there is anything in the last sentence of that that has any relevance here.

HIS LORDSHIP: That is a statement as to the necessity of giving clear, precise, accurate, unambiguous information.

MR. BIGGAR: And full. Then it goes on at the end to say it must also make the monopoly clear. Those are two general statements I am opening with, my Lord, because they cover both.

HIS LORDSHIP: Is that statement by the late president generally accepted as a correct statement?

40 MR. BIGGAR: I think there is no doubt, my Lord. I am going on to deal with the specification points that are covered there by way of analysis. They are all, I think, not controvertible. I do not think they will be disputed. I am going to give your Lordship some of the cases on particular points of that kind, and in the course of that I shall refer to the other Canadian case and some of those

Opening Remarks of Counsel

English cases to which his Lordship Mr. Justice Maclean refers at the end of that paragraph.

HIS LORDSHIP: I do not think that it is necessary for me to see each one of these.

MR. BIGGAR: Well, it is very easy, my Lord, and it might save your Lordship the trouble of getting them out and looking at them again.

HIS LORDSHIP: Yes.

MR. BIGGAR: I am only going to refer to short passages. I am
10 not going into the facts of these cases.

HIS LORDSHIP: You said there were only two cases in Canada?

MR. BIGGAR: Yes, my Lord. I am coming to the second Canadian case afterwards; but before coming to that second Canadian case, I want to give your Lordship another short statement by Lord Tomlin from the House of Lords on the general point of both disclosure and claim. It is in the case of the *British Hartford-Fairmont Syndicate Ltd. v. Jackson Bros.*, in 51 Reports of Patent Cases at p. 254. The passage is just at the top of p. 260, beginning at line 1:

HIS LORDSHIP: Yes?

20 MR. BIGGAR: It reads:

“The object of letters Patent is to secure to the patentee during the continuance of the grant the absolute monopoly of the manner of manufacture which the Patent is designed to protect. It removes the invention from the open field of competition. It follows that it is essential that the protected matter should be accurately defined in order that those familiar with the industry to which the invention relates should have clear warning of what is forbidden to them.”

HIS LORDSHIP: That is respecting the claim.

30 MR. BIGGAR: That is the claim. Continuing on:

“In complicated processes such definition is often difficult, and this consideration must be regarded in the construction of specifications and claims relating to such processes. In cases of greater simplicity confusion of language is only too often (where not intentional) evidence of confusion of thought. In the present case the alleged invention, though dealing with a matter of great commercial importance, involves no great intricacy of chemical, physical or mechanical details, and there seems no reason why, once the invention was clearly conceived,
40 the description of it should not have been stated in language of simplicity and clarity.”

I propose to give your Lordship six specific applications of those general rules, the first of them being that the disclosure must contain nothing positively misleading. There are two cases, both of great

Opening Remarks of Counsel

authority, on that point which was established at an early date. The House of Lords, in *Simpson v. Holliday*, 1 English and Irish Appeals, beginning at page 315, puts the point this way at pages 320, 321 and 322. I am not thinking of reading all of those three pages, but just extracts from them, my Lord. The first significant passage is in the middle of page 320. It is a paragraph all by itself, the first complete paragraph and reads:

10 “This question turns upon the description of the patentee’s invention contained in his specification. The patent is for ‘improvements in the preparation of red and purple dyes.’ The specification thus declares the nature of the invention: ‘I mix aniline with dry arsenic acid, and allow the mixture to stand for some time; or I accelerate the operation by heating it to, or near to, its boiling point, until it assumes a rich purple colour.’”

HIS LORDSHIP: They have two ways.

MR. BIGGAR: There are two alternative ways of doing it. Then in the next paragraph, the first part of which repeats that rule, it goes on about the middle of the paragraph:

20 “In this description the operation itself is mixing aniline with dry arsenic acid; the addition of heat is described merely as accelerating that operation. There is nothing upon the face of the specification to show that the invention described is not in every part of it the subject of a patent. But it was proved in evidence, and admitted by the plaintiff, that mixing aniline with dry arsenic acid without the application of heat would produce only a faint colour, quite unfit for dyeing purposes.”

Then at the top of the next page—

HIS LORDSHIP: Oh, yes.

30 MR. BIGGAR: You see, one of the two alternative processes really did not work. Then at the top of the next page he deals with the point about to whom it is addressed.

HIS LORDSHIP: Apparently the Court took the view that the “or” ought to be read as “and”, and that there was no intention of describing alternatives. The Court appreciated that.

MR. BIGGAR: Yes. That was by the Lord Chancellor, those passages that I read to your Lordship. Then in the middle of page 321, my Lord:

40 “The construction of the specification remaining untouched by the evidence, and the Court being informed that the invention which is claimed is not or ‘incapable of producing the result intended, it had no other course to pursue than to pronounce the Patent to be void.’”

Then Lord Cranworth on the following page, my Lord, really re-states the same point, both with regard to the alternatives and the understanding of the workman, and says at the end of the second paragraph

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of his judgment: "This clearly makes the specification bad. It specifies two processes, whereas one only is practicable."

HIS LORDSHIP: And you have cited that in reference to your contention that there is a specific rule or a specific application of a general rule that the disclosure must contain nothing that is positively misleading.

MR. BIGGAR: Nothing that is positively misleading; that is right, my Lord. And it was positively misleading in *Simpson v. Holliday* to say that the results could be obtained in either of two ways,
10 because they could in fact be obtained only in one way.

HIS LORDSHIP: Only in one way.

MR. BIGGAR: That is so, my Lord. To bring that point up to date, or nearly so, there is the very important case of *Natural Colour v. Bioschemes*. It is in 32 Reports of Patent cases, beginning at p. 256. The passage to which I want to direct your Lordship's attention is at p. 269, in the House of Lords, at line 13. It is a very short passage, my Lord. It is about twelve or fifteen lines down.

HIS LORDSHIP: Yes?

MR. BIGGAR: It reads:

20 "Once again, though the Court may consider that the meaning of the specification is reasonably clear, yet if the specification contain statements calculated to mislead the persons to whom it is addressed, and render it difficult for them without trial and experiment to comprehend in what manner the patentee intends his invention to be performed, the statements may avoid the patent."

HIS LORDSHIP: I suppose "calculated to mislead" means "likely to mislead."

MR. BIGGAR: "Likely to mislead"; yes, my Lord.

30 The next sub-rule that is followed, my Lord, is that the disclosure must really be full and correct, and in the vocabulary that is used in England, that is called insufficiency.

HIS LORDSHIP: If it is not?

MR. BIGGAR: If it is not full and correct. Well, really full. We dealt with "correct."

HIS LORDSHIP: It must not be insufficient.

MR. BIGGAR: Yes. There must be a proper description of the invention.

40 HIS LORDSHIP: Yes. And if there is not full disclosure, then the patent fails for insufficiency.

MR. BIGGAR: Insufficiency, according to the English vocabulary. There are three cases that I am going to refer your Lordship to on that point, two of them Canadian. One is *Smith Incubator v. Seiling* in 1937, S.C. It begins at p. 251, and the passage to which

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I want to refer is at p. 257. It is the second part of the page, my Lord. It comes from the judgment of Mr. Justice Duff who, I think, delivered the judgment of the Court in that case. At the beginning of the paragraph that begins in the middle of page 257, we find:

10 “The Court, called upon to deal with the issues in an action for infringement, may find it quite unnecessary to apply itself to the construction of the claims for the purpose of ascertaining the limits of the monopoly defined by the claims because it is plain on the face of the specifications as a whole that, on any construction of the claims, the defendant has not taken any part of any invention properly described and set forth pursuant to the requirements of section 14.

20 Then the defendant may attack the specification on the ground that the monopoly delimited in the claims relates to an invention which, on the specification as a whole, is not the thing invented by the patentee. He may say that though the patentee has described in the body of his specification an invention and the manner of its working, yet his claim or claims relate to a different invention which is not fully described and set forth in the specification as a whole or in any part of it within the meaning of section 14. Obviously, the plaintiff may fail on the ground, either that the patent is invalid because of non-observance of the conditions of section 14, or that the alleged infringement does not invade the monopoly defined, or because the defendant has not taken any part of the only invention fully set forth and described in the specification, in compliance with section 14.”

Of the three alternatives given by the Chief Justice in that, the first is the most significant here, namely, that the plaintiff may fail because of non-observance of the conditions of section 14.

30 Your Lordship would like to look, no doubt, at the earlier Supreme Court decision referred to by Mr. Justice Maclean in the passage that I have cited. It is *French's Complex v. Electrolytic* in 1930, S.C.R., p. 462, at p. 470. I do not think I need to read that, my Lord. Your Lordship sees the statement of it.

HIS LORDSHIP: Yes. There is this language, that it should not be construed astutely.

MR. BIGGAR: It is not to be construed astutely to deprive the inventor of the benefit of the real invention, but of the advantage of the patent.

40 HIS LORDSHIP: And also Sir George Jessel states that there should be a judicial anxiety to support a useful invention.

MR. BIGGAR: Oh, yes. But the point really that I was going to refer to your Lordship to or call your Lordship's attention to is on page 470, in the first paragraph, which begins, as your Lordship sees about the sixth line, with: “The condition for the grant is that the

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thing so claimed. . .” It is in the last sentence. Perhaps I might start with the last sentence of the first paragraph:

“And we take it that unless the claims or the description or both comply strictly with the requirements of the Act, the monopoly should not have been granted, and the patent is apparently invalid and should be declared null and void.”

HIS LORDSHIP: That is, that limits it to strict compliance with the requirements of the statute.

MR. BIGGAR: And that is likewise the judgment of, as he was
10 then, Mr. Justice Rinfret.

There is one other case that has a bearing on this point, and is therefore worth referring to. It is a case, my Lord, of *British Ore Concentration Syndicate v. Minerals Separation Ltd.*, the daddy of our opponents, the leading member of the clan. It is one of the early Minerals Separation patents, my Lord, the patent that was in question. It is in Vol. XXVII, Reports of Patent Cases, 1910, page 33, at page 47, line 24. Lines are a great help.

HIS LORDSHIP: These are wonderful reports.

MR. BIGGAR: I cannot say that this is a judgment of the court
20 here, but Lord Halsbury is really reciting a point of principle upon which really there was no difference of opinion. In the sentence that begins at line 24 we find:

“One observation refers to the extremely ambiguous and difficult character of the specification. The statute requires it to be a distinct statement of what is the invention. In construing a specification one has to remember that it is a document not only assuring a monopoly to the patentee, which but for the statute would be contrary to the common law, but so prohibiting anyone, other than the patentee, doing what he
30 would be free to do, but for the right which is granted, subject to the conditions, among other things, that the patentee states distinctly what his invention is. If he designedly makes it ambiguous, in my judgment the patent would undoubtedly be bad on that ground; but even if negligently or unskillfully he fails to make distinct what his invention is, I am of opinion that the condition is not fulfilled and the consequence would be that the patent would be bad.”

As a matter of fact, I think the patent in that case was held to be bad
40 on a ground of that kind. The whole case turned on the interpretation of the specification; while some of the judges took one view of its interpretation, others took another view.

The third sub-rule, my Lord, is that the disclosures is insufficient if the description of the operation or use of the invention fails to be filled in that necessary information is not given. There are two English cases. The operative word there, my Lord, is “necessary,”

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and it will be the distinguishing operative word in the next sub-rule. The first of the two cases to which I should like to call your Lordship's attention in support of that rule is *Badische Anilin v. La Societe Chimique des Usines du Rhone and Wilson*. It is in Vol. XIV, Reports of Patent Cases, 1897, and the report begins at p. 875. The case to which I want to refer is page 888. I think I can probably state the effect of it more easily than read it. I will read the conclusion. The position was this: There was a process that it was proposed to carry out in an autoclave. An autoclave is a particular
 10 kind of utensil in which things can be heated under pressure to a temperature substantially greater than boiling. Your Lordship understands about pressure rise?

HIS LORDSHIP: Yes.

MR. BIGGAR: There were two kinds of autoclave that were known. One was a porcelain one and one was an iron one. There was nothing said in the patent as to whether the one used should be iron or porcelain; and actually this process would not work at all except with an iron one.

HIS LORDSHIP: And the specification simply called for an
 20 autoclave.

MR. BIGGAR: It simply called for an autoclave. At the bottom of page 888:

"It appears to me that unless the specification really does imply a direction to use an iron instead of any other kind of autoclave, the directions are insufficient to enable 6 G—"

That was the product.

"— to be made."

Then at the bottom of the paragraph—I do not think I need to read the intervening part—we find:

30 "If the iron is not mentioned or implied as a necessary contribution to the materials to be used, and iron is, as it confessedly is in example 2, indispensable as a factor in the process, the description is, in my opinion, clearly insufficient, and, with reference to this objection to example 2, I do not see how it is possible to uphold the patent."

HIS LORDSHIP: And would that be so if a person well skilled in the art would say, "now, there are two autoclaves that might be used, but I know that an iron one is the one that is used, and I think that autoclave is an iron autoclave."

40 MR. BIGGAR: Well, as a matter of fact I have some cases on that point, but I doubt whether it is, strictly speaking, material here because as a matter of fact, the introduction of these organic derivatives of sulphur and the other stuff that was described in paragraph 7 had not been practiced before. Therefore I do not think it is material. That point may arise. My friend may raise

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it, and if he does, I can deal with it at that time. The answer to your Lordship's question is this, as Mr. Justice Maclean said in the first thing that I read, that if you have to experiment, you are off.

HIS LORDSHIP: Yes. If you have to choose between more than one of the known possibilities, then that is failure.

MR. BIGGAR: Yes. I do not know whether I read your Lordship the passage from Simpson and Holliday that covers it. This is at page 321, line 3:

10 "It was also said that there was a considerable body of evidence to show that skilled persons, to whom the specification must be taken to be addressed, found no difficulty in working it out, and applied heat in the process as a matter of course. This, however, cannot have any effect upon the construction of the specification. It merely proves that the description, though erroneous, is not likely to mislead skilled workmen. That the description may induce the necessity of experiments appears from the evidence of an experienced chemist, who says, 'if I found there was no action without heat, I should heat it immediately.'"

20 And notwithstanding that, they held the patent to be bad.

HIS LORDSHIP: That certainly seems to be a strict construction.

MR. BIGGAR: It is a strict construction, I agree. But the Badische Anilin case is a strong one; and the other one is on the same point.

HIS LORDSHIP: It is just 1 o'clock now. We will resume this afternoon at 2.30.

—Court adjourned at 1 P.M. until 2.30 P.M.

 AFTERNOON SESSION

NOVEMBER 15TH, 1944

30

2.30 P.M.

HIS LORDSHIP: Mr. Biggar, you were going to give me a second English case.

MR. BIGGAR: Yes, my Lord. But before I come to that, my Lord, may I hand to the Registrar the exhibits that we are going to use, which are not already marked, and have them marked, so that when I come to that your Lordship will have the full series before you?

HIS LORDSHIP: Yes.

MR. BIGGAR: Then I will put in what will be Exhibits D-62 to D-79.

40 HIS LORDSHIP: Those are documents referred to in the affidavit of the plaintiff on production?

MR. GOWLING: Some of the documents.

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MR. BIGGAR: Yes, some of the documents, not all of them.

HIS LORDSHIP: Some of the documents referred to in the plaintiff's affidavit on production. And they are the defendant's exhibits?

MR. BIGGAR: Yes, my Lord, they are the defendant's exhibits.

| | | | |
|----|---------------|------------------------|---|
| | EXHIBIT D-62: | Filed by Mr. Biggar | } Memorandum, May 10, 1923, Dr. Rosenstein to E. H. Nutter. |
| | EXHIBIT D-63: | " " | } Letter, May 25, 1923, E. H. Nutter to Plaintiff. |
| 10 | EXHIBIT D-64: | " " | } Letter, May 29, 1923, E. H. Nutter to Plaintiff. |
| | EXHIBIT D-65: | " " | } Letter, June 18, 1923, E. H. Nutter to Plaintiff. |
| | EXHIBIT D-66: | " " | } Report of tests at Anaconda. |
| | EXHIBIT D-67: | " " | } Letter, June 20, 1923, E. H. Nutter to Plaintiff. |
| | EXHIBIT D-68: | " " | } Letter, June 26, 1923, Plaintiff to E. H. Nutter. |
| | EXHIBIT D-69: | " " | } Letter, July 6, 1923, B. S. Morrow to E. H. Nutter. |
| 20 | EXHIBIT D-70: | " " | } Letter, July 19, 1923, E. H. Nutter to B. S. Morrow. |
| | EXHIBIT D-71: | " " | } Letter, July 21, 1923, E. H. Nutter to B. S. Morrow. |
| | EXHIBIT D-72: | " " | } Letter, July 26, 1923, B. S. Morrow to E. H. Nutter. |
| | EXHIBIT D-73: | " " | } Letter, August 2, 1923, E. H. Nutter to Anaconda Copper Mining Co. |
| | EXHIBIT D-74: | " " | } Letter, September 4, 1923, E. H. Nutter to Dr. S. Gregory. |
| 30 | EXHIBIT D-75: | " " | } Telegram, September 6, 1923, E. H. Nutter to Great Western Electro Chemical Co. |
| | EXHIBIT D-76: | " " | } Telegram, September 6, 1923, E. H. Nutter to Great Western Electro Chemical Co. |
| | EXHIBIT D-77: | " " | } Letter, September 15, 1923, Great Western Electro Chemical Co. to Plaintiff. |
| 40 | EXHIBIT D-78: | " " | } Telegram, September 27, 1923, E. H. Nutter to Dr. S. Gregory. |
| | EXHIBIT D-79: | " " | } Letter, February 14, 1924, C.B.A. to T. A. Janney. |

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MR. BIGGAR: I was going to give your Lordship a second case with regard to sub-rule 3. It is *Gold Ore v. Golden Horseshoe*, 36 R.P.C., 95, at 131 and 132, beginning at line 46 on page 131 and ending at line 23 on page 132. This is directed to the class of people to whom the specification is addressed. It is the judgment of Lord Dunedin:

10 “The learned Judge has described the class of people to whom a specification such as this must be taken to be addressed in language so concise and accurate that their Lordships do not hesitate to adopt it. He says:—“The specification is therefore addressed to those persons engaged in gold mining in Western Australia who would be concerned with the extraction of gold from its ore, and who would have a knowledge of the existing cyanide process and a sufficient knowledge of chemistry to understand and work the described process. It is not addressed to the working miner on the one hand, or the expert chemist on the other, but to the mine manager or his metallurgist or assayer.’”

20 We have got almost exactly the same state of affairs here. Then he goes on:

30 “Such people would, as already pointed out, assume rightly that the actual manipulation of the solvent would be according to what they were accustomed to with the old. What the practice was with the old is not in any doubt. As a practical process, the MacArthur-Forrest Patent held the field. It was worked as a percolation process through crushed ore, but the ore not reduced to a very fine dimension, or, to use mining parlance, not reduced to a slime. Slimes were avoided as much as possible and what was inevitable was put aside for separate treatment. Further, the existing method always included a large admixture of caustic alkali, designed to counteract the acid whether present in the solution or latent in the ore, which acid, if allowed to get the upper hand, would destroy the cyanide of potassium. But, caustic alkali is destructive of bromo-cyanogen. If, therefore, the old method were followed, the new solvent would not work. It is, accordingly, not surprising to learn that as a fact (and this fact is confirmed by the learned trial Judge) the new solvent applied according to the methods of the old was tried and abandoned at Brownhill, at Hannan’s Star, and Lake View Consol’s, mines. It is clear that, if a patentee puts forward a process without a warning note that if certain things are done it will be a failure, that specification will be insufficient unless the danger is such as common knowledge or ordinary practice will avert.”

40

That really states the law, I think, with extreme accuracy. In other words, the question there is: What is a full disclosure?

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HIS LORDSHIP: A disclosure might not be full if made to a working miner, but it might be full if made to a metallurgist or assayer.

MR. BIGGAR: Exactly. But if the metallurgist requires a warning note, or if the workman requires a warning note, that warning note must be given.

HIS LORDSHIP: That is what is meant by the particular rule that the disclosure is insufficient if the description fails to give necessary information?

10 MR. BIGGAR: That is it.

HIS LORDSHIP: And it must be information that is necessary to the kind of person to whom the specification is addressed.

MR. BIGGAR: Exactly.

HIS LORDSHIP: So there is nothing fixed about what is necessary?

MR. BIGGAR: No.

HIS LORDSHIP: Necessary is a relative term.

MR. BIGGAR: Exactly.

Now, that is the third rule. The fourth one is a little different, but it is the same in part. It is that the disclosure is insufficient if
20 the description of the operation or of the use of the invention fails to give useful information which the inventor had.

HIS LORDSHIP: Even if the usefulness falls short of being necessary?

MR. BIGGAR: The real distinction between the two rules is this, my Lord: that if it is necessary information there is no necessity for evidence with regard to the inventor's knowledge; that information must be given. But if it is merely useful information, then in order to invalidate the patent you must show that the inventor had that information and did not give it.

30 HIS LORDSHIP: Then it becomes a matter of proof.

MR. BIGGAR: Exactly.

HIS LORDSHIP: It must be shown that the inventor had the useful knowledge but did not give it?

MR. BIGGAR: Yes. In other words, he does not need to have worked his invention at all before he applies for his patent, but if he has worked out something useful in connection with it and does not give that to the public, then if you prove that he had the knowledge and did not give it in his specification, that makes the patent bad.

40 HIS LORDSHIP: Even if it was not necessary towards adoption of the patent by the public when the patent expired?

MR. BIGGAR: Exactly; and even if it was not the kind of information that you could say was so necessary that it must under the circumstances be included in the specification.

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HIS LORDSHIP: The rule goes as far as that?

MR. BIGGAR: The rule goes as far as that. There are two leading cases on it. The first is *Vidal Dyes v. Levinstein*, 29 R.P.C., 245. I am going to refer your Lordship to two passages; one at p. 269, line 4, and the other at p. 273, line 35. The first passage is from the judgment of Fletcher Moulton, L.J., giving the leading judgment—and a very important leading judgment of the Court of Appeal—which begins at p. 258. The Master of the Rolls really concurs, and I do not think there was any other judgment, so it is in effect the
10 judgment of the Court. Now, reading from page 269, line 4:

“It is settled law that a patentee must act towards the public uberrima fide, and must give the best information in his power as to how to carry out the invention.”

HIS LORDSHIP: He is under obligation to disclose not only what is necessary but everything that he has in his knowledge that is material.

MR. BIGGAR: That is useful in carrying out the invention. As a matter of fact it complies with the statute. You see it says “full and correct.”

20 “He is therefore bound to tell the public all the steps that can advantageously be taken in carrying out the invention.”
At page 273, line 35—

HIS LORDSHIP: Page 273?

MR. BIGGAR: Yes, my Lord, at line 35. He really repeats the same thing.

“The patentee is bound to act towards the public uberrima fide, and to tell them all that he knows which is requisite to enable them to carry out the intention to the best effect.”

HIS LORDSHIP: That is what I meant when I used the words,
30 “he is under a duty to disclose everything that is material.”

MR. BIGGAR: You see the statute says in the contemplation of the inventor, its use as contemplated by the inventor.

HIS LORDSHIP: Does it follow he has to tell everything he knows that could possibly be useful?

MR. BIGGAR: I think it goes as far as that. He must not hold back anything he has in the way of information as to how best to put this invention into practice. Fletcher Moulton goes on—

HIS LORDSHIP: Would that extend to details of information which a skilled metallurgist might not even know?

40 MR. BIGGAR: It is very hard to apply. It would depend so much on the facts with regard to the proof of knowledge, and so on. It certainly does not go to what everybody to whom the specification is addressed can be presumed to know.

HIS LORDSHIP: Where is the patent?

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MR. BIGGAR: I think it was put in in the very early stages of the trial. Have you not supplied the judge with a copy?

HIS LORDSHIP: Oh, yes, I have a copy. That is what I am asking for.

MR. BIGGAR: Exhibit P-50.

HIS LORDSHIP: That is right. Perhaps I ought not to put questions to you at this stage as to some of the terms.

MR. BIGGAR: I am going to deal with the patent specification which your Lordship has never really heard gone through critically.

10 HIS LORDSHIP: I was thinking of phrases without making reference to any particular one—such as “suitable.”

MR. BIGGAR: That is one of the points I am going to deal with.

HIS LORDSHIP: Whether the matter of suitability might be known to a metallurgist or assayer.

MR. BIGGAR: As a matter of fact I think as far as this case is concerned, subject to any evidence my friend can refer to on the point, this was a completely new class of re-agents so that really there was no technical knowledge disseminated among metallurgists about it.

HIS LORDSHIP: You mean as to the re-agent xanthate?

20 MR. BIGGAR: As to these re-agents. As a matter of fact, you remember Mr. Higgins told us they were generally speaking inorganic chemists and here we were dealing with organic chemistry, so I do not think that point will really trouble us much. May I explain why this is? I do not think it is in Lord Fletcher Moulton. The point about this, of course, is that when the patent expires the public, which has by hypothesis nothing but the specification, should be in no worse position to practice that invention successfully than the patentee himself and his licensee.

30 HIS LORDSHIP: That is really the whole purpose of section 14, so that when the patent falls—do you call it the “public domain”?

MR. BIGGAR: Public domain.

HIS LORDSHIP: When it falls into the public domain the public shall be able to utilize the invention to the same extent as the inventor.

MR. BIGGAR: Yes. One has to be not too rigid about that because it is the same position as the inventor at the time he applied for or the patent is obtained. He may have learned a great deal during the currency of it.

HIS LORDSHIP: It relates back.

40 MR. BIGGAR: It relates back to that date only. It is the “know how” as far as he has developed the know how at the time he gets his patent. I think that passage to the end of the page is worth reading.

“The patentee is bound to act towards the public uberrima fide, and to tell them all that he knows which is requisite to

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enable them to carry out the invention to the best effect. Now in this case the patentee had either made the dyes with the naphthols or he had not. If he had, he must have known that the temperatures necessary to success were vastly higher than those he had given in the case of the phenols, and the fact that he has not given that knowledge to the public must invalidate his patent. If, on the other hand, he had never made the dyes from the naphthols, he could not, in the then state of knowledge, know that they could be so produced. He had, in fact, not made an important part of the invention which he claimed. He did not and could not 'describe and ascertain' in his specification the manner in which his invention so far as relates to these bodies was to be performed, for he did not know it himself. They were inserted on speculation only, in the hope that somebody by experiment and research would find out that these bodies could be used, in which case he would claim the benefit of that which, of right, would belong to another. Without, therefore, attempting to decide between the rival views of the various eminent experts called on the one side or the other as to whether particular dyes are fairly called black dyes, I am of opinion that on this ground also the letters patent are invalid." The Court of Appeal set it aside accordingly. I should also like to refer your Lordship to a quite recent case.

HIS LORDSHIP: You say that is one of the leading cases?

MR. BIGGAR: The Vidal case is a very leading authority, my Lord. The next case is the case of *Franc Strohmenger v. Peter Robinson*. It is 47 R.P.C., 493. I refer particularly—though I cannot get it concentrated here—to page 501, line 46. I think I can make it intelligible to your Lordship perhaps better than by merely reading it, but your Lordship will find at that line I referred to it reads:

"It is suggested that Mr. Langsdorf, the Patentee (and the statement is made from the evidence which he himself gave in the box) deliberately omitted to describe the best material known to him for the lining of his patented tie. Now it is perfectly manifest that a patentee is under an obligation to disclose the best method known to him at the date of the complete specification of carrying out the invention, and it is true that, if he omits to do so, the patent is invalid, because the way in which it is generally stated is that the Crown in such a case has been deceived in the grant."

There is a later passage on that page 502 that explains it a little bit differently. It is at line 21.

"The Patentee, Mr. Langsdorf, was called and was cross-examined, and of course a number of the alleged prior users were put to him amongst other things; and he also gave evidence

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to show that he knew quite well that the best lining material at the present day for the patented tie was a wool lining of a particular weave, cut on the bias."

That is only an explanation, but the point is put up above. As a matter of fact, in that case that defence was not pleaded and Mr. Justice Maugham, as he was then, did not give effect to that. He set the patent aside on other grounds but I am citing it really to show that generally the point has been recognized very recently in the last few years. I think those are the only two cases I need
10 refer your Lordship to on that.

HIS LORDSHIP: On the obligation.

MR. BIGGAR: To give useful information known to the patentee.

HIS LORDSHIP: That is a case involving the utmost good faith.

MR. BIGGAR: Yes, like an insurance policy application from that point of view. Now we come to the claims.

HIS LORDSHIP: Those are the four rules you have given me?

MR. BIGGAR: Yes. Now we come to No. 5.

HIS LORDSHIP: Those four are rules that relate to duties of disclosure in respect of the disclosure part of the specification.

20 MR. BIGGAR: Call it description of either the invention or its operation.

HIS LORDSHIP: The description part.

MR. BIGGAR: Yes, my Lord, disclosure in the specification. These two next ones relate to the claims. Here we have to relate it to another expression used in England. Where the claim is not capable of interpretation—I mean the monopoly is not clear—the patent is said in England to be bad for ambiguity as distinct from insufficiency.

HIS LORDSHIP: That is, he must describe and ascertain.

30 MR. BIGGAR: Of course, as far as our statute is concerned, it reads: "Stating distinctly the things or combinations which the applicant regards as new and in which he claims an exclusive property and privilege." We do not use the word "ambiguity" in the statute but in the English cases they do use the word "ambiguity". The rule as I would state it would be this, that any claim in a specification is ambiguous and bad if it fails to define the scope of the monopoly claimed.

HIS LORDSHIP: If it fails—

40 MR. BIGGAR: If it fails to define the scope of the monopoly claimed. By way of parenthesis I wonder if your Lordship, on that question of insufficiency and ambiguity, would like to have a reference to that distinction as it is made.

HIS LORDSHIP: Between insufficiency and ambiguity.

MR. BIGGAR: I think I have it here.

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HIS LORDSHIP: That is, that insufficiency relates to the description and ambiguity to the claim.

MR. BIGGAR: I am afraid it is not here. I will give it to your Lordship later. I can give the reference but it would be better to get it later when I get the volume. On this fifth rule with regard to the ambiguity of the specification in that it fails to define the scope of the monopoly claimed there is another very leading case which I have already referred to on another point. That is Natural Colour and Bioschemes that your Lordship has already had, but I am referring to
 10 different pages. It is 32 R.P.C., 256, and here I am referring to pages 266—

HIS LORDSHIP: 32 R.P.C.?

MR. BIGGAR: Yes, 256, and I am referring to pages 266, line 14 and 272, line 5. This is in the House of Lords.

HIS LORDSHIP: May I have that again?

MR. BIGGAR: Page 266, line 14 and page 272, line 5. The Court of Appeal in a very good judgment by Lord Justice Buckley disposed of the case on a ground which I am coming to, and I am going to refer to Lord Justice Buckley on that other ground, but this I am
 20 taking from Lord Loreburn in the House of Lords. After agreeing with the grounds upon which Lord Justice Buckley put the disposition of the case in the Court of Appeal he added this at page 266, line 14:

“I wish to add that, quite apart from these grounds”—that was Lord Justice Buckley’s grounds—“I think this patent is bad for ambiguity in the specification. There seems to be some danger of the well known rule of law against ambiguity being in practice invaded. Some of those who draft specifications and claims are apt to treat this industry as a trial of skill, in which the object is
 30 to make the claim very wide upon one interpretation of it, in order to prevent as many people as possible from competing with the patentee’s business, and then to rely upon carefully prepared sentences in the specification which, it is hoped, will be just enough to limit the claim within safe dimensions if it is attacked in court. This leads to litigation as to the construction of specifications, which could generally be avoided if at the outset a sincere attempt were made to state exactly what was meant in plain language. The fear of a costly law suit is apt to deter any but wealthy competitors from contesting a patent. This
 40 is all wrong. It is an abuse which a court can prevent, whether a charge of ambiguity is or is not raised on the pleadings, because it affects the public by practically enlarging the monopoly, and does so by a kind of pressure which is very objectionable. It is the duty of a patentee to state clearly and distinctly either in direct words or by clear and distinct reference, the nature and limits of what he claims. If he uses language which, when fairly

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read, is avoidably obscure or ambiguous, the patent is invalid, whether the defect be due to design, or to carelessness or to want of skill. Where the invention is difficult to explain, due allowance will, of course, be made for any resulting difficulty in the language. But nothing can excuse the use of ambiguous language when simple language can easily be employed, and the only safe way is for the patentee to do his best to be clear and intelligible. It is necessary to emphasize this warning. To my mind, this is a very plain case of offence against the rule to which I have referred.”

10

He says that he cannot think of any object or any purpose in it except to make trouble. The other passage in that was at page 272, line 5, where Lord Parmoor very shortly puts the same point. He concludes his judgment this way.

20

“My Lords, I desire to add a few words on the construction of patent grants to which reference has been made. The word, ambiguity, is itself ambiguous. It may denote that the language used is not sufficiently explicit, in describing the nature and ambit of the invention, to ensure to the public the benefit of the discovery, when the period fixed in the grant, as the period of monopoly, comes to an end. Such ambiguity invalidates the grant. In another sense ambiguity may denote that language has been used with the object of creating complexity, or leaving open to the patentee or his advisors a choice of alternative constructions. This has been called a studied or affected ambiguity. Such ambiguity is inconsistent with the good faith which is demanded of a patentee in return for his monopoly grant and invalidates the grant. In a third sense there is ambiguity which arises from the difficulty of accuracy in expression, there being no suspicion of the want of good faith, and where the language used, if capable of being constructed in the sense claimed, would give a sufficient description of a new and useful invention. I apprehend that in this case the same principles apply to the construction of a patent grant as to other documents which determine public rights or obligations, as distinct from documents which define the contractual relationship between the contracting parties, and that, if, applying these principles, the grant is fairly capable of being construed in the sense claimed, it is a valid grant and supports the claims of the inventor to his monopoly right.”

30

40

It is the same point about a fair construction. The next case on that rule that is worth referring to is a very recent case of *General Railway v. Westinghouse*, 56 R.P.C., 295. The passage which is relevant on this point is at page 382 at line 29. He says:

“In my view no defect of pleading (if there were any defect) would prevent the court from holding that a claim was ambig-

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uous, since it is the duty of a patentee to state clearly and without ambiguity the scope of the monopoly which he claims." Then he refers to Lord Parker in *Natural Colour and Bioschemes* and quotes what he says. I did not read that. It reads:

"It is open to the court to conclude that the terms of a specification are so ambiguous that its proper construction must always remain a matter of doubt, and in such a case, even if the specification had been prepared in perfect good faith, the duty of the court would be to declare the patent void.' "

10 There is still a later case that has got the same thing. It is *Whatmough v. Morris Motors*, 57 R.P.C., 177. At page 198, line 50, Mr. Justice Farwell refers to an expert witness of extremely high standing and great sincerity

20 "who told me in answer to a question by his counsel that the words added at the end of that claim convey nothing to him from the point of view of attempting to construct an internal combustion engine in accordance with these directions in this specification. That answer seems to me to be completely justified when one considers the language which is used. The truth of the matter is that, so far as this claim is concerned, the language used leaves it open to the greatest possible doubt as to the way in which it is intended that the alleged invention should be applied and the necessary construction made. In my judgment, no claim framed so loosely and so open to serious question can be a valid claim in a specification."

It is looseness of expression, and that applies to one of the claims we have here.

30 The last rule, my Lord, also with regard to claims, is that any claim in a patent is bad if it includes or extends to anything old or anything useless, that is, unworkable. Nothing turns here, my Lord, so far as the claims in suit are concerned, upon claims extending to anything old but I have made the rule cover both because otherwise it would not be comprehensively stated, but the old is not material for the purpose of the claim in suit. I go back again to *Vidal Dyes* at 29 R.P.C., 245. There are two other passages which cover that point. One of them is at page 268, line 41 and the other at page 270, line 6. It is just a very short sentence from the judgment of Lord Fletcher Moulton.

40 "By his specification, and the claim with which it concludes, the patentee delimits the area of his monopoly. If the validity of his patent is challenged, he has to show that all within that area is novel and useful, and if he does so his patent is valid, assuming, of course, that he has duly performed his other obligations."

HIS LORDSHIP: Everything within the claim must be novel and useful.

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MR. BIGGAR: Then it is stated with regard to the facts of the case that were before the court on page 270 at line 6, just another short passage:

10 “In the case of dinitrophenols, the specification clearly says that you must reduce by sulphuret of sodium before you expose the body to the reaction of sulphur, which causes the formation of the dye. But in the case dinitronaphthols, the specification only says that you may advantageously do so, and it clearly reserves to the patentee, as one method of carrying out his invention, that you should perform the dye-forming reaction without previously treating the dinitronaphthols with sulphuret of sodium. Both these processes, therefore, are included within the claim, and it is admitted that the latter will not work. It follows, therefore, that on this ground also the patent must be held to be invalid.”

HIS LORDSHIP: It included a claim that was useless.

MR. BIGGAR: Included something that was useless. I make a distinction between that and Simpson and Holliday because at the time of Simpson and Holliday claims were not obligatory whereas by this time they were obligatory. Your Lordship will find something in 20 the Natural Colour and Bioschemes case which is interesting on that point, too. I am going to refer to both 31 and 32 R.P.C.

HIS LORDSHIP: I have 31 but not 32.

MR. BIGGAR: I come to 31 first.

HIS LORDSHIP: I had it this morning.

MR. BIGGAR: It may be that the stenographer borrowed it.

HIS LORDSHIP: That is likely. Go ahead.

MR. BIGGAR: I can go on with 31, my Lord.

HIS LORDSHIP: Is this dealing with the same rule?

MR. BIGGAR: The same rule, yes, covering anything useless or 30 old. In 31 the case is reported at page 237.

HIS LORDSHIP: What is the name of it?

MR. BIGGAR: 31 R.P.C.

HIS LORDSHIP: What is the name of the case?

MR. BIGGAR: Natural Colour and Bioschemes, 31 R.P.C., 237. I ought to warn your Lordship, too. It begins at 237 and I am referring to page 250, line 4. As a matter of fact, if your Lordship will look at the heading in the book in your hand it is really called an appeal in the matter of G. A. Smith's Patent. It does not really matter. It was Natural Colour and Bioschemes in the House of Lords, and it is 40 convenient not to use two names for the same case in the Court of Appeal and below.

HIS LORDSHIP: Oh, yes.

MR. BIGGAR: In the leading judgment in the Court of Appeal which was given by Lord Justice Buckley at the top of page 250, line 3, it says:

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“As a third alternative, the patentee may mean that the reader is to take any two which will ensure success. This, of course, is invalid for insufficiency. If the claim is for any red and any green that will answer the purpose, it is invalid for not distinguishing those that will answer the purpose. If it is a claim for all reds and all greens it is invalid because there are some which will not answer the purpose.”

HIS LORDSHIP: It will include some matters that are not useful.

MR. BIGGAR: Yes. The passages in 32 R.P.C. are at pages 266,
10 lines 2 and 268, line 5.

HIS LORDSHIP: I have those pages now.

MR. BIGGAR: At the top of 266 the Lord Chancellor, Lord Loreburn—

HIS LORDSHIP: 266?

MR. BIGGAR: Yes, my Lord. He says:

20 “The essence of Mr. Smith’s invention, or supposed invention, was that, whereas it had not been found practicable to present a picture in three colours so that the eye should blend them into one naturally coloured picture, yet it was practicable to effect this with two colours—viz., tri-red and tri-green, as we have called them, and so to produce an agreeable result, though without blue, in a kinematograph. Nothing was easier than to say what he claimed plainly in the specification and claim. Instead of doing so, Mr. Smith omitted to say that he confined his claim to what were called tri-colours, or to say that, of them, he only claimed red and green, or to say that the pleasing picture would exclude blue. On the contrary, he conveyed that no colours of nature would be excluded, and that any two colours would produce the results, which is not true. The patent is bad
30 for the reasons stated in the Court of Appeal.”

The other passage on that was at page 268, line 5. That is the passage I think I have already referred to.

HIS LORDSHIP: No.

MR. BIGGAR: No, that is quite right. It is Lord Parker at line 5.

“My Lords, it was proved at the trial that there are some reds and some greens which cannot be used in the process. If, therefore, as suggested by the words ‘red and green colour sensations,’ the patentee is claiming the use of any red or green, the patent is void.”

40 There is one more case and that is all, my Lord. It is the recent case of Norton and Jacobs, 54 R.P.C., 58. I think your Lordship ought to have it. It is a small volume.

HIS LORDSHIP: No, I have not got one.

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MR BIGGAR: I am going to refer to 54 R.P.C., 58 at page 74, line 2, and in appeal in the same volume, 54 R.P.C., 271, at page 276, line 24. There is no copy of it, my Lord?

HIS LORDSHIP: I have not that.

MR. BIGGAR: I am sorry. This was Mr. Justice Clauson, now Lord Clauson. He makes an assumption which is contrary to the rule as laid down in Vidal but he is prepared to do it because he does not alter the conclusion.

10 “I am prepared to assume that I may construe this as a claim covering only the case of the presence of such a reducing agent as he has indicated to be suitable, though I am by no means clear that in so doing I am not favouring the patentee overmuch.”

You see he claimed it was suitable.

20 “But even so, he is clearly claiming a monopoly in the process if any of the reducing agents are present which he has said to be suitable, notwithstanding that, in view of the fact which I have labelled (b), the process may well be employed with the presence of such a reducing agent, and yet fail, and fail merely because the reducing agent which he says is suitable is in fact unsuitable and does not produce the promised result. A consideration of the judgment of the Court of Appeal delivered by Lord Justice Moulton in *Vidal Dyes v. Levinstein* seems to me to leave no possible conclusion open to me except to hold that this circumstance involves of necessity the invalidity of the patent.”

In the Court of Appeal the point is put at page 276, line 24, by Lord Justice Greene. He was Master of the Rolls. It is very short and is as follows:

30 “Now if claim 1 be read by itself and construed in accordance with the ordinary meaning of the language used, it is apparent that the use of any reducing agent falls within it. The character of the reducing agent to be used is not defined by reference to any particular quality or any particular result. If the matter stood there, the claim would be unquestionably bad.”

Then he goes on to say that it is bad in the circumstances anyway.

Those are the six rules and sub-rules of the general rule that I think may be relevant. Is there another passage there that I should read?

40 MR. ROBINSON: Yes.

MR. BIGGAR: Yes. There is another passage in cross-examination, of which I have not a note, and perhaps your Lordship would like to read it. It is the second passage on page 74 in the volume.

HIS LORDSHIP: Page 274? In the Court of Appeal?

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MR BIGGAR: No. It is in Mr. Justice Clauson's Judgment. Your Lordship already has a note of it.

HIS LORDSHIP: Page 74, line 2, you say?

MR. BIGGAR: Page 74, line 2. Then at page 74, line 33.

HIS LORDSHIP: Oh, yes, in the Court below.

MR. BIGGAR: Yes. Mr. Justice Clauson says:

10 "The monopoly is quite clearly, indeed only too clearly, claimed, but it covers that which the patentee alleges will work, but which in fact will not work, that is to say, a process in which there is present in the finished picture one or other of the reducing agents alleged to be suitable but in fact quite useless to achieve the promised results."

In other words, in the claim there it was quite clear that it covered what would not work.

HIS LORDSHIP: This will be a good point to have a break for ten minutes.

MR. BIGGAR: Very good, my Lord.

—The Court recessed for ten minutes. On resuming:

20 MR. BIGGAR: I told your Lordship that I would give you a reference in the recent case as to the distinction between ambiguity and insufficiency. It is *No-Fume Ld. v. Frank Pitchford*. It is in 52, R.P.C., page 231, and the definition of it is at the top of page 236, line 2. The introduction is at the bottom of page 235. I do not know whether your Lordship has that judgment. It is quite short, my Lord. At the bottom of page 235 the definition is introduced in this way:

30 "The learned Judge in his judgment points out the importance of the difference between insufficiency and ambiguity. Also he said that Mr. Moritz, who appeared for the defendants had directed his argument mainly to those two issues. As he rightly points out—

And then he quotes from the trial judge or Mr. Moritz, I do not know which it is, but it is all quoted.

40 "—'insufficiency is directed to the issue whether the description is sufficient to enable those persons to whom the specification is addressed to understand how the subject matter of the patent, if it is an article to be manufactured, has to be made, or if it is a process or method, how it is to be worked. Ambiguity is directed to the issue whether the invention is sufficiently described and ascertained so as to enable the public to understand the scope of the monopoly granted by the letters patent.'"

Then Lord Hanworth goes on:

"That appears to me to be a useful statement, when one is embarking upon the matters and the evidence to which our attention has been directed."

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So that the definition had been approved by the Court of Appeal.

HIS LORDSHIP: You have now given to me six specific applications of the general rules laid down by Section 14.

MR. BIGGAR: Yes, my Lord.

HIS LORDSHIP: Of the Patent Act that was applicable at the time. Are you going to indicate the respects in which these rules, whether general or special, have been violated in the specification?

MR. BIGGAR: Yes, my Lord. That is what I am proposing to do now.

10 HIS LORDSHIP: I had better have the specification before me, then.

MR. BIGGAR: However, before I do that, I am going to call your Lordship's attention to one other point—that is by way of preliminary—which is not a defence but is a comment on the whole situation presented in this case. It is the point that my friend referred to this morning as laches.

HIS LORDSHIP: You are going to deal with that later, I suppose?

MR. BIGGAR: No, my Lord. I am not making a defence upon that, because the only authority that there is is an authority against
20 its being a defence. I am sorry that is so, but that is the fact.

HIS LORDSHIP: You mean that you are not relying upon the defence of laches?

MR. BIGGAR: I cannot. I think it is a defect in our patent law, but it is a defect which we cannot remedy here.

HIS LORDSHIP: That suggestion you must place before the Legislature and not before this Court.

MR. BIGGAR: Yes, my Lord.

HIS LORDSHIP: Does that extend to the allegation that the plaintiff brought the action just before this patent expired—

30 MR. BIGGAR: That is the point.

HIS LORDSHIP: —because he was afraid of having the validity of these patents tested.

MR. BIGGAR: That is the point, yes. Mr. Gregory puts it very well at pages 47 and 48 of his examination, my Lord, or I should have said Dr. Gregory. I think your Lordship has a copy of this evidence, if you would like to look at it.

MR. GOWLING: This is the one that is lost. The original of that appears to have been lost, although we are endeavoring to trace it, coming back from New York. If we cannot trace it by tomorrow, we
40 will have a further copy made.

MR. BIGGAR: My friend Mr. Finlay will lend his Lordship his copy in the meantime. The introduction to it, my Lord, begins at Question 149 on page 47. I think that may be Williams' examination that is bound up with it. Gregory's is probably at the end.

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HIS LORDSHIP: That is right. It is at the end. What is the question?

MR. BIGGAR: Q. 149.—my Lord. Your Lordship sees that his attention is directed to some correspondence with Norands, and at the end of his answer to Q. 149 he says he got Mr. Bennett to see Mr. Murdoch and ask Mr. Murdoch—that is the President of Noranda—to meet him, and that nothing ever came of that; and then at the bottom of the page, that he made a recommendation that nothing should be done. Then at the top of the next
10 page, 48 he says:

“Until the patent expired or even very near expiring, because—there were two reasons. One of them was this: the tonnage that we would gain by fighting with Mr. Murdoch’s corporation was a small fraction of what was coming to us from other directions, and—I may have been wrong or I may have been right, I don’t know which it was, but I thought it would disturb our relationship with the licensees that were paying and they might very well have said, ‘Well, since this fight is on, we will stop paying or do something until it is decided who wins or
20 loses.’ See?”

And then the answer continues:

“I don’t want that to arise; but, in addition to that, we had a large amount of tonnage being treated in the United States, and all our licensees were paying us, even the Anaconda and the Utah, notwithstanding the decision of the Court in San Francisco. Right to the very end of the termination of the xanthate patent—”

As he calls it.

“—they were paying us royalties.”

30 Then the answer to the next question is:

“I did not want to disturb that relation. That was one reason, you see. That is a pretty good reason as a business proposition, too. I may have been wrong and I may have been right, but my Board said: ‘All right, if you think so, let it be so’ ”.

HIS LORDSHIP: It sounds like a sound business proposition.

MR. BIGGAR: Yes, it sounds like a very sound business proposition. As a matter of fact that discussion began in 1930—the correspondence shows this, and I am just summarizing it—and between 1930 and 1936 there were efforts on their part to discuss it with Mr.
40 Murdoch with a view to getting him to submit, and so on; and finally in 1936 it was given up altogether and they waited then until—

HIS LORDSHIP: Shortly before the patent expired.

MR. BIGGAR: Well, it was only two or three days actually, my Lord. The patent expired—

HIS LORDSHIP: On the 10th of March.

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MR. BIGGAR: Yes, on the 10th of March; and the writ in this action was issued on the 1st of March, so they were ten days ahead. As a matter of fact, as the defence shows, and I imagine my friend will admit it because I can call the evidence, if necessary, from downstairs; there were about twenty other actions against other defendants.

HIS LORDSHIP: Yes. It appears somewhere in these proceedings.

MR. GOWLING: Yes. I think there were nineteen, my Lord.

MR. BIGGAR: I knew it was about that.

10 HIS LORDSHIP: Twenty altogether?

MR. GOWLING: Yes.

HIS LORDSHIP: I have seen it somewhere in these proceedings.

MR. GOWLING: It is a fact, anyway, my Lord. We started several at once.

MR. BIGGAR: This is the position with regard to that. As I say, it might very well be a defence, but in the *Vidal v. Levinstein* case something of the kind occurred, and at page 259, this is the way it is put by Lord Justice Fletcher Moulton, at line 4:

20 “The alleged infringement is, substantially, the making of a dye which, it is admitted, has been made for many years (ever since the year 1900) in enormous quantities, and sold openly in the market. It was known to be made under, and in accordance with, letters patent granted in January of 1900 to Charles Denton Abel on behalf of the well-known Berliner Company. The writs in these actions, however, were not issued until the 22nd of July, 1910, that is to say, two days before the expiry of the letters patent sued upon. It is, of course, settled law that a patentee need not attempt to stop an infringement when he first learns of it, and if the plaintiffs succeed in establishing their case in the
30 present actions they will be entitled to damages, or to an inquiry into profits for infringement occurring within six years before the date of the writs.”

HIS LORDSHIP: “None of these circumstances affect the legal rights of the plaintiffs . . .”

MR. BIGGAR: Yes, I forgot that sentence. That being the judgment of the Court of Appeal in England, I cannot quarrel with it here. There is a remote possibility, of course, that this case may go far enough for me to say that the position is not as Lord Justice Moulton stated it there.

40 HIS LORDSHIP: I was going to ask you whether the defendant abandons the defence set out in paragraph 3 of its statement of defence.

MR. BIGGAR: Is that the defence, my Lord?

HIS LORDSHIP: That is the defence in relation to laches. It says, “The plaintiff is not entitled to the relief claimed because of its laches and acquiescence.”

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MR. BIGGAR: No, my Lord, it is not abandoned; but I cannot successfully urge it here in view of that judgment.

HIS LORDSHIP: You mean that you cannot urge it in this Court?

MR. BIGGAR: In this Court.

HIS LORDSHIP: Because this Court is bound by the authority that is mentioned.

MR. BIGGAR: I think so. I cannot suggest any ground upon which your Lordship would be justified in disregarding so clear and
10 definite a judgment of the Court of Appeal in England.

HIS LORDSHIP: I think it might be difficult for you to get past it, without really knowing much about it.

MR. BIGGAR: At all events, I am not trying to do so here.

HIS LORDSHIP: But I am not to take it that you are completely abandoning that defence?

MR. BIGGAR: No. I am putting it as I say.

HIS LORDSHIP: You are putting it that you cannot rely upon it in this Court.

MR. BIGGAR: I concede that I cannot rely upon it here.

20 MR. BIGGAR: I think we have finished with authorities now. As we go along I may need to refer your lordship back on particular points to the general and sub-rules that I have attempted to support.

Your Lordship has really never heard any discussion of the patent, and while it is not exactly in the order that I have dealt with the sub-rules I think the proper way of dealing with the specific points is to deal first with the failure of the specification to describe the invention.

HIS LORDSHIP: You are going to point out the respects in which, according to your contention, the specification falls short of the statu-
30 tory requirements?

MR. BIGGAR: In that regard, yes, my Lord.

HIS LORDSHIP: As regards the description of the invention.

MR. BIGGAR: Its failure to describe the invention, what the invention is. That comes under sub-rule 2, as I stated them. That really involves a critical examination of the contents of the specification, which your Lordship has not heard, I think, in any way that makes it really easy to follow.

Perhaps I ought to say first what my point about the whole thing is. What I am leading to is this, that after you read this specification,
40 this disclosure, from end to end, you are left completely in the dark with respect to what Keller's invention was. Your Lordship will see what it says, taking paragraph 2:

“This invention relates to the froth-flotation concentration of ores, and is herein described as applied to the concentration of

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certain ores with mineral-frothing agents in the presence of certain organic compounds containing sulphur.”

In other words, to begin with, that is careful to say that the invention is wider even than it is herein described. It is described by reference to so-and-so, but that is not the invention. The invention may be applied to something else altogether than the concentration of ores, as far as this paragraph is concerned. It is herein described as applied to the concentration of ores but, as I say, it may be applied to something else altogether than that. But that is not the most
 10 serious defect in this paragraph. It says the invention “is herein described as applied to the concentration of certain ores with mineral-frothing agents in the presence of certain organic compounds containing sulphur.” So even if it is applied to the concentration of ores, if it is confined to that, we are left completely in the dark as to the kind of ores and the kind of organic compounds containing sulphur.

HIS LORDSHIP: I suppose he could not describe it all in one sentence.

MR. BIGGAR: No. I am analysing it to show that we do not get anything out of that paragraph.

20 Now let us take the next paragraph, No. 3:

“It has been found that certain sulphur derivatives of carbonic acid greatly increase the efficiency of the froth-flotation process when used in connection with mineral-frothing agents.”

That makes it quite clear that it is not all sulphur derivatives of carbonic acid that we are concerned with, but only certain of them.

Then the paragraph goes on to say that the increased efficiency shows itself sometimes in such-and such a way and sometimes in such-and-such a way. That is simply a statement of fact, which does not advance us or retard us.

30 Then paragraph 4:

“The invention is herein disclosed in some detail as carried out with salts. . . .”

I am coming to what the salts are, but that is not a statement of what the invention is at all, as your Lordship will see in a moment. It is true that the invention is disclosed in some detail as carried out with some salts of some sulphur derivatives of carbonic acid, but the inventor is careful in this paragraph not to say that the invention consists in the use of those particularly described salts. He only says that it is disclosed in some detail in relation to those described salts.

40 That leaves him perfectly free to say that this is not a restrictive thing at all, that it is simply a particular example of the invention or a set of examples of the invention that he has chosen to disclose.

The salts of the sulphur derivatives of carbonic acid by reference to which the invention is disclosed in some detail are those “containing an organic radical, such as an alkyl radical, and known as

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xanthates, as the new substance.” At this stage I have to turn to Exhibit K-47, which is a file wrapper of Keller’s United States patent. I can tell your Lordship what is in that. The point about that sentence is that when the application was first filed in the United States, on the 23rd of October, 1923, that sentence read, “salts of the sulphur derivatives of carbonic acid containing an alkyl radical and known as xanthates.” In other words, it was deliberately extended by inserting the word “organic” in place of the word “alkyl” before the word “radical”, and was made to extend to sulphur derivatives containing
 10 any organic radical, such as an alkyl radical. We are going to give evidence to show that that includes probably a large number of radicals that are not strictly within the alkyl class. There are two main lines of radicals, and there are two possible alternative interpretations of this. The two groups of radicals are alkyl radicals and what are called aryl radicals.

HIS LORDSHIP: I understood that the United States application was identical with the Canadian one.

MR. BIGGAR: No, my Lord. That amendment was made in the course of the prosecution. I can give your Lordship the date upon
 20 which it was made; it was quite late.

MR. GOWLING: It is the two patents that are identical, my Lord, the United States patent and the Canadian patent.

HIS LORDSHIP: You are now speaking of the original application for the United States patents?

MR. BIGGAR: Yes. I am speaking of the original application, as amended in the course of the prosecution. The amendment was made by an undated document which appears to have been received in the United States Patent Office on the 28th of March, 1924, the application having been filed on the 23rd of October, 1923.

30 HIS LORDSHIP: The amendment was made in the wider form that you have indicated?

MR. BIGGAR: I just want to be quite sure I have the right amendment. At all events, it was made some time after the file wrapper shows.

HIS LORDSHIP: And made in the wider form that you have indicated?

MR. BIGGAR: Made in the wider form. In that amendment that I speak of, of March, 1924, there was inserted this restriction: “These form anions and cations in solution.” That was not in the application
 40 as originally made.

So during the prosecution there was both an extension to radicals such as alkyl radicals, and a limitation to compounds which form anions and cations in solution.

The next sentence in paragraph 4 of the patent is an extraordinary sentence, as will appear perhaps more clearly when we have

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given evidence. Its extraordinary character appears from a mere reading of it:

“Excellent results were also obtained”

That is to say, as if it was dealing with something that was not xanthate.

“by agitating ore pulps with the complex mixture produced when 33 $\frac{1}{3}$ % of pine oil was incorporated with an alcoholic solution of potassium hydrate. . . .”

10 Now, you see, the agitation there is with the complex mixture either of the pine oil and the alcoholic solution of potassium hydrate, or of those two things with the ore pulp. And then it goes on, continuing the sentence, as if you had some result of that agitation, by saying:

“and xanthates or analogous substances were produced by adding carbon disulphide to this mixture.”

20 Now, as a matter of fact, as your Lordship has heard from the description that has been given here of xanthates, the way you make a xanthate at all is by incorporating an alkali, alcohol and carbon disulphide. It looks as if this was a proposal to agitate a pulp with only the alcohol and the alkali, and then by doing that you produce xanthates in the pulp by adding the carbon disulphide to this mixture of the pulp with these other two ingredients. That is not a thing that any witness can probably use very much on, except to say that the complex mixture of the ore, the pine oil and the alcoholic solution would not produce xanthate, and that you could not produce it until you had added the carbon disulphide. Whether it would ever produce xanthate even in this circumstances, I do not know.

HIS LORDSHIP: May I just point out that in paragraph 4 of the copy of the patent that I have the words are “complex mixture producer” instead of “complex mixture produced”.

30 MR. BIGGAR: And I take it your Lordship has the certified copy?

HIS LORDSHIP: Yes.

MR. BIGGAR: It is “produced” in my copy. Perhaps the original is available. I do not think anything would turn on that. It is probably an obvious clerical error. It says “produced” in another certified copy that we have, my Lord. I am quite satisfied it should be “produced”. We have gone on the assumption that that is how it should read.

HIS LORDSHIP: Then should I change the “r” to “d”?

MR. BIGGAR: Yes, my Lord.

40 HIS LORDSHIP: I think it must clearly have been intended to read “produced”.

MR. BIGGAR: I think so.

I am dealing with these points on the difficulties of interpretation of this specification as they arise. And what I say is that you are no

Opening Remarks of Counsel

further ahead in determining what the invention is when you have got through with paragraphs 2, 3 and 4.

HIS LORDSHIP: Your observation is that one might think that xanthates or analogous substances were produced by this total process?

MR. BIGGAR: Yes, by agitating the pulp with those other two things.

HIS LORDSHIP: By first of all agitating and then incorporating 33 $\frac{1}{3}$ % of pine oil, with an alcoholic solution of potassium hydrate; 10 then xanthates or analogous substances were produced by the further addition of carbon disulphide to this mixture, and all added to the pulp?

MR. BIGGAR: Yes.

HIS LORDSHIP: No, I do not think you can take that interpretation from it. It says, "Excellent results were also obtained by agitating ore pulps," and the rest of it is what you agitate the ore pulps with.

MR. BIGGAR: That may be the proper interpretation. But of course if that was intended, then it ought to read: "when 33 $\frac{1}{3}$ % of 20 pine oil was incorporated with an alcoholic solution of potassium hydrate to which carbon disulphide had been added so as to produce xanthates or analogous substances". That is the way you have got to read it, to make it intelligible at all. The first sentence and the second sentence of that paragraph do not really add anything to your knowledge of exactly what the invention was. And the third sentence presents a problem in construction. That is as far as I need to go at the moment.

—Court adjourned at 4.15 o'clock p.m., until Thursday, November 16th, at 10.30 a.m.

30

OTTAWA, NOVEMBER 16TH, 1944

MORNING SESSION

ARGUMENT BY MR. BIGGAR, resumed:

MR. BIGGAR: We were on paragraph 4 of the specification, my Lord. I was calling your Lordship's attention to the amendment that was made in that.

HIS LORDSHIP: Had you finished with your comments on paragraph 4?

MR. BIGGAR: No, my Lord; you will remember we did not find the United States prosecution, exhibit K-47 yesterday. I was 40 going to call your Lordship's attention to that.

HIS LORDSHIP: To the—

Opening Remarks of Counsel

MR. BIGGAR: The amendments that were made in the course of the United States prosecution.

HIS LORDSHIP: You made some reference to it?

MR. BIGGAR: I made some reference to it. I am calling your Lordship's attention to the amendment because we had not got exhibit K-47?

MR. GOWLING: We have one anyhow.

MR. BIGGAR: Here is a certified copy, my Lord, which will serve the purpose perfectly well. I have a copy of it. Here is the document. It is a copy certified by the United States Patent Office, which is quite all right.

HIS LORDSHIP: My understanding is that the patent in suit as granted is identical with the patent that was granted by the United States.

MR. BIGGAR: That is so. So that the amendments in the course of the prosecution are only in the United States.

HIS LORDSHIP: So that the amendments in the course of the prosecution are only in effect in the United States.

MR. BIGGAR: Yes. Your Lordship will find there a copy of the specification at the top, I think folios 1, 2, and so on, with the amendments shown, but they are not very satisfactorily shown on that copy. Your Lordship will see in the second line of paragraph 4 the word "alkyl" is struck out. It originally read—the first sentence—

"The invention is herein disclosed in some detail as carried out with salts of the alkyl sulphur derivatives of carbonic acid known as xanthates, as the new substance."

Then, what is now the third sentence immediately follows, but in the amendment, which was not the amendment made in March but an amendment made in August, 1925—and I will refer your Lordship to the page at which they were made—it was striking out the word "alkyl" in line 2 and adding after the sentence "these form anions and cations", after the word "substances" at the end of that sentence—

HIS LORDSHIP: After the word "substances" at the end of that sentence.

MR. BIGGAR: Yes, my Lord, after the word "substances".

HIS LORDSHIP: Certain words were added.

MR. BIGGAR: And insert in the middle of the sentence the words, "containing an organic radical such as an alkyl radical." These amendments were not made until the 7th of August, 1925. Your Lordship will find the amendment on what is noted as folio 23 of the United States proceedings. The folio is just below the patent office stamp, and the Patent Office stamp is August 7th, 1925. It is called F-23 and it is rather under the fastenings of the bundle. Your Lordship will have to pull the thing right up to find it.

Opening Remarks of Counsel

HIS LORDSHIP: Oh, that is at the top.

MR. BIGGAR: Right at the very top.

HIS LORDSHIP: Yes.

MR. BIGGAR: Your Lordship will see—

HIS LORDSHIP: Page 2, line 17 after “acid” insert “containing an organic radical such as an alkyl radical and”.

MR. BIGGAR: And the previous one, page 2, line 16, erase “alkyl”.

HIS LORDSHIP: Page 2, line 16, erase “alkyl”.

10 MR. BIGGAR: Then, further down, page 2, line 18.

HIS LORDSHIP: Line 17.

MR. BIGGAR: Line 17 is just a comma. Then, line 18 is before “excellent” insert “these form anions and cations in solution.” As a matter of fact, while I am on that—because I need not refer to it at all—the same amendment was made in claims 1 and 2 at the same time, “adapted to form in solution anions and cations.” It just follows that.

HIS LORDSHIP: Claim 1, line 3.

MR. BIGGAR: And claim 2, line 4.

20 HIS LORDSHIP: After “acid” insert “adapted to form in solution anions and cations”, and the same amendment made in claim 2, line 4.

MR. BIGGAR: Yes. This was the amendment made at that time on the 7th August, 1925.

HIS LORDSHIP: The 7th August, 1925?

MR. BIGGAR: Yes. Just in passing it we might note that the document I have handed to his Lordship might be marked exhibit K-47.

HIS LORDSHIP: Is it not marked?

30 MR. BIGGAR: No, that is the one we got ourselves. The Registrar says that particular exhibit was not returned with the commission.

HIS LORDSHIP: Then it is intended to be marked K-47.

MR. BIGGAR: K-47. Before going on to the next paragraph, my Lord—

HIS LORDSHIP: May I just interrupt for a moment? The Registrar brought to my attention yesterday that certain exhibits were put in to be marked as exhibits D-62 to 80, but that they were one short.

40 MR. BIGGAR: We will have that verified. That is all straightened out.

HIS LORDSHIP: So that for purposes of the record the documents that are put in out of the plaintiffs affidavit on production will be marked exhibits D-62 to D-79.

Opening Remarks of Counsel

MR. BIGGAR: Before I go on to paragraph 5, my Lord, it might be useful to remark that up to that point all that we know is that the invention has to do with the use of certain derivatives of carbonic acid, among which are included xanthate. The boundaries of the class remain undefined.

HIS LORDSHIP: What class, Mr. Biggar?

MR. BIGGAR: The class of sulphur derivatives of carbonic acid, the use of which the plaintiff recommends.

Then, I do not think that paragraph 5 helps us or advances us
 10 very much: "The galena-bearing froth obtained with xanthates or analogous substances used at the rate of .2 pounds per ton of ore had a characteristic bright sheen like a plumbago-bearing froth and seemed to make a more coherent froth than when other materials were used on the same ore."

Then paragraph 6: "In general, the substances referred to are not mineral frothing agents,—producing only a slight scum." . . . Your Lordship will remember with regard to that, that Mr. Higgins has told us that he knows none of the substances that have been described here that are frothing agents, and that he does not know
 20 why the statement merely in general should have been made. The specification goes on . . . "and some evanescent frothy bubbles when subjected to agitation which would produce mineral-bearing froth on an ore pulp in the presence of a mineral-frothing agent." Then the rest of that paragraph deals with the effect of using those substances:

"The substances are effective in enabling a selective flotation of lead and zinc, and cause uncombined silver, if present, to tend to go into the lead concentrate rather than with the zinc, where these are separated in separate concentrates. Usually pre-
 30 agitation is unnecessary, the brightening and other effects seeming to be practically instantaneous. The pulps may be either acid, alkaline or neutral, according to circumstances."

With that last sentence I propose to deal specially on a specific point. But it does not advance us at all with regard to the scope of the invention yet.

Paragraph 7 leads us into a completely new territory, which is not xanthates at all. It is a compound which has no organic radical of any kind:

"Two sticks of caustic potash weighing perhaps fifteen
 40 grams were partly immersed in about 80 cubic centimeters of commercial carbon disulphide and kept for about ten days in a closed bottle containing some air in the warm region of the laboratory where were the hot plates used for drying. These eventually yielded a yellow or orange salt, which was used with pine oil at the rate of approximately half a pound to a ton of ore in concentrating Hibernia ore from the Timber Butte Mining

Opening Remarks of Counsel

Company. The test was with a neutral pulp and the concentrates were seen to be clean, with brightened lead sulphide particles."

We are proposing, my Lord, to give some evidence about that, and one has to keep in mind what is proposed to be used here, because it is not referred to specifically in Mr. Keller's evidence. It is referred to by a description of some stuff that he used which was prepared in exactly that way, and we will have to compare his evidence with regard to the stuff that he describes as prepared, with
 10 this; that is all. But the point that I am making now, my Lord, is that there is a very considerable extension of the scope of the invention beyond xanthates, and justifies, and indeed compels, my learned friend to put the invention as high as he did and as broadly as he did.

HIS LORDSHIP: That is in what claim in suit?

MR. BIGGAR: Well, none of the claims in suit, my Lord. But I am talking now about the description mentioned, and some of the claims contained in the patent are much broader than the claims in suit.

HIS LORDSHIP: Such as claim No. 1?

20 MR. BIGGAR: Yes, my Lord; claim No. 1 and claim No. 2. What we are concerned with just now is this: Is there a full and correct description of the invention in the disclosure?

HIS LORDSHIP: Yes. If there is not a sufficiently full and complete description to justify the broadest claims made, but a sufficiently full and complete description to justify the narrowest one, would that be a sufficiently full and complete description to comply with the requirements of the statute?

MR. BIGGAR: The way that I put it is this, my Lord. What it is the duty of a patentee to do is to describe fully and correctly
 30 what he had found out that nobody else knew before; that is the invention and its operation and use. You see, there are the two things. There is the invention that he has made and the operation and use of the invention. You gather the invention from the specification. What my point is with regard to this disclosure is that there is no description of the invention at all, that there is a description of certain reagents which the plaintiff recommends, but his invention as described here is an invention really of the use of certain sulphur derivatives of carbonic acid, in the most general terms, and that that is not a description of the invention at all.

40 Now I go on to paragraph 8, and I will ask your Lordship to consider this with some particularity, because a point of some importance arises on it. It says:

"For laboratory purposes"

It is specifically confined to the laboratory; there is no reference to commercial use.

"potassium xanthate"

Opening Remarks of Counsel

That means potassium ethyl xanthate, as Mr. Higgins told us.

“was prepared as follows:”

I need not go into the exact details. A certain amount of caustic potash was dissolved in a certain amount of ethyl alcohol in a reflux condenser.

HIS LORDSHIP: A fixed quantity of each.

MR. BIGGAR: A specified quantity of one was dissolved in a specified quantity of the other, at a given temperature. The quantity of ethyl alcohol that is specified is 3.6 times, I think Mr. Higgins
10 told us, the theoretical quantity that was required. And then he says the solution was cooled. As will appear, it has a reaction there which is exothermic. That is to say, it produces heat in making the reaction, and that is why you get a temperature of 124°. It says:

“The solution was cooled to 58°F. It contained a large excess of alcohol over the theoretical amount needed for the subsequent reactions. To this was added, while stirring, and in a cooling bath, the theoretical amount of carbon disulphide.”

Why the theoretical amount was not stated Mr. Higgins cannot explain.

20 HIS LORDSHIP: Is it among your contentions that the specification should have stated the exact amount?

MR. BIGGAR: If it stood alone, my Lord, I do not think I could make much of it, but it is one of the indications of the carelessness and vagueness and unsatisfactory character of this specification which might have been made clear, simple and definite. If it were standing alone, I do not think I would trouble your Lordship with it, but it is one of the indications of the complete incompetence with which this specification was prepared and the unsatisfactoriness of it from the point of view of an exposition of the invention.

30 The specification goes on:

“The reaction was substantially instantaneous, producing a thick pulp of potassium xanthate.”

They got two products from that thick pulp. First:

“The pulp was cooled and centrifuged in a laboratory machine, yielding crystals containing about 20% moisture.” That would be what is afterwards called the mother liquor, as Mr. Higgins told us, the 20% moisture would. The crystals would be xanthate.

HIS LORDSHIP: The moisture was in the crystals?

40 MR. BIGGAR: The moisture was included with the crystals.

HIS LORDSHIP: After the centrifuging?

MR. BIGGAR: After the centrifuging.

“The yield thus obtained was 74.7%.”

Opening Remarks of Counsel

I am afraid I cannot tell your Lordship what that 74.7% was, unless that 20% is to be increased by some 5.3%, for we do not know what the difference between 20% and 25.3% would be.

HIS LORDSHIP: It does not say what the 74.7% was?

MR. BIGGAR: No. I imagine that really it was about 20% moisture, and that the actual amount of moisture was 25.3%, the difference between 74.7% and 100%. There is another explanation of that which might be suggested as the right one, and we will perhaps direct evidence to it, although it is not a matter of great importance.
 10 It may be 74.7% of the theoretical amount of xanthate produced by the reaction.

Then it goes on:

“Another 17.5% was obtained by evaporation of the mother liquor.”

That is the alcohol and water and salts in that alcohol and water that were left after the centrifuging. That mother liquor was evaporated to obtain this extra 17.5% of xanthate. Then he goes on:

“Both the centrifuged crystals and the residue from the
 20 mother liquor gave excellent results in flotation.”
 He puts them on the same basis, subject to an exception in the next paragraph.

“It was found in cases where sulphuric acid was used that the centrifuged material yielded better results than the uncentrifuged.”

HIS LORDSHIP: I am not quite clear about that.

MR. BIGGAR: I think, my Lord, that Mr. Higgins made that perfectly clear in his evidence, when its bearing was understood. He said that when you use a sulphuric acid you get an acid circuit;
 30 and that then the purer the xanthate, the better; and the xanthate that was produced by the centrifuging was purer, had less of other materials in it, than the xanthate that was produced by evaporating the mother liquor.

HIS LORDSHIP: So the uncentrifuged portion means the portion that was subjected to evaporation, the portion that was left after the centrifuging.

MR. BIGGAR: Yes, I think that is a fair way to interpret that paragraph.

HIS LORDSHIP: That is a description of how the potassium
 40 xanthate was prepared.

MR. BIGGAR: Yes, my Lord, for laboratory purposes.

HIS LORDSHIP: Xanthate is not claimed as a new substance?

MR. BIGGAR: Not at all.

HIS LORDSHIP: Xanthate was a well known substance?

Opening Remarks of Counsel

MR. BIGGAR: Yes, my Lord. As a matter of fact, we have an exhibit, D-61, which is a summary of the publications.

HIS LORDSHIP: And Mr. Higgins was not familiar with the publications?

MR. BIGGAR: No. But we are going to show—I am referring to evidence we shall give as well as to evidence that has been given—

MR. GOWLING: My Lord, if I may interrupt, with respect to this exhibit, I think there has been some misunderstanding as to our position on that.

10 MR. BIGGAR: I will not refer to it now.

MR. GOWLING: But I would like to make this clear. The reason Mr. Higgins said that he was not familiar with the publications was that they were mostly in German; and my friends indicated to us that they were not going to use the majority of them, so we did not bother studying them.

MR. BIGGAR: As a matter of fact, my Lord, there are none of the significant ones in German. They are contained in two things: in the original publication, and in an abstract that is published annually in English. That abstract gives the information.

20 HIS LORDSHIP: In its present state the exhibit does not prove anything.

MR. BIGGAR: That is quite true, my Lord. But we are going to prove that all those xanthates had been prepared and their publication published before.

HIS LORDSHIP: Is there any controversy on that? There is no claim made with respect to the substance?

MR. BIGGAR: No, my Lord, there is no doubt about that. That is simply a question of interpretation of the claims, really.

The rest of the specification consists merely of a series of examples.

30 HIS LORDSHIP: A series of experiments conducted.

MR. BIGGAR: A series of experiments conducted, yes.

HIS LORDSHIP: Is there any obligation on the part of the applicant for a patent to describe in his specification the experiments leading up to the discovery or that were made in the course of his making the discovery?

MR. BIGGAR: On the contrary, he need not give any examples at all, if he does not want to.

HIS LORDSHIP: And he need not indicate tests that he made?

40 MR. BIGGAR: No. But he has got to give a full and correct description of the operation and use of the invention. And there are cases in which that can best be done by giving examples of this kind.

HIS LORDSHIP: May it be, then, that while he does not in so many words say, "This is my invention," the invention may appear through his description of tests and experiments?

Opening Remarks of Counsel

MR. BIGGAR: I would rather say that these examples given in the patent may be a very useful way of indicating the operation and use of the invention, as contemplated by the inventor.

HIS LORDSHIP: They may be applicable in respect of that portion of the statutory requirement?

MR. BIGGAR: Exactly, my Lord.

HIS LORDSHIP: And yet fall short of constituting a full and complete description of the invention?

MR. BIGGAR: That is exactly the point. And I do not think they
 10 advance us at all here, because we are told in paragraph 4 that this constitutes a disclosure in some detail of the invention as carried out with a very broad class of things, namely, "salts of the sulphur derivatives of carbonic acid containing an organic radical, such as an alkyl radical, and known as xanthates." And actually all these examples are confined to two particular xanthates: potassium ethyl xanthate and sodium ethyl xanthate. So we are really not advanced here by the examples, as they do not convey anything about the description of the invention. What we really find with this disclosure
 20 is that the inventor approached again and again the question of giving a description of his invention, and each time he was very careful to sheer off, so that, as Lord Loreburn said, he could according to the circumstances afterwards contend that his invention was a narrow one or that it was a very broad one.

My friend Mr. Gowling, according to my note, has stated that Keller proposed new flotation agents in the group known broadly as sulphur derivatives of carbonic acid, including a large number of compounds in the chemical class known as xanthates. He did not refer to the chemical class of the compounds such as are described in
 paragraph 7.

30 MR. GOWLING: I do not think I have been correctly quoted, my Lord.

HIS LORDSHIP: My recollection is that Mr. Gowling made it perfectly clear in his opening that the invention was the use of mineral-frothing agents in the presence of xanthates.

MR. BIGGAR: He said that those were the claims sued on. He did not say that that was the scope of the invention. As a matter of fact, claims 1 and 2, as I shall point out to your Lordship when we come to them, are very much wider than that.

HIS LORDSHIP: But that the claims in suit and the invention in
 40 suit—

MR. BIGGAR: No, my Lord, not the invention in suit, but the claims in suit, which is quite a different thing. I am now on the point of the description of the invention.

HIS LORDSHIP: That is what I had in mind a moment ago when I put the question to you. I may not have put it correctly. In this case we are concerned only with the claims in suit.

Opening Remarks of Counsel

MR. BIGGAR: We are concerned with the specification as a whole, and we are concerned to ascertain whether the specification as a whole, and particularly for this purpose the disclosure, complies with the statutory requirements.

HIS LORDSHIP: My question was directed to whether you could have a situation where the disclosure falls short of complying with the statutory requirement in respect of some of the claims, for example, and the claims might have to go on that ground, but that in respect of other claims there might be a sufficient compliance with the statute.

10 MR. BIGGAR: At the moment, my Lord, I was not intending to discuss the claims at all. There are three duties on a patentee: first, to describe the invention in the disclosure; secondly, to describe its operation and use in the disclosure; and, thirdly, to make claims. At the moment I am really only on the first point.

HIS LORDSHIP: I understand that. But I was wondering whether these duties are not related to one another.

MR. BIGGAR: On the cases that I have cited to your Lordship I think there is a clear duty to indicate the extent of the invention in the disclosure.

20 HIS LORDSHIP: What I was wondering was whether the duties laid upon the inventor are relative to the claims.

MR. BIGGAR: They have been dealt with again and again separately. For example, in *Smith v. Seiling*, (1937) S.C.R. 251, Chief Justice Duff, speaking for the Court, said there are cases when we do not need to look at the claims at all, that if we find the defendant has not done the thing which in the disclosure the plaintiff has said is the invention, we need not have any regard for the claims and we can dismiss the action because the defendant has not taken the invention described. Now, this is rather a kind of converse of that. Here the
30 patentee has, as it were, taken all out-doors, all the prairie without any fences, as a description of his intention, and then has said, "My monopoly is confined to so-and-so and so-and-so." My submission to your Lordship is that that is just as bad as any other bad description of the invention and its operation and use. You cannot say "My invention is everything out-doors, but I claim so-and-so," and comply with the first part of section 14.

My submission on that specification is that nobody can tell what sulphur derivatives of carbonic acid the patentee recommends the use of. All you can gather from it is that there are certain sulphur
40 derivatives of carbonic acid which with certain ores he thinks will be useful, and that that is not a description of the invention or of its operation and use as he contemplated it. That is my submission on that point to your Lordship.

Your Lordship will observe how careful he is on that point if you look at the last part of the specification, paragraph 22:

Opening Remarks of Counsel

“Having thus described certain embodiments of the invention, what is claimed is:”

There is not even an allegation on his part that he has described the invention or its operation and use fully and correctly.

HIS LORDSHIP: You say that the applicant himself does not even pretend that he has given a description of the invention.

MR. BIGGAR: He does not pretend that he has given a description of the invention nor of its operation and use as he contemplated it. He begins by saying, in paragraph 4, “I have described my invention in some detail by reference to so-and-so and so-and-so.” Then in 10 paragraph 7 he says, “I got results of a certain kind with a class of substance that is not of the kind described in paragraph 4 at all.” Then finally he says, “I have described certain embodiments of my invention, and I claim so-and-so.” But there are two groups, not groups of equal size, but two completely distinct groups of compounds that he recommends for use.

HIS LORDSHIP: Those are what?

MR. BIGGAR: Those are the xanthates, which are referred to in paragraph 4, and the compounds, which are prepared according to 20 paragraph 7, and which are not xanthates. He says, in paragraph 4, “I have given examples of my invention by reference to xanthates.” Then in paragraph 7 he says, “I got results with a certain kind of ore with these other compounds, the ore being Hibernia ore from Timber Butte Mining Company.” Then he closes his whole specification by saying, “Having shown certain embodiments, I claim so-and-so.”

So, in my submission, you are left completely at sea as to what this invention is. That covers the point I want to make on the specification as a whole, and in regard to sub-rule 2.

30 HIS LORDSHIP: When you were stating the particular rules I had in mind to ask you when you had finished the statement of those rules I had in mind to ask you when you had finished the statement of those rules to specify your contentions as to the respects in which the applicant had violated those rules.

MR. BIGGAR: That is what I am proceeding to do now.

HIS LORDSHIP: I was going to ask you to deal with that under each one of the rules that you mentioned.

MR. BIGGAR: That is what I intend to do.

40 HIS LORDSHIP: And ask you to specify exactly what your contention is as to how the particular rule that you are dealing with has been violated.

MR. BIGGAR: Quite so. That is what I intended to do. The next rule that I propose to take—

HIS LORDSHIP: You have given me the details of your contentions as to the violations of the first rule.

Opening Remarks of Counsel

MR. BIGGAR: No, of No. 2, my Lord. You will remember I said I was not taking them in the exact order. Sub-rule 1 is the one about misleading statements.

HIS LORDSHIP: I beg your pardon.

MR. BIGGAR: I have dealt with it that way because it came better in logical order with the specification as a whole under sub-rule 2.

HIS LORDSHIP: Sub-rule 2 is the one which you stated to be that the disclosure must be full and correct.

10 MR. BIGGAR: Full and correct, that is the disclosure of the invention and description of the invention.

HIS LORDSHIP: Must be full and correct.

MR. BIGGAR: Yes, my Lord. That is the invention really and its operation and use, is it not? I think the two of them go together.

HIS LORDSHIP: And that failure to make such disclosure would make the patent bad for insufficiency.

MR. BIGGAR: For insufficiency and failure to comply with our statute.

HIS LORDSHIP: Insufficiency, yes.

20 MR. BIGGAR: Now I am proceeding to deal with two instances of failure to comply with sub-rule No. 1, misleading statements.

HIS LORDSHIP: You stated the specific rule as being that the disclosure must contain nothing that is positively misleading.

MR. BIGGAR: Yes, my Lord. I am going to submit there are two statements in this specification that are so.

HIS LORDSHIP: That there are two statements in the specification?

MR. BIGGAR: Yes, that are so. The first of the statements is the statement implied that useful results can be obtained with a compound
30 prepared in accordance with paragraph 7.

HIS LORDSHIP: What is that again?

MR. BIGGAR: The statement implied that useful results can be obtained with a compound prepared in accordance with paragraph 7. Your Lordship will remember that Mr. Higgins has told us—

HIS LORDSHIP: That is what?

MR. BIGGAR: Caustic potash and commercial carbon disulphide. Your Lordship will remember Mr. Higgins has told us that the chief ingredient—I think he said two-thirds of the compound resulting from following that process—was thio-carbonates. On that point I should
40 like to refer your Lordship to a letter written by Lewis, one of the original joint inventors or joint applicants for the Keller patent, to Nutter, the chief engineer of the plaintiff company, on August 4, 1923. It is not yet marked as an exhibit, but might conveniently be so now. It is production No. 228, and I think it will be exhibit D-80.

HIS LORDSHIP: D-80.

Opening Remarks of Counsel

EXHIBIT D-80: Filed by } Letter dated August 4, 1923 from
 } Mr. Biggar } Lewis to Nutter.

MR. BIGGAR: I think it will do to read only the second paragraph, my Lord.

10 “As I remember the tests made in the San Francisco office, using thio-carbonate as a reagent, showed a non selective action on the same minerals, while it has been proven that the xanthate has the opposite effect, e.g., the selection of chalcocite over pyrite. An aqueous solution of the material new being used shows a
 20 decided orange colour—the distinctive colour of thio-carbonate, whereas properly made xanthate shows a decided lemon yellow. There is no doubt an excess of xanthate in the material on hand, but in my opinion the amount of thio-carbonate present is sufficient to partially mask the xanthate effect and cause the tailing in the present tests to run from .1 to .2 higher than was within reason to expect.”

As a matter of fact, my Lord, that letter is in the course of the correspondence dealing with the production of a purer xanthate, to which I shall have occasion to refer your lordship.

20 HIS LORDSHIP: That letter is written on August 4th, 1923?

MR. BIGGAR: Yes, my lord.

HIS LORDSHIP: Is that prior to the application?

MR. BIGGAR: Yes, my Lord; the application was on October 23, 1923. We shall be giving evidence to confirm Mr. Higgins' statement that it is thio-carbonate that you get from following the directions in paragraph 7, and also to show that the thio-carbonates prepared in this way were of no value whatever. In this connection I ought to call your Lordship's attention to the fact that this patent as applied for did not contain this paragraph 7 at all. It was added by an amendment in the
 30 course of the prosecution of the United States application in March.

HIS LORDSHIP: The patent as applied for did not contain paragraph 7.

MR. BIGGAR: It did not contain paragraph 7, my Lord. It was contained in an amendment which is undated but was received by the Patent Post Office on the 28th March, 1924. I think I am right in saying that. Your Lordship will find it at folio 13 of exhibit K-47.

HIS LORDSHIP: Yes.

MR. BIGGAR: Your Lordship will find that on page 3, after line
 40 10 insert the following, and a whole paragraph is inserted. If your Lordship will observe the remarks which are two pages on, and I am referring to a passage three pages on at folio 16—there is a rule in both the United States and Canadian Patent Offices that no new matter can be inserted after the application. I mean what has been discovered subsequent to the application must be made the subject of another patent application. You cannot bring your patent application

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up to date while it is running. Your Lordship will observe that the attorneys who were prosecuting this, Messrs. Williams and Pritchwood, in the paragraph that begins at folio 16 begin by saying, "the amendments to the specification"—

HIS LORDSHIP: "Consist merely in adding examples."

MR. BIGGAR: Merely adding examples to the practice of the invention, so that as your Lordship will hear in the course of the case there were commercial experiments going on, or had been commercial experiments going on from somewhere about June, 1923 and continued
10 no doubt through the winter of 1924, though we are not given those as examples. Apparently this was put in on the basis of it being added examples of the use of the invention.

HIS LORDSHIP: And your contention is that the statements contained in it are positively misleading?

MR. BIGGAR: Positively misleading because the material produced in this way does not lead to the results promised, to useful results. It is misleading because it recommends something that is no good, quite shortly, my Lord.

HIS LORDSHIP: Does it say anything about the results?

20 MR. BIGGAR: It does not except that the only conceivable reason for putting it into the specification was either to recommend its use in flotation or to confuse the trail. I don't know which.

HIS LORDSHIP: Where is the misleading statement contained in that paragraph?

MR. BIGGAR: The point—

HIS LORDSHIP: The positively misleading statement contained in that paragraph.

MR. BIGGAR: The point might be put alternatively under the other rule, my Lord. Very many of these points can be related to one
30 or other of the rules that I stated. It might be put under some other rule but it is convenient to deal with it there. It is inferentially misleading.

HIS LORDSHIP: But not positively misleading.

MR. BIGGAR: Positively because there is a positive inference, that is all.

HIS LORDSHIP: It depends on who draws the inference.

MR. BIGGAR: That is right, but I simply put it—

HIS LORDSHIP: I would take a positively misleading statement as some specific statement.

40 MR. BIGGAR: Well, I would not quarrel with that at all. I am perfectly satisfied. The point I am really making is that that in effect recommends the use of the useless material.

HIS LORDSHIP: Where is the recommendation to be found?

MR. BIGGAR: The recommendation is to be found by finding that in the specification as a material which according to the records was

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an example of the use resulting, the practice; at all events, that it has no purpose except as a recommendation to use it. That is perhaps the strongest way that I can put it.

HIS LORDSHIP: I cannot find any specific recommendation to use it.

MR. BIGGAR: I cannot press it any higher than that.

HIS LORDSHIP: It is just an inferential recommendation?

MR. BIGGAR: It has no significance at all in my submission unless it is a recommendation to use it.

10 HIS LORDSHIP: It has no significance unless it is to be construed as a recommendation to use it.

MR. BIGGAR: That is all; I cannot put it higher than that.

HIS LORDSHIP: The question I wanted to put to you was in what respect did that statement constitute a positively misleading statement?

MR. BIGGAR: Because of its being nothing but a recommendation to use a useless material it misleads the fellow who is trying to put the invention into operation. That is really what it is. I am not using the word "misleading" in the sense of a misstatement of fact. I am using
20 the expression "misleading" in the sense of having the effect of misleading somebody who tried from the specification to use the invention. That is really the way I am putting it, putting him off the track.

HIS LORDSHIP: Confusing.

MR. BIGGAR: Confusing, misleading; the choice of the word does not matter very much but the point is that it does direct him away from the obtaining of successful results. That is all.

HIS LORDSHIP: Then you said that there were two such statements.

30 MR. BIGGAR: Yes. The second one is at the end of paragraph 6—I think I am right about that paragraph number—where it says, "the pulps may be either acid, alkaline or neutral according to circumstances."

Dealing with the point that your Lordship has just raised, that in essence is nothing more than stating that some flotation is done with acid circuits, some flotation is done with alkaline and some with neutral. I mean, with the statement of fact that you may find neutral, alkaline or acid pulps, I cannot quarrel at all. The ground upon which I am quarrelling with it is that inferentially it says that
40 this invention, as disclosed, is of equal value and operates in the same way in each of these three classes of circumstances; but there is no distinction between them.

HIS LORDSHIP: I did understand that it was claimed that the xanthates accomplished the results with practically any kind of ore and with practically any kind of mineral frothing agent.

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MR. BIGGAR: And in any kind of a circuit, whether it had sulphuric acid added to it or whether it had an alkali added to it or whether it was neutral.

HIS LORDSHIP: Well, I do not remember that statement being made. But I do remember Mr. Gowling's statement in the course of his opening that it was claimed that if the flotation process was carried out in the presence of a xanthate, potassium xanthate or sodium xanthate, it did not much matter what kind of ore it was and it did not matter what kind of mineral frothing agent he was using. But I
10 do not recall any statement being made by Mr. Gowling as to whether it made any difference whether the ore pulp was acid, alkaline or neutral.

MR. BIGGAR: The other points, for this purpose, I can leave aside. But the point I am making on this is that this statement really indicates, and can only indicate, that this invention really works equally well in any of these three classes of circuits.

HIS LORDSHIP: Of circuits?

MR. BIGGAR: Of circuits, not ores, my Lord.

HIS LORDSHIP: Oh, I see. And you are interpreting this state-
20 ment to that effect?

MR. BIGGAR: That is it, my Lord—that it has no significance—

HIS LORDSHIP: That the xanthates can be used equally effectively?

MR. BIGGAR: I do not like to say "xanthates." I prefer to say the sulphur derivatives of carbonic acid.

HIS LORDSHIP: The sulphur derivatives of carbonic acid can be used whether the ore pulp is acid, alkaline or neutral.

MR. BIGGAR: And as Mr. Higgins told us, that means really almost, for practical purposes and subject to some slight oxidation,
30 whether sulphuric acid has been added to the pulp to make it acid or whether alkali, for example lime, has been added to the pulp to make it alkaline, or whether it is left alone as it may ordinarily be, except in the case of a slight oxidation of some ore, and is neutral.

HIS LORDSHIP: Yes. Perhaps we might recess now for ten minutes.

MR. BIGGAR: Very well, my Lord.

—The Court took recess at 11:50 A.M.

—On resuming at 12:00 o'clock:

MR. BIGGAR: My Lord, I was dealing with the statement with
40 regard to the pulps, the statement that the pulps might be either acid, alkaline or neutral according to circumstances.

HIS LORDSHIP: Is that any more than a mere statement of fact?

MR. BIGGAR: My submission is that that is really meaningless, unless the inference is drawn from it that there is no difference in the

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use of these reagents in the three circuits. Your Lordship may come to the conclusion that it is a question of the interpretation of the specification, and your Lordship may come to the conclusion that that was merely a statement within the patent corresponding to that which Mr. Higgins made to us, that sometimes these pulps were acid, sometimes they were alkaline and sometimes they were neutral. As a matter of fact, there is evidence in the Commission that it was routine to try a reagent in those three types of circuit. But my submission is that that cannot be restricted to a mere statement that

10 there were in use those three types of circuits; that when it appears in the specification at the point at which it does, as to the results of using these agents—and that is what the paragraph deals with, paragraph 6—it must mean that there is no distinction to be made in the use of these reagents in those three types of circuits. It is on that basis that I am submitting it.

On that point, my Lord, I want to refer to a letter from Keller to Nutter dated the 11th of May, 1923, which is exhibit K-4. I am going to refer to page 2 of it, at the bottom.

MR. GOWLING: Do you know which production of ours that is?

20 MR. BIGGAR: It is exhibit K-4 on the Commission. Your Lordship will find the paragraph to which I am referring at the bottom of page 2 of that letter. It is the last complete paragraph on the page. He says:

“The xanthates were found to be effective in acid, alkaline, and neutral circuits.”

Have I identified it sufficiently, my Lord? It is the last paragraph on the page.

HIS LORDSHIP: On the first page?

MR. BIGGAR: No, my Lord; on the second page.

30 HIS LORDSHIP: Yes, I have it.

MR. BIGGAR: He says:

“The xanthates were found to be effective in acid, alkaline, and neutral circuits. No advantage was gained by the use of acid or alkali. Their use did not apparently affect the action of the xanthates, except for the expected deflocculation by the acid making for higher oil consumption, longer treatment period, and high soluble copper loss in tailing filtrate.”

So that actually he knew that there was some difference but it did not affect the action of the xanthates.

40 The next relevant thing in connection with that is again on the United States file wrapper, Exhibit K-47; and I am going to refer to pages 18 and following pages; that is, folio 18 and following pages. They are called folios.

I am afraid that first I must refer to an earlier one. It is folio 10, and is a communication by the Commissioner of Patents to the

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attorneys, addressed to Williams & Pritchard. Does your Lordship find it?

HIS LORDSHIP: January 12, 1924?

MR. BIGGAR: My copy has not any date on it, my Lord. The communication begins: "Please find below a communication—"

HIS LORDSHIP: "—from the Examiner in charge of the application of Keller and Lewis."

MR. BIGGAR: That is it, my Lord. Then, as you will see, he says:
 10 "The case, above referred to, is adjudged to interfere with others, hereafter specified, and the question of priority will be determined in conformity with the Rules."

HIS LORDSHIP: Yes.

MR. BIGGAR: Then he says: "The statement demanded by Rule 110 must be sealed up and filed on or before March 3, 1924, with the subject of the invention, and name of party filing it, indorsed on the envelope. The subject matter involved in the inference is"

Your Lordship sees that what follows is the setting out of twelve
 20 claims or things in the form of claims; and the distinction between them is that some of them specify an alkaline circuit and some of them do not specify an alkaline circuit. For example, you will find one of the most striking alkaline ones in number 10:

"The improvement in the concentration of minerals by flotation which comprises subjecting the mineral in the form of a pulp made alkaline by the addition of lime to a flotation operation in the presence of potassium xanthate."

HIS LORDSHIP: Yes, Mr. Biggar.

MR. BIGGAR: Then your Lordship will find that that was dealt
 30 with by affidavits of both Lewis and Keller at folio 18 and pages following. On folio 18 there is a petition then filed by Keller alone instead of the joint petition with which the application was commenced on the 23rd of October preceding, and also a separate petition—

HIS LORDSHIP: The one filed by Keller and consented to by Lewis?

MR. BIGGAR: I was going to say, "and consented to by Lewis and by the assignee."

HIS LORDSHIP: Yes, I have it.

MR. BIGGAR: And then on the next page, 19—

40 HIS LORDSHIP: There is an affidavit by Lewis.

MR. BIGGAR: Yes. At the end of the introductory part of the affidavit, he refers to his having "joined with said Cornelius H. Keller in executing and filing the said application, including the oath sworn by said applicants as a part of said application, under the mistaken belief that he and the said Cornelius H. Keller were joint inventors

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of the invention described and claimed in said application and without fraudulent or deceptive intent; that he has since the declaration of interference No. 50,394 involving the said application and an application of Ralph E. Sayre, as the result of careful consideration of the facts in relation to the origination and development of the said invention, reached the conclusion that he is not a joint inventor and that he did not in any way participate in the invention described in said application and claimed in claims 1, 2, 3, 4, 5, and 6 thereof, i.e. all the claims of said joint application as filed . . .” That is, originally.

10 One of these is the claim 6 sued upon, but the others are not. Continuing:

“—i.e. all the claims of said joint application as filed, and claims 7, 10 and 13 of said application . . .”

None of those are sued upon.

HIS LORDSHIP: Except 7.

MR. BIGGAR: No, my Lord. My recollection is that 7 is one of these. No, I am wrong. Your Lordship is quite right.

HIS LORDSHIP: 7 is one of the claims in suit?

MR. BIGGAR: Yes. It is one of the claims in suit.

20 HIS LORDSHIP: 6, 7, 8, and 9.

MR. BIGGAR: Yes. Continuing:

“. . . which were suggested by the Patent Office and inserted by amendment preliminarily to the declaration of said interference, and that he is the sole inventor of the invention described in said application and claimed in claims 8, 9, 11, 12 and 14 thereof, which were suggested by the Patent Office . . .”

No, my Lord. 7 is not one of the ones sued upon. 7 in the list is one in which the pulp is made alkaline by the addition of lime.

30 HIS LORDSHIP: By the addition of lime. And that is not in suit?

MR. BIGGAR: That is not our 7 at all.

HIS LORDSHIP: That is not the 7 in suit?

MR. BIGGAR: No. Our present 7 is No. 5 of those suggested by the Patent Office.

HIS LORDSHIP: Yes, Mr. Biggar.

MR. BIGGAR: And the same kind of affidavit is made on the following page, 21, by Keller himself. I need not repeat the introductory part, but if your Lordship comes down towards the end of the page you will find this:

40 “. . . reached the conclusion that he is the sole inventor of the invention described in said application and claimed in claims 1, 2, 3, 4, 5 and 6 thereof, i.e., all the claims of said application as filed, and claims 7, 10, and 13 of said application—”

That is, as filed.

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“—which were suggested by the Patent Office and inserted by amendment preliminarily to the declaration of said interference, and that he is not the inventor and did not participate in the invention described in said application and claimed in claims 8, 9, 10, 12 and 14 thereof which were suggested by the Patent Office and inserted by amendment . . .”

Then he reiterates the usual inventor's affidavit. And two patents were issued. I am going to direct your Lordship's attention to the difference between those two patents.

10 HIS LORDSHIP: Two United States patents issued?

MR. BIGGAR: Yes; one issued to Keller and the other issued to Lewis. Both of them are identical with the corresponding Canadian patents.

HIS LORDSHIP: Both are identical?

MR. BIGGAR: Yes. The Lewis patents are not in, and perhaps it would be convenient to have them marked at this stage. The Lewis United States patent is No. 1,154,220, applied for on March 27, 1924, and issued on September 22, 1925.

20 EXHIBIT D-81: Filed by } Lewis United States Patent No.
Mr. Biggar } 1,154,220.

The Lewis Canadian patent is No. 247,791, applied for on the 23rd of October, 1924—that is, on the same date as the Keller Canadian patent—and issued on the 17th of March, 1925.

EXHIBIT D-82: Filed by } Lewis Canadian Patent, No.
Mr. Biggar } 247,791.

Now, if your Lordship will turn to the Keller patent in question I will show you what has been omitted from it in the Lewis patent. The two specifications are in almost every respect identical. It is a very curious thing. It does not matter whether your Lordship
30 refers to the United States print of the Lewis patent or to the Canadian certified copy, because the United States and Canadian patents to Lewis are so completely identical that the Canadian patent refers to the United States serial number of the other patent, not to the Canadian.

HIS LORDSHIP: Likewise, the specifications of the Keller patents, Canadian and United States, are the same?

MR. BIGGAR: Yes. Looking at the Keller patent, the one difference between the two—perhaps I had better not put it that way, because it will be more convenient to refer to the omissions from the
40 Keller Canadian patent—

HIS LORDSHIP: You are still dealing with the point that there was a positively misleading statement in the Keller patent?

MR. BIGGAR: Yes, my Lord. It is on that point of alkali and acid. I will indicate to your Lordship what passages of the Keller Canadian patent have been omitted from Lewis, and then I will

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indicate what passages in Lewis are not in Keller. That will be the most convenient way of doing it. Taking the Keller Canadian patent in suit, the first omission is that statement we are on. The Lewis patent does not contain the statement that the pulps may be acid, alkaline or neutral, according to the circumstances.

The next thing that Lewis does not contain is paragraph 7 of Keller. I can give your Lordship the other paragraphs of Keller that are omitted, for they are full paragraphs: paragraph 9 of Keller is omitted; paragraphs 13 and 14, 18, 19, 20 and 21 of Keller are omitted. The
10 claims, of course, are different in both.

HIS LORDSHIP: Otherwise the description is the same in the two?

MR. BIGGAR: Subject to what I am going to say to your Lordship in regard to certain fresh material that is included in Lewis. If you number the paragraphs in Lewis in the same way as we have numbered them in Keller, the fresh material that is included in Lewis is, first, paragraph 4, that is the paragraph beginning, "The present applica-
20 tion is in part a continuation . ." That is in both the United States and Canadian patents to Lewis, notwithstanding that it is perfectly untrue so far as the Lewis Canadian patent is concerned. There never was a joint Keller and Lewis Canadian application.

The next paragraph is equally an insertion. That is the paragraph reading:

"According to the present invention these sulphur derivatives of carbonic acid may be used in alkaline ore pulps or in ore pulps in which alkali has been added, and this or other procedure may be used to effect differential flotation of the various metalliferous minerals of complex ores."

So at the very beginning he really confines it to alkaline pulps.

The next insertion in the Lewis patent is a paragraph which is
30 a good deal further on—on page 6 of the Canadian patent—the paragraph beginning:

"In one test a freely flowing pulp . . ."

That paragraph, and the next, and the next are all new, as are also the succeeding paragraphs down to the very last but one. In other words, there are a number of new examples given. One may say that everything from that paragraph down to, but not including, the last paragraph of Lewis is fresh in Lewis.

Your Lordship will observe that substantially, with regard to
40 the invention originally applied for by Keller and Lewis jointly in the United States on October 23, 1923, there is no more information given in either of those specifications than there is in the other. Yet they are directed, as they say, to two inventions which, according to their affidavits, were separately and individually made by the two inventors.

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Now I am coming to a point which I think it would be better to leave until I come to deal with it, that is going to show what the difference between acid and alkali circuits was. All that I need do in making my point at this stage is to make two remarks. In the first place, there was some difference that they knew of on the 23rd of October, 1923, between alkali and acid circuits, a difference about which they gave no information whatever, with one exception, namely, that the centrifuged material worked better in acid circuits than the uncentrifuged did. The other remark is that three of the
 10 four claims in Keller that are sued upon suggest that distinction.

HIS LORDSHIP: Yes, they certainly do suggest it.

MR. BIGGAR: Because they are all confined to non-acid pulps.

HIS LORDSHIP: Yes.

MR. BIGGAR: That is all I have to say on that, my Lord. I submit that in view of there being some distinction which is not made in the Keller patent, a distinction of which they knew and which Keller said was not his invention, this patent is clearly bad.

HIS LORDSHIP: As containing a misleading statement?

MR. BIGGAR: A misleading statement. If it is not misleading,
 20 it is an omission of necessary information or of useful information. I put it as high as misleading, but I do not need to put it as high as that. It depends upon what view your Lordship takes of the interpretation of the patent. If a sentence from Keller really does suggest that there is no difference, as I submit it does, then it is misleading.

HIS LORDSHIP: That is my first reaction on reading it.

MR. BIGGAR: I am taking it that that is an interpretation that is open. If your Lordship takes that view, then I say they omitted to give some information that was necessary with regard to that distinction. And finally I say—because I am going to show that they
 30 knew all about what the distinction was before they made any application of any kind—that they failed to give what was useful information that they had.

HIS LORDSHIP: And so violated the third and fourth sub-rules that you referred to?

MR. BIGGAR: Yes. I put it, first, that they violated sub-rule 2; and if not sub-rule 2, then sub-rule 3; and if not sub-rule 3, then sub-rule 4. I get them on one or other of the three. But of course I have not yet given your Lordship the full facts as to what the difference was. To that I am coming.

40 HIS LORDSHIP: Those are the two statements that you referred to as being positively misleading?

MR. BIGGAR: Yes, my Lord.

Now I come to the point as to what was the difference between the acid and alkaline circuits, which information they knew and did not give. I put this alternatively under either sub-rule 3 or sub-rule

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4. I think it justifies being put under sub-rule 3; but since they had the knowledge, it is immaterial, because whether your Lordship takes the view that it was necessary and should have been disclosed in any event, or that it was merely useful and should have been disclosed if they knew it, does not matter, because they did know it. It relates, what I am going to say, to paragraph 8 of the patent, the mode of preparing potassium ethyl xanthate.

HIS LORDSHIP: For laboratory purposes.

10 MR. BIGGAR: No; for the purpose of the invention. Your Lordship will find that the mode that is described in paragraph 8 is the mode that Keller used when he first thought of using xanthates, on September 18, 1922. He describes it in his evidence, at Q. 404 to Q. 410, commencing at the bottom of page 160:

20 “Q. 404. And finally, Mr. Keller, you and Mr. Lewis also did some work in pursuance of the entry you made on September 18th, 1922, with respect to the mixture of carbon disulphide and alcoholic potash, didn't you? A.—Yes, we carried out some. Q.—405. You carried out some tests? A.—Some tests. Q. 406.—And you told us before that you made some xanthate within a few days of the making of that entry. How did you prepare the xanthate? A.—I dissolved potassium hydroxide in an excess of alcohol; to this solution I added carbon disulphide from a measuring cylinder, and when the reaction terminated I measured the amount of carbon disulphide which I had added, cooled the material, and centrifuged it to eliminate the excess alcohol, which contained some xanthate, of course, as xanthate is somewhat soluble in alcohol.

Q. 407.—You say you cooled the material. In what form was the material then? A.—The material after cooling?

30 Q. 408.—Before. A.—Before cooling it was in a mushy condition.

Q. 409.—And after centrifuging? A.—A yellowish, cream yellow salt resulted—a crystalline mass, salt.

Q. 410.—What did you know of xanthate at that time? A.—Not very much. I knew that xanthate had been used for pest control. Aside from that I did not know of any use of the material.”

40 The significance of that, my Lord, is that the description of the preparation of the xanthate that he then made corresponds exactly with paragraph 8 of the patent except that it does not deal with the subsequent centrifuging.

We come then to a later date, March 2, 1923, and I would refer your Lordship to Mr. Keller's evidence, at the bottom of page 149:

“Q. 325.—And when was the first formal test made with it? And by 'formal test' I mean a test in a laboratory flotation

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machine, as a result of which concentrates were taken off and the products assayed, and the experiment and its results written up formally in the laboratory record. A.—The first test, formal test, was run March the 2nd, 1923.”

The preceding questions on page 149 indicate that this was really the same material as was referred to in Q. 404 to Q. 406.

Now, my Lord, we come to a time about this, but we do not know the date exactly, when they gave their first order for commercial potassium ethyl xanthate. The evidence is in Keller, questions 552 to 554
10 at page 179. It is towards the bottom of page 179, my Lord.

“Q. 552.—Did Minerals Separation find it necessary for the purpose of introducing this reagent in the field to insure a supply of the material from some manufacturer? A.—Yes, it did.

Q. 553.—Were arrangements made with a local manufacturer for a supply of the substance? A.—Yes, an arrangement was made.

Q. 554.—What was the company? A.—The Great Western Electro-Chemical Company.”

Then, your Lordship, we turn to question 864 which is toward
20 the bottom of page 232. He is talking about xanthate and he was asked in re-examination:

“RDQ. 864.—You had to show the Great Western Electro-Chemical Company how to make it, didn't you?

BY MR. SMART: Well, obviously that is leading, and I will object to the question in that form. A.—No. I had to show them how to make a purer xanthate for my purpose.”

The efforts that he made to get a purer xanthate are dealt with by him later still in the re-direct examination at questions 901 to 905 which begin at the bottom of page 238.

30 “RDQ. 901.—After March 2nd, 1923, there were intensive experiments with pure xanthate, were there not? A.—There were.

RDQ. 902.—These were the only experiments of which laboratory records were kept and assays made? A.—That is correct.

RDQ. 903.—Was it during the few months after March, 1923, that the controversy which you had with Dr. Rosenstein, to which you made reference, took place? A.—It was.

RDQ. 904.—Was it your position in the controversy that
40 Dr. Rosenstein's method was not calculated to produce sufficiently pure xanthate? A.—It was.

RDQ. 905.—And much of your energies were directed to getting Great Western to adopt a method which would produce pure material? A.—They were.”

Rosenstein was the chief chemist of the Great Western. I am going to refer your Lordship to the correspondence to which this

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evidence relates. Then, in the early part of May your Lordship will find in a new exhibit some rather interesting notes. The exhibit is K-4. It is a memorandum from Mr. Rosenstein of the 11th May.

HIS LORDSHIP: The 11th May, 1923—no, that is not what I have got.

MR. BIGGAR: I have misstated it if I said it was a communication from Rosenstein.

HIS LORDSHIP: From Keller and Lewis to Nutter.

MR. BIGGAR: Yes, my Lord. It is in this long table that is
10 attached to that and forms part of it. It is a double barrelled thing. If your Lordship will observe, about three-quarters way down the front page you will see it is in test No. 70, I think it is.

HIS LORDSHIP: Yes.

MR. BIGGAR: If you carry your eye right across to the remarks column you will see what was used in that was C.P.—

HIS LORDSHIP: C.P. sodium xanthate.

MR. BIGGAR: C.P. sodium xanthate. There will not be any
20 dispute that C.P. means chemically pure sodium xanthate, and the same thing with regard to potassium xanthate at about the same place on the next page. It is test 4A. Just to get this clear the dates of these are shown somewhere, but at all events we can refer to it by reference to the letter of which it forms a part, which letter is dated the 11th May, 1923. Now we go to a memorandum of Rosenstein's on the 10th May, 1923, which is not yet an exhibit. It is production 214.

HIS LORDSHIP: What date?

MR. BIGGAR: May 10th, 1923.

HIS LORDSHIP: Rosenstein to whom?

MR. BIGGAR: Production No. 214.

30 HIS LORDSHIP: Rosenstein to whom?

MR. BIGGAR: It was Rosenstein to Nutter, I think, my Lord. It was one of the group that was put in yesterday and is exhibit D-62.

HIS LORDSHIP: D-62.

MR. BIGGAR: I just wanted to mark my copy so that I would know. Your lordship sees that that memorandum from Dr. Rosenstein to Nutter describes two methods for the production of what appeared from the correspondence was sodium ethyl xanthate. Perhaps we had better run over it.

40 "The samples of sodium xanthates labelled 'A' and 'B' were prepared as follows: Sample 'A' was separated from the alcoholic solution by refrigeration, filtered off, and then fused at a temperature just slightly above its melting point, and kept at that temperature until freed from its alcohol. It was then allowed to

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solidify and was subsequently pulverized. Sample 'B' was obtained by taking the residual alcoholic solution, filtered off from the crystals of sample 'A', putting it into a still and distilling"—

There is a mistake which is quite obviously a clerical error. The words between that word "distilling" and "alcohol" on the next line are simply a repetition by the stenographer.

HIS LORDSHIP: "Putting it into a still and distilling the alcohol."

MR. BIGGAR: You have really got to strike out the intervening
10 words which are just a repetition of the words that have gone before.

HIS LORDSHIP: It is all right in my copy. "Sample 'B' was obtained by taking the residual alcoholic solution, filtered off from the crystals of sample 'A', putting it into a still and distilling the alcohol until the solid residue had left in it only a small amount."

MR. BIGGAR: The words "crystals of sample 'A', putting it into a still and distilling the" are then repeated. Oh, perhaps it is our
20 mistake. It is a copying mistake. I thought it was an original mistake. Then we are all right.

"—putting it into a still and distilling the alcohol until the solid residue had left in it only a small amount. This solid residue was then carefully fused, poured out of the still and put into a hot closet, where it was kept just above its melting point until the last trace of alcohol was gone.

If the observations are correct that sample 'B' did not work the same as sample 'A', it would mean that in the distillation of the
30 alcohol at ordinary pressure the temperature that is reached as the solution concentrates is sufficient to cause decomposition of the sodium xanthate, and this may be due to a combination of an increase in temperature, together with a small amount of water which is necessarily present as the result of the reaction. To prevent decomposition, it may be necessary",

and so on and so on, which does not matter. Then your Lordship will observe at the end it says, "further samples will be submitted."
40 So that we have got now two different alternative ways of making it by a commercial manufacturer, and both of them are, as I said, different from paragraph 8. Now we come to the middle of June.

HIS LORDSHIP: Two different ways of making—

MR. BIGGAR: Two different ways of making sodium ethyl xanthate, each of them quite different from the process of making potassium ethyl xanthate in paragraph 8.

HIS LORDSHIP: This might be a convenient place at which to adjourn.

Court adjourned at 1 o'clock p.m., to resume at 2.30 o'clock p.m.

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AFTERNOON SESSION

2.30 P.M.

MR. BIGGAR: My Lord, as I think I was saying, the next time that we deal with is the middle of June when the first tests were made at Anaconda.

HIS LORDSHIP: That would be 1923?

MR. BIGGAR: This is all 1923 before the original application for a patent.

HIS LORDSHIP: This was at Anaconda.

10 MR. BIGGAR: At Anaconda where they went to make some tests, and there were two xanthates used. The description of them is in a letter of May 29th, 1923, which is production 216. It has been marked as an exhibit. It is one of the ones which have been given to your Lordship in a little collection. It is part of exhibit—

HIS LORDSHIP: They all have separate numbers.

THE REGISTRAR: D-64.

MR. BIGGAR: It is a letter of May 29th, 1923 from Nutter, the chief engineer, to Minerals Separation North American Corporation, the plaintiff. Your Lordship will see that he begins by saying:

20 “In accordance with my telegram of the 25th, I am arranging for Lewis, Littleford and myself to go to Anaconda to conduct tests there with the xanthates. Lewis left this morning with a sample of the xanthate we have been using in the laboratory, and also a new sample from the Great Western Electro-Chemical Company of material such as they are making to fill our order for 250 pounds of potassium and sodium xanthate.”

It then goes on to say that they made both potassium and sodium, but that does not matter. The point is they started out there with those tests with two different things. It is impossible to make out
30 from the productions exactly what either of these was, but it is pretty clear that they were neither of them xanthates prepared in accordance with paragraph 8. The only thing we can rely upon with regard—

HIS LORDSHIP: Neither were prepared in accordance with paragraph 8.

MR. BIGGAR: Paragraph 8 of the patent.

HIS LORDSHIP: But this date is anterior.

MR. BIGGAR: All of them are long anterior; I am not referring to any dates. I will tell your Lordship when we come to the date when the patent application intervenes. Your Lordship will remember
40 they had begun using in the laboratory before this some chemically pure xanthate.

HIS LORDSHIP: Yes.

MR. BIGGAR: And also some other samples, but I am pointing out that we cannot say exactly how this xanthate that we have been

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using in the laboratory was prepared though on that point it is worth while looking at a letter of July 25, which is exhibit K-30. I am going to refer to the end of the last paragraph in that letter.

HIS LORDSHIP: K-30.

MR. BIGGAR: Yes, my Lord, July 25th.

HIS LORDSHIP: That is from Keller to Nutter.

MR. BIGGAR: Yes, my Lord. You see he says:

10 “The method employed by me in the laboratory consisted in dissolving the alkali in an excess of alcohol and driving off and recovering this excess before precipitation with carbon disulphide,”

which is presumably what this has reference to, but I cannot say that it has because I am going back from July 25th to May 29th.

HIS LORDSHIP: “In both these methods the yield should be almost theoretical.”

MR. BIGGAR: But the point really is not the result but the fact this was quite different from paragraph 8.

HIS LORDSHIP: Different from paragraph 8.

20 MR. BIGGAR: It is quite different from paragraph 8 because the excess alcohol is driven off before the carbon disulphide is added whereas in paragraph 8 it is not. In paragraph 8 they added the carbon disulphide to the mixture.

HIS LORDSHIP: Before centrifuging?

MR. BIGGAR: Well, before centrifuging, right at the beginning really in the first two lines of paragraph 8.

HIS LORDSHIP: Yes, a theoretical amount of carbon disulphide is added while it is being stirred and while in the cooling bath.

MR. BIGGAR: And before there is any withdrawal of alcohol whereas here the excess alcohol has been driven off.

30 HIS LORDSHIP: Before carbon disulphide is added.

MR. BIGGAR: Before carbon disulphide is added, yes, so that it is different.

HIS LORDSHIP: It is different.

MR. BIGGAR: The new sample from the Great Western Chemical Company is, of course, one, no doubt, of the further samples referred to in the letter of May 10th but we do not know anything about that. Your Lordship will find that these tests that were made with these two samples were encouraging but they were inconclusive.

HIS LORDSHIP: Which two samples are those again?

40 MR. BIGGAR: These are the two samples in the letter of May 29th, my Lord. In the letter of May 29th you remember there were two samples they went with, one a sample of what they were using in the laboratory, and the other—

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HIS LORDSHIP: The other prepared by the Great Western Electro-Chemical Company.

MR. BIGGAR: Yes, and it is not without importance that this sample prepared by the Great Western was in the way they were using to prepare an order of 250 pounds. We do not know when that order was given. These tests that were made with these two samples were said to be encouraging but inconclusive. I do not need to read the correspondance that indicates that but your Lordship will find it in three things, a telegram of June 15th, exhibit K-5, a
10 letter of June 18th, which is production No. 263 and is now exhibit No.—

HIS LORDSHIP: What production did you say it was?

MR. BIGGAR: It is 263, my Lord.

HIS LORDSHIP: It is exhibit D-65.

MR. BIGGAR: And a third letter which is production 219, and is dated June 26th.

HIS LORDSHIP: What production number did you say?

MR. BIGGAR: 219, my Lord, dated June 26th.

HIS LORDSHIP: I think that is exhibit D-68.

MR. BIGGAR: D-68. There is one passage in that letter that
20 I might call to your Lordship's attention. It is in the last sentence of the third paragraph.

"However, there is apparently considerable to be learned in regard to the use of these re-agents, and also the full economic effects of their use in various combinations are not clear to us."

That is from Roberts. It is not from the inventors.

HIS LORDSHIP: That is from the company to their chief engineer.

MR. BIGGAR: From the company to their chief engineer.

The next time we have the thing developing is in late July when
30 they were making further tests at Anaconda using xanthates that had been prepared by the Great West Company on a thousand pound order. In that connection I am going to call your Lordship's attention to Keller's examination, questions 562 to 568, page 180. I do not know whether your Lordship has it.

HIS LORDSHIP: I have not it immediately in front of me.

MR. BIGGAR: At all events, I can read it, your Lordship. It is in direct examination. It begins:

"Q. 562.—In July, 1923, Mr Keller, it was arranged by
40 Mr. Nutter that some large scale tests of xanthate should be carried on in the Anaconda Mill, and for that purpose Mr. Nutter made arrangements with the Grest Western Chemical Company to supply 1000 pounds of potassium xanthate to Anaconda. Do you remember that? A.—I recall that very well.

Q. 564.—That, as I said, was in the beginning of July, 1923?

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A.—I do not recall the date, but I remember the quantity.” Then there is some “back and forward” with Mr. Smart and Mr. Cohen that is irrelevant. Then:

“Q. 565.—In connection with that manufacturer did you make certain studies with respect to the preparation and manufacture of the material—A.—I did.

Q. 566.—Just a minute. With respect to the best methods of shipping it, and with respect to methods of analyzing the substances produced for its xanthate content? A.—I did.
10 Pardon me. There is one question I wanted to ask.”

Then there is an unreported discussion. Then Mr. Cohen goes on and asks that the last question and answer be read; and after that Keller says:

“A.—I do not recall whether I carried on or made analyses for the xanthate content. I don’t recall that now.

Q. 567.—Do you recall the others? A.—Yes, I recall the others, but it was rather regarding the suitability of the material than its xanthate contents.

“Q. 568.—Did you have some discussion with Mr. Nutter
20 and with Dr. Rosenstein, who was then the chief chemist of the Great Western Company, with respect to the best method of manufacturing xanthates? A.—Yes, some of them very acrimonious.”

HIS LORDSHIP: The best method of manufacture.

MR. BIGGAR: Yes, my Lord.

HIS LORDSHIP: I do not at the moment quite see the relevancy of that method of making the substance.

MR. BIGGAR: I think your Lordship will probably follow it better as I go on, because the methods were worked out and are
30 described, and I wanted to lead up to that. There had been two methods of manufacture devised by Rosenstein of the Great Western Chemical which turned out to be unsatisfactory, and they are described in a letter from Rosenstein to Nutter, or a memorandum of Rosenstein of July 21, which is Exhibit K-29. I do not think that needs to be read, my Lord, because those methods really do not matter. But I am dealing with them from the point of view of the discussion with Rosenstein that that leads up to. As a matter of fact, these, as I say, were not satisfactory; the tests were disappointing and were therefore stopped about August 8th, as appears from
40 Keller’s examination, Questions 576 to 582, which begins on the page following that which I was referring to before.

“Q. 576.—Mr. Lewis was at that moment in Anaconda working on that shipment of xanthate, was he not? A.—Working with that shipment of xanthate, yes.

Q. 577.—Did he report the result of his work? A.—He did.

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Q. 578.—What was the essence of his report? A.—That the material was not as good as the material prepared in the laboratory, and he asked for an investigation regarding the manufacture of that 1000 pound lot.

Q. 579.—Well, hadn't you already made that investigation as a result of your controversy with Dr. Rosenstein? A.—No. The investigation was made when Mr. Lewis found that the material was not up to grade, as far as I can recall now. I cannot remember the date exactly.

10 Q.—580.—I show you a copy of a telegram sent by Mr. Nutter to Mr. Lewis on August 3, 1923, and ask you whether you saw that telegram when it was sent? A.—Yes. I was—I asked Mr. Nutter to send this telegram.”

And Mr. Cohen put it in. Then it goes on:

“Q. 581.—Now, as a result of that communication the work was stopped up at Anaconda, was it not? A.—Yes.

Q. 582.—And arrangements were made for the preparation of a new thousand-pound batch according to the method insisted upon by you? A.—It was.”

20 Now we might, I think, usefully go back, my Lord, to the letter of July 25, where the first suggestion is made of the method proposed by Nutter. It is in the same paragraph as the one I referred your Lordship to before, and it is at the beginning of that paragraph. Mr. Keller says to Nutter:

“The method suggested by you in our conversation of this morning appears to have considerable merit.”

HIS LORDSHIP: That is in Exhibit K-30?

MR. BIGGAR: That is Exhibit K-30; yes, my Lord. Then he compares it with Rosenstein's. Perhaps I had better read the
30 comparison:

“As a matter of fact it combines the advantageous point of Rosenstein's dissolving of the alkali in water with the purity of the end product, as obtained by my method. If my memory serves me right it consisted in decanting the alcohol alkali solution to be used for the xanthate manufacture from the alkali water phase, this later to be evaporated for its alkali recovery which can be returned to the circuit.”

That gives the date of Nutter's suggestion, and the proposal itself is described in that letter of Nutter's of August 9, which is Exhibit
40 K-32. As you will see, this relates to a new lot of 500 pounds of potassium xanthate, as appears in the first paragraph. It actually was to replace 1,000 pounds that had gone wrong. As you will see, it says:

“Dissolve the proper amount of potassium hydroxide for the batch that is being made up in an excess of alcohol. The

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alcohol should be in sufficient excess so that the mixture will be liquid at the temperature resulting."

You will remember the other one was a pulp; it was a thick mass.

HIS LORDSHIP: Yes.

MR. BIGGAR: Continuing:

"This is then to be allowed to stand until the solid impurities and such of the water as is present and will do so have a chance to settle out. The supernatant liquid—"

That I suppose really means the liquid that is above the solids.

10 HIS LORDSHIP: Yes.

MR. BIGGAR: He says:

"The supernatant liquid, consisting of the alkali alcohol phase in then to be syphoned or ladeed off and mixed with the proper amount of carbon disulphide. The water phase following the mixture of potassium hydroxide with alcohol, which of course will consist almost entirely of a solution of the hydrate in water, should not be reused in making this particular shipment nor should the mother liquor resulting from centrifuged xanthate crystals, although it will consist mainly of alcohol.

20 The indications of the test work at Anaconda are that the purer the xanthate the better the results, so for this particular shipment we want to give them material of extra good quality, and I think that the same will result from the method indicated."

If your Lordship will turn the page, you will find that there is attached to that letter what may be called a flo-sheet. At the beginning you take the potassium hydrate and alcohol and mix them. Then you settle and decant the alcohol phase from the water phase, solid impurities, and so on. Then you put CS_2 into the decanted liquor, mix it with the liquid and centrifuge, discard the mother liquid and
30 ship the salt—an entirely different process.

HIS LORDSHIP: But he says likewise that the centrifuged material yielded better results than the results that are obtained by evaporation of the mother liquor.

MR. BIGGAR: Not only that, but better results than the original xanthate crystals with twenty per cent of moisture.

HIS LORDSHIP: Yes.

MR. BIGGAR: Then we go on to August, and tests with this 500 pounds produced very good results as appears from a letter from Nutter to the Company, which is production No. 236 and is dated
40 August 30th. I need not trouble your Lordship with the contents of that, but that is the effect of it.

Then the next thing that happened was that there was a competitor, and competitive tests were then arranged to take place in September. That appears from a letter from Nutter to Dr. Gregory dated Sept. 4, and it is production No. 238.

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HIS LORDSHIP: What is the date of that?

MR. BIGGAR: Sept. 3, 1923, my Lord.

HIS LORDSHIP: What production number did you say it was?

MR. BIGGAR: Production No. 238.

HIS LORDSHIP: It is Exhibit D-74.

MR. BIGGAR: You will see in the third paragraph of that letter. "This afternoon, Allen, Lewis and myself had a long interview with—"

Anaconda people, and some people of the Stearns-Roger Company.
10 Then:

"The upshot of the interview is that there will be two weeks more of testing as soon as we can get the necessary additional xanthate. These tests will be strictly competitive under rigidly parallel conditions."

For the purpose of those tests, my Lord, there were 1500 pounds of the material ordered from the Great Western Chemical Company; and in the telegram, which is a telegram of September 6, that is referred to. That is production No. 273. It is the last telegram of a series on that date, and I fancy your Lordship will find it marked as
20 an exhibit all by itself, because all the other telegrams are really irrelevant or supererogatory. It is a telegram from Nutter to the Great Western Electric Chemical Co. dated Sept. 6, 1923, my Lord.

HIS LORDSHIP: There are two on the same date.

MR. BIGGAR: One is from Nutter to the Great Western is it not? I mean there are two from Nutter to the Great Western.

HIS LORDSHIP: Yes.

MR. BIGGAR: It is probably the second of the two. The one that I am going to refer to is the one that begins:

"Mr. Henderson, I have assumed in my telegram—"

30 HIS LORDSHIP: That is right. I have it.

MR. BIGGAR: It is the last sentence to which I wish to refer, which is:

"As fifteen hundred pound lot is for critical competitive test, purity of this material from interfering substances is essential. Please show this telegram to Keller."

In other words, they were going to take the trouble to make an effective showing. They were concerned about the purity of the xanthate, and it was made by the Nutter method. The mother liquor was dumped down the sewer as appears from a letter from the Chemical
40 Company to the plaintiff Company under date of Sept. 15th; that is production No. 240. I need not read it, my Lord, because what the letter consists of is this. It is an Exhibit.

HIS LORDSHIP: I think it is Exhibit D-77; Sept. 15, 1923.

MR. BIGGAR: That is right.

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HIS LORDSHIP: From Henderson?

MR. BIGGAR: Signed by Henderson for the Great Western and addressed to the plaintiff.

HIS LORDSHIP: And headed, "Attention Mr. Keller."

The first part of it consists of a careful description of exactly how they were carrying out this Nutter method. And your Lordship will see that in the middle of the second paragraph the word "separated" is used instead of the word "decanted". The relative sentence is:

10 "The alcoholic layer is now carefully separated from the aqueous layer below and transferred to another vessel."

I need not trouble your Lordship with reading the description again, but the concluding paragraph is what I wanted to emphasize:

"The mother liquor produced in the process is not being recovered, but dumped down the sewer."

This is the mother liquor which the patent recommends the use of.

HIS LORDSHIP: Is that quite correct? The inventor says:

20 "Both the centrifuged crystals and the residue from the mother liquor gave excellent results in flotation. It was found in cases where sulphuric acid was used that the centrifuged material yielded better results than the uncentrifuged."

MR. BIGGAR: Exactly, just like Franc-Strohmenger. This is not the centrifuged material; this is material that was not produced in accordance with paragraph 8 at all. Instead of the carbon disulphide being added to the alkali in an alcoholic solution it was allowed to precipitate, and then the water phase, as they call it, was decanted, and it was only after the decanting that they added the carbon disulphide. And they got a purer content.

HIS LORDSHIP: But those are methods of getting the best xanthate.

30 MR. BIGGAR: That is what I am concerned with; it is the best method that they knew that they did not say.

HIS LORDSHIP: The method of getting the best substance.

MR. BIGGAR: That is quite right, my Lord. The way I put it is that they knew that better results could be got.

HIS LORDSHIP: But the invention is not concerned with the substance.

40 MR. BIGGAR: I am afraid I cannot concede that, my Lord. The invention in Franc-Strohmenger, for example, was the necktie; and what Franc-Strohmenger did not reveal was that the best material to use was so-and-so. He said, "Cut your material on the bias." He knew that there was one particular material that gave better results than any other. His invention was not the material. And here the invention is not the material. Here the invention is the results of getting a good flotation; and the inventor knew that you should use

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a substance prepared in a particular way for the purpose of getting good flotation results.

HIS LORDSHIP: You say that if there was a better way than the one he disclosed, and he knew of that better way, he must give that information.

MR. BIGGAR: He must give that information, so as to put people who have only his patent specification in the same position as he is to carry it out effectively.

There was one other refinement that was made in the production
10 of the material before the patent issued, which appears from a letter from Keller to Nutter, dated October 15, 1923. That is Exhibit K-39. In the second paragraph of that he said:

“I beg to state that the alcohol insoluble is due to formation of oxidation products by decomposition of the xanthate due to overheating in the dryer. This troublesome phase may be overcome in two days, by washing with carbon tetrachloride previous to drying or by dessicating in a vacuum dryer. As it will be some time before a vacuum dryer can be installed, resort will be had to the carbon tetrachloride wash. The oxidation
20 products formed lower the grade of the material but are apparently inert, metallurgically speaking.”

So that was simply a further refinement of the way that they worked.

That is all before the United States patent. Before the Canadian patent—it may be material to consider them from that point of view—there is further reference to the use of the mother liquor, in November, 1923, and dealt with in Keller’s examination, Q. 597 to Q. 601—Q. 597 and Q. 598 being the more important—and a letter of November 26, 1923, from Keller to Nutter, Exhibit K-40. Q. 597 and Q. 598 are on page 188 of Mr. Keller’s evidence:

30 “Q. 597.—Now, in the method which was followed at that time for the manufacture of xanthate, there was a by-product called ‘Mother Liquor,’ which was essentially an excess of alcohol used by the method, in which was contained in solution some xanthate? Is that so? A.—Yes.

Q. 598.—And did it become a commercial problem—did the disposition of that substance become a commercial problem? A.—It was, but that material did not consist only of excess alcohol containing some xanthate; it contained a fairly large amount of water, because the ordinary commercial alcohol, ethyl
40 alcohol of commerce, is around 89%; consequently a certain amount of water was present, which, if Great Western followed instructions, would have been eliminated by decanting the potassium hydroxide alcohol phase. If they did not do this, the mother liquor was apt to contain impurities.

Q. 599.—Did you make an analysis of that substance. A.—I did.

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Q. 600.—Did you make a report to Mr. Nutter concerning The word here is “containing,” but it should be “concerning”.

“its possible utilization? A.—I did.”

Then he produced a letter of November 26, 1923, which is Exhibit K-40. I need not read it all through. It describes a way in which for the purpose of making fresh xanthate—not for the purpose of using the mother liquor for flotation, but for the purpose of making fresh xanthate—this excess decanted material can be used, and not lost. It is a quite different method of dealing with the mother liquor
10 from that in paragraph 8 of the patent.

HIS LORDSHIP: Paragraph 8 is just evaporation.

MR. BIGGAR: Yes. This is an entirely different operation. I do not know whether it is necessary to go into details at the moment. The point is that it is different, and that it was developed between the applications for the United States and the Canadian patents.

There is only one other thing to which I want to refer on that point, and that is a letter of February 14, 1924, from Allen to Janney. It is production No. 277, Exhibit D-79. It is the third paragraph that is of interest:

20 “The Great Western Electro-Chemical Company is now supplying our licensees with crystalline potassium-xanthate of 97% purity, the superior quality of their product being due to improved manufacturing methods that we have devised.”

And so on.

I do not know whether my friend is going to suggest that he is entitled to the United States date, but if he is, that question will have to be discussed. I need not discuss it at this point, except to indicate what the nature of the difficulty is. Under the statute, in order to take advantage of a foreign patent's priority—that is, under section 8 of
30 the statute in question—the application in Canada had to be made within a year of the foreign application. What happened was that because of some office irregularity or postal irregularity or something of that kind they were not able to make any application on the 23rd of October, 1924, in the terms of the United States application, and they filed what I think is fairly to be called a fake application in Canada on the 23rd of October, 1924, which had none of the information that is given by the United States application, and in which the petition was not signed by the inventor. There was no inventor's
40 oath. The petition was signed by a patent attorney in Ottawa, evidently on telegraphic instructions from someone in Toronto, who apparently had telegraphic instructions from New York. And then subsequently—I cannot remember whether it was in November or December—papers were filed, an amendment. I am going to deal with that point later with regard to the question whether there was any authority in the Commissioner to issue this patent at all. The point is, when we come to it, that the fee was paid on what I am

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describing, perhaps unfairly, as the fake application, and no other fee was paid.

HIS LORDSHIP: I suppose that application was made to get it within the time limit.

MR. BIGGAR: Yes, my Lord. It was an attempt to get priority, which I am going to submit was unsuccessful, and which may have been made the patent irregular altogether. However, I had better go on with the other points about the specification.

HIS LORDSHIP: Are you still dealing with the question of necessary or useful information:

MR. BIGGAR: Yes, my Lord. This point comes within either sub-rule 3 or sub-rule 4.

The Court recessed for ten minutes.

HIS LORDSHIP: You are making the contention that the failure to disclose the best method of obtaining xanthate was a breach of the rule you referred to as sub-rule 3 as relating to failure to give necessary information, or that if it did not come under that sub-rule it would be a breach of sub-rule No. 4 as a failure to give useful information which the inventor had.

MR. BIGGAR: Quite so.

HIS LORDSHIP: That is the breach of duty that you charge to the inventor. Could it be said that these were tests made over a long period of time from the date when the potassium xanthate was made for laboratory purposes, as described in paragraph 8, and the date of the application in order to make sure that the improvement in the process was due to the presence of xanthate with some other mineral frothing agency and not due to something other than xanthate that was with a xanthate that was not a pure xanthate, and in order to make sure that the improvements so claimed were due to the presence of xanthate and not to the presence of xanthate plus something else?

MR. BIGGAR: No, my Lord, I do not think the correspondence will bear that interpretation.

HIS LORDSHIP: I understood Mr. Higgins to say that was one of the reasons for the long lapse of time between the first disclosure and the application and that therefore you would have to make sure by process of tests and the like whether it was due to the presence of xanthate.

MR. BIGGAR: There are two answers. The first is that is not what they were doing. They were developing the only method of manufacturing a xanthate which gave satisfactory results in an acid pulp. That was one, and the other was that the impurities which they were concerned to exclude were the very thio-carbonates which they were proposing to use under paragraph 7.

HIS LORDSHIP: Three of the claims concern themselves only with a non-acid pulp.

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MR. BIGGAR: That is perfectly true, but one of the claims sued on says an alkaline xanthate. That claim is objectionable on other grounds.

HIS LORDSHIP: You might succeed in washing out one claim with relation to the alkaline xanthate. The contention you have just been making might have the effect of destroying that claim.

MR. BIGGAR: I do not think so because the infringement is in an alkali circuit. It is a non-acid circuit.

HIS LORDSHIP: That the defendants use.

10 MR. BIGGAR: Non-acid, that is to say, an alkali circuit. They do not use an acid. This point I have been making has no relation to the defendants' use of the invention.

HIS LORDSHIP: No.

MR. BIGGAR: It is the public's.

HIS LORDSHIP: Just before recess you were about to make another point.

MR. BIGGAR: I was coming to another point.

HIS LORDSHIP: Had it relation to the same sub-rule?

20 MR. BIGGAR: Yes, sub-rules 3 and 4, either necessary or useful and known. It does not matter which. The point is this that they knew that these re-agents they were proposing were of no value with oxide ores.

HIS LORDSHIP: They were of no value with oxide ores?

MR. BIGGAR: Oxide ores as distinguished from sulphide ores which sulphide ores might be oxidized a little.

HIS LORDSHIP: What are oxide ores?

MR. BIGGAR: It is a different type of ore altogether from sulphide ore. I am not sure I can tell your Lordship the difference between them but they are two completely different types of ores.

30 HIS LORDSHIP: And the contention is made, as I recall it, that these xanthates show improvement with practically any kind of ore.

MR. BIGGAR: That is it. They do not distinguish.

HIS LORDSHIP: There is no distinction made in that contention between oxide ore and sulphide ore.

MR. BIGGAR: There is no distinction made anywhere. The only possible ground of distinction is in paragraph 6 where they say a suitable ore. You find out the ore, as you will see, when we come to claim 6. However, I am coming to claim 6 where it says a suitable ore.

HIS LORDSHIP: A suitable pulp of an ore.

40 MR. BIGGAR: Yes, a suitable pulp of an ore. There is no distinction made between ores at all and yet there are these two classes of ores as appears quite clearly from the evidence. I will refer you Lordship to it. It is in Keller's evidence. I will refer to question 41

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to 44—I will give your Lordship the pages afterwards—57 and 445 to 447. Page 113 is the first lot.

“Q. 41.—Now, in this entry, Mr. Keller”—

that is the entry on which he relates this conception of the 18th of September, 1923.

10 “Q. 41.—Now, in this entry, Mr. Keller, you have mentioned ‘sulphidizing agent.’ What did you mean by a sulphidizing agent? A.—A sulphidizing agent, to my mind, was an agent that covered oxide ores or oxidized mineral particles with a sulphide film.

Q. 42.—Why did you want to get a sulphide film on the mineral particles? A.—Because I know that sulphide film particles would attach themselves better to the oil-covered air bubble.

Q. 43.—And so float better? A.—And consequently float better, that is correct.

20 Q. 44.—You have said ‘oxide ores or oxidized mineral particles.’ Was a sulphidizing reagent necessary on both types of materials? A.—It is absolutely essential on materials which are thoroughly oxidized in larger quantities. On surface oxidized material, however, even smaller quantities of sulphidizing material seem to aid flotation.”

That makes a distinction between the two types of ores. Then, question 57 which is just two pages on, at page 115.

“Q. 57.—Consequently do I understand you to say that you sought for a sulphidizing agent—that one of the reasons why you sought for a sulphidizing agent was for the treatment of non-sulphide ores? A.—It started with that conception first.”

30 In other words, he was working a good deal with oxide ores. Then we come to questions 445 to 447 at page 165. He is asked:

“Q. 445.—Did xanthate appear to work on sulphide ores? A.—It did.

Q. 446.—Did it appear to work on oxide ores? A.—No, it did not work on oxide ores.

Q. 447.—What conclusion did you draw from those facts? A.—That the action of xanthate is different from the action of a sulphidizing agent.”

There is other evidence of the same kind, but it is simply confirmatory.

40 HIS LORDSHIP: That they knew that this reagent, Xanthate, did not work with oxide ore.

MR. BIGGAR: It did not work with oxide ore.

HIS LORDSHIP: And would that be non-disclosure of a necessary fact, or a useful fact?

MR. BIGGAR: Well, it was a very important fact. I think that the analogy is pretty close there to the analogy of the iron and the

Opening Remarks of Counsel

porcelain autoclaves. I think perhaps in that connection, my Lord, I might refer you—

HIS LORDSHIP: Are oxide ores acid ores?

MR. BIGGAR: No, my Lord; I am advised not.

HIS LORDSHIP: No. It has nothing to do with that.

MR. BIGGAR: The question of the acid circuit and the alkali circuit has nothing to do with it.

HIS LORDSHIP: It has nothing to do with it, whether the ores are acid ores or alkali ores. That is referable only to the pulp.

10 MR. BIGGAR: That is the expression we have been using with regard to the acidity or alkalinity of the pulp?

HIS LORDSHIP: Yes.

MR. BIGGAR: I might refer your lordship in that connection to Williamson in Exhibit 15; that will be W-15. It is also K-2. It is marked twice, and I was looking at the wrong note. It is marked in both examinations. It is Keller, Exhibit 2. It is a letter addressed to Nutter by Keller and Lewis on the 28th of March, 1923, and the relevant passage there is the one at the top of the second page. The letter is a very long one, as your Lordship sees, and taking
20 that paragraph that I refer to, the relevant part begins really at the beginning of the third sentence:

“It was also found that although a great excess of xanthogenate—”

That is the same thing as xanthate.

“—was used in treating oxydized copper ore. No sulphidizing action was obtained and consequently our testing was confined to complex ores and those sulphide ores that had proved refractory to ordinary methods of treatment by flotation where only a limited sulphidization was required to effect the desired
30 recovery.”

I do not think that my friends will contend, in view of the evidence, that those reagents—I do not like to call them xanthates, because they are not all xanthates, certainly—proposed will work with oxide ore.

Now, with your Lordship's permission I will turn to the claims.

HIS LORDSHIP: Before you do that, may I ask this. The other sub-rules that you speak of, sun-rules 5 and 6, relate to the claims.

MR. BIGGAR: They relate to the claims.

HIS LORDSHIP: They relate to the obligations in respect of the
40 claims.

MR. BIGGAR: Yes. With your Lordship's permission, I am going to take claim 9 first, because the most general objection to the claims apply to that claim. I am sorry, my Lord. I was leaving out something that I should have taken first, and perhaps you will allow me to go back to that before I come to claim 9.

Opening Remarks of Counsel

HIS LORDSHIP: Yes.

MR. BIGGAR: I want first to refer to the two first claims, one and two, that are not sued on. I made some notes on a copy of the chart which seems to have disappeared, my Lord I wanted to refer to the chart, Exhibit 57, but which has been mislaid. However, I can make the point that I want to make on it. It is very short. Even on Mr. Higgins' evidence—

HIS LORDSHIP: Chart 57, you say?

MR. BIGGAR: Yes. That is this chart.

HIS LORDSHIP: Is that the one on which he drew the circles?

10 MR. BIGGAR: Yes; the one with the circles and the marks. Even taking it on Mr. Higgins' evidence and apart from the evidence that will be given on the part of the defendant, there must be some hundreds of thousands of compounds that are within these claims. Without that one that I marked, I cannot give your Lordship exactly those; but Mr. Higgins agrees that for each of the compounds in line D there are thousands of possibilities, because there are thousands of organic radicals.

HIS LORDSHIP: I think he said "hundreds".

MR. BIGGAR: Did he say hundreds?

20 HIS LORDSHIP: I think so.

MR. BIGGAR: Well, at all events I think he agreed with me that there was a very large number.

HIS LORDSHIP: Yes.

MR. BIGGAR: It does not matter much what it was. He also agreed that there were of the order of fifty times as many compounds in each of the E's as there were in the D, from which it was derived. So that you get at the lowest, hundreds—and at the highest, very much more than hundreds—multiplied by fifty, in all those E's, except E.4, which was the only one, I think, that Mr. Higgins excluded
30 from being a sulphur derivative of carbonic acid that formed anions and cations in solution. I have not made the mathematical calculation but there would be—well, X is a very large number. Perhaps it is sufficient to say that. It is an attempt, therefore, even on Mr. Higgins' interpretation of that chart to include—and I think we can look at the whole specification in that light—a perfectly enormous number of compounds, in this monopoly. That number is very much decreased when we come to the claims that are limited to the xanthates, because we have only to concern ourselves with E.3.

HIS LORDSHIP: You are now speaking of claim 1?

40 MR. BIGGAR: No, my Lord. I say that claims 1 and 2 are very very wide, that they cover an enormous territory.

HIS LORDSHIP: They are enormous.

MR. BIGGAR: I say that territory is very much narrowed when we come to the claims that are sued upon, all of which are limited to the use of xanthates of some kind.

Opening Remarks of Counsel

HIS LORDSHIP: Yes.

MR. BIGGAR: But even there, they have included a perfectly enormous number of xanthates.

HIS LORDSHIP: In claim 9?

MR. BIGGAR: In all those claims—in claims 6, 7, 8 and 9, so far as they cover the xanthates. There are an enormous number of xanthates.

HIS LORDSHIP: In claim 7, for instance, it says "In the presence of a xanthate."

10 MR. BIGGAR: Of a xanthate. And if you have even hundreds in the formula D-12, you have fifty times as many hundreds, and therefore at the lowest, 5000, included in E.3.

HIS LORDSHIP: Yes.

MR. BIGGAR: So that the invention is by no means confined to anything that anybody knows will work; because, as Mr. Higgins agreed, he was not sure about the number of compounds that existed under D-12 and he did not know even about ammonium xanthate, which was one of the comparatively few xanthates that have been made. You will remember that he was doubtful about whether
20 ammonium xanthate was a possible compound.

HIS LORDSHIP: I think he was more than doubtful about it.

MR. BIGGAR: I thought that he was doubtful about it, because I called his attention to the fact.

HIS LORDSHIP: I think he said you could not make it.

MR. BIGGAR: Perhaps he did.

HIS LORDSHIP: I think he was positive about that.

MR. BIGGAR: Perhaps I had better refer your Lordship at this stage to the Exhibit with regard to the xanthates. It is Exhibit D-61.

30 HIS LORDSHIP: That is the same Exhibit?

MR. GOWLING: My Lord, that is the same point, as to whether that proves that ammonium xanthate can be made or whether it proves that somebody used the term.

MR. BIGGAR: All that it proves is that somebody reported that he had made it.

HIS LORDSHIP: Yes. And thus far, we have against that Mr. Higgins' statement, not that he did not think it could be made, but that it cannot be made.

40 MR. BIGGAR: That it could not be made. I am not referring to this for the purpose of ammonium xanthate. I am only on the point that in the publications that existed in 1923 there were a very large number of xanthates that had been reported to have been made; and even so, there are a very large number of xanthates of which there was no report, but which perhaps might be made. So that even the xanthate claims cover an enormous territory.

Opening Remarks of Counsel

HIS LORDSHIP: Yes. That is, with the exception of claim 8.

MR. BIGGAR: I mean, as far as they cover a xanthate.

HIS LORDSHIP: Yes; as far as they cover a xanthate. There are a good many xanthates.

MR. BIGGAR: There are a great many xanthates, of the order we will say, at the very least, of 5,000; and I think we shall give evidence to show that the order is rather of the order of hundreds of thousands than merely thousands. The point that I was on with regard to that, comparing claims 1 and 2 of these claims that are
 10 sued upon, is that claims 1 and 2 while they do not include all out-
 doors, they do include, say, a hemisphere, while the claims for a
 xanthate only include perhaps a county, but it is still a considerable
 area of territory.

Turning now to claim 9, which I have already read—

HIS LORDSHIP: There he speaks of the presence of a xanthate and a frothing agent.

MR. BIGGAR: Yes, my Lord, a xanthate and a frothing agent.

HIS LORDSHIP: I do not quite see the difference between claim
 9 and claim 7.

MR. BIGGAR: The difference is this, that claim 7 does not say
 20 anything about the use of a frothing agent. There was an attempt in
 claim 7 to cover the use of a xanthate without a frothing agent, but
 in claim 9 they have put in a frothing agent.

HIS LORDSHIP: Can you have a flotation operation without a
 frothing agent?

MR. BIGGAR: My information is that you cannot. As a matter
 of fact, that is one of the objections to claim 7.

HIS LORDSHIP: That is why I cannot quite understand the
 difference between claim 7 and claim 9.

MR. BIGGAR: That is the only difference. I do not think my
 30 friend will contest that when you have an element defined in one of
 two similar claims, and omitted from the other of that pair, you
 cannot read into the claim from which the element is omitted what
 is expressed in the other similar claim. That is the distinction that I
 make between 7 and 9.

HIS LORDSHIP: Would that be so when you read the claims in
 the knowledge of that time?

MR. BIGGAR: As a matter of fact, my Lord, I am not sure. In
 any event, if we infringe claim 9, we do not care very much about the
 40 other claims. Claim 9 has the frothing agent, and it is not very
 important to us how claims 7 and 8 are to be interpreted, because we
 only get out of one net into another. Claim 9 is the significant claim.
 That is the reason I was taking it first.

HIS LORDSHIP: You say it is the significant claim?

Opening Remarks of Counsel

MR. BIGGAR: I think it is the one that my friends can support most easily.

HIS LORDSHIP: More so than claim 8?

MR. BIGGAR: Yes, because they have no frothing agent in claim 8. Anyway, we do not infringe claim 8, for we have not used potassium ethyl xanthate.

HIS LORDSHIP: Would it be that a flotation operation of necessity means an operation where a frothing agent is used?

MR. BIGGAR: If necessary I can give your Lordship cases on
10 that point about reading into one of two similar claims an element that is omitted from one but is expressed in the other. The real practical point, though, is that if we infringe claim 9 we do not need to bother with either claim 7 or 8. There are different reasons about each of these, but they do not matter.

MR. GOWLING: I was under the impression that my friend had admitted using potassium ethyl xanthate, in the statement of particulars that was served after the statement of claim was filed.

MR. BIGGAR: I do not think so.

HIS LORDSHIP: I thought there was an admission of use of
20 potassium ethyl xanthate, in the memorandum filed in the course of Mr. Murdoch's examination for discovery.

MR. BIGGAR: As a matter of fact, potassium ethyl xanthate was used at one time, I think in 1929 or 1930, but it was only an experimental use for a couple of months, and it is not a matter of any real significance. My friend is wrong about the pleadings, but I do not think we need trouble about that so far as my opening is concerned, because the really significant claim is claim 9.

Now, there are two objections to claim 9.

HIS LORDSHIP: You are going to deal with objections to claim 9
30 in the light of sub-rules 5 and 6?

MR. BIGGAR: Yes, my Lord.

MR. GOWLING: My Lord, apparently the potassium ethyl xanthate was used more than six years ago, but in some manner it was mentioned in the particulars, and I do recall it. At that time, the years during which those agents were used were not mentioned, but it was cleared up later when my friends produced the table on the examination of Mr. Murdoch.

HIS LORDSHIP: That shows the years in which the various agents were used?

MR. GOWLING: Yes. And my friend's position was that they
40 did not use the potassium ethyl xanthate within the six years.

MR. BIGGAR: As a matter of fact, the pleadings really restrict it to five years, do they not?

MR. GOWLING: That may be.

Opening Remarks of Counsel

HIS LORDSHIP: At any rate, the memorandum shows exactly what was used by the defendant.

MR. GOWLING: Yes, my Lord. There is no quarrel about that.

MR. BIGGAR: The principal point with regard to claim 9 is that it covers the use of a xanthate with a mineral-frothing agent. That is any xanthate. We have evidence that certain xanthates will not work, and we are going to add to them when we give evidence.

HIS LORDSHIP: That certain xanthates will not work?

MR. BIGGAR: In other words, this falls within the mischief of
10 the sixth rule.

HIS LORDSHIP: That is, it includes or extends to something that is either old or useless?

MR. BIGGAR: Unworkable, yes, my Lord. The evidence that has already been given makes that clear, but we are going to add something to it.

HIS LORDSHIP: That is evidence of what general tenor?

MR. BIGGAR: The evidence is, first, that cellulose xanthate will not work, and that that was the only xanthate in commercial use in 1923.

20 HIS LORDSHIP: Has that already been referred to in the course of the trial?

MR. BIGGAR: I do not know that it has been mentioned, my Lord. I had better give your Lordship references to that. It was in Keller's contemplation, and he knew it would not work. The evidence was given by Keller, Q. 642 to Q. 646, at pages 196 and 197, and Q. 854 and Q. 856, page 231, and in the letter of July 27, 1923, Exhibit K-36. There is also the Wilkinson evidence, Q. 390 to Q. 392, at page 77. I had better read from Mr. Keller's evidence:

30 "XQ. 642.—I am not sure whether I stopped you in your answer. Were you going to give a reference to some other text books or literature that you consulted at that time? A.—Yes, there was one that I consulted in regard to the manufacture of cellulose xanthate, for rayon—the cellulose xanthate, which is used for the manufacture of rayon."

HIS LORDSHIP: There was a reference to that earlier in the trial somewhere.

MR. BIGGAR: I think there may have been, my Lord.

"XQ. 643.—That was a well-known xanthate in use for rayon at that time? A.—Yes, for rayon.

40 XQ. 644.—That was a Cross & Bevans book? A.—Oh, yes.

XQ. 645.—I think they were the first to show how that xanthate could be made. A.—Cellulose xanthate.

XQ. 646.—Yes, cellulose xanthate. A.—Yes."
Then I go to Q. 854, at page 231:

Opening Remarks of Counsel

“RDQ. 854.—You were asked about cellulose xanthate and reference was made to Cross & Bevans. Do you remember their discussion about such compounds? A.—Yes.

“RDQ. 855.—Was their discussion limited to that single variation of xanthate—cellulose xanthate? A.—I do not recall, but it gives a method of preparing cellulose xanthate.

RDQ. 856.—Was cellulose xanthate at the time known for its usefulness in anything else except the manufacture of rayon? A.—No, I am not aware of any other use but for that purpose.

10 RDQ. 858.—You knew it had been used in viticulture, didn't you? A.—I knew.”

Then the letter which shows that Keller knew about it is dated July 27, 1923, in which he deals at some length with cellulose xanthate. That is Exhibit K-36. The letter is addressed to Mr. Nutter. It says:

“Obviously the C_2H_5O radical in alkali xanthates can be replaced by certain carbohydrates such as Cellulose or Starch according to the equation—”

He gives the equation, and then goes on:

20 “A number of these alkali Cellulose Thiocarbonates or Alkali Cellulose Xanthates were made by me in March, 1923. All of these substances appear to be of a colloidal nature and on contact with metal salt solutions break up into Cellulose Hydrate, Alkali Hydrate and Carbon-disulphide. Free cellulose hydrate cannot be considered advantageous in the flotation circuit. Alkali Hydrate can be added in a less expensive and more effective form . . .”

Then in the middle of the next paragraph he refers to some tests which he made with Mr. Lewis:

30 “These tests, not being promising, were only recorded in Mr. Lewis' personal notebook, indicating that the ground had been covered.”

Then he says what the cellulose employed by him was. Finally he says, in the concluding paragraph:

“As it seems to me that an invasion of the Xanthate patent from the direction of the Thiocarbonates rather than from that of the Cellulose is to be apprehended, I beg to refer you to mine dated May 7th, 1923, re Thiocarbonates.”

40 That is no doubt where paragraph 7 came into the patent from. He discussed and discarded cellulose xanthate, and then was completely silent about it, and included it in this claim 9.

But that was not the only thing, because Wilkinson deals with the point too.

HIS LORDSHIP: Your contention would be that that alone would—

MR. BIGGAR:—vitate that claim. That is the way I deal with it.

Opening Remarks of Counsel

Now I will refer your Lordship to the evidence that was given by Mr. Wilkinson, the plaintiff's witness, at page 77 of the Commission evidence:

"XQ. 390.—And then there is a cellulose xanthate. You are familiar with that? A.—I am not familiar, but I am aware there is such a thing.

XQ. 391.—There is such a thing? A.—It is used of course in an entirely different character of work from the xanthates used in flotation. It is used in the preparation of rayon.

10 XQ. 392.—Yes. Would you expect it to be of any use in flotation? A.—I would not offhand. I have never tried it."

We are going to give evidence that it does not work.

There is on another point, the same kind of thing. That is to be found in Keller's evidence, at page 229. It is with regard to copper, cobalt and calcium xanthates. In Q. 843 he refers to a note, and then he goes on:

20 "XQ. 844.—Yes, as long as we get the effect of the note on the conversation, that is what I want. A.—Yes. 'Nutter gave me c.p.x.—' which stands for 'xanthate'—'telling me he wants tests at once. He suggested as coming from Rosenstein that copper xanthate, cobalt xanthate, calcium xanthate, etc., might be useful. Told him they were not as they are insoluble. Moreover they are covered by potash and soda in original report. He stated that Rosenstein had suggested it but when told that it did not work when tried he said, 'I thought it might be useful.'"

HIS LORDSHIP: So in addition to cellulose xanthate, you say there is evidence that copper xanthate, cobalt xanthate and calcium xanthate are also xanthates that do not work?

MR. BIGGAR: Exactly, my Lord.

30 HIS LORDSHIP: And that claim 9 contemplates any xanthate?

MR. BIGGAR: Any xanthate.

HIS LORDSHIP: And that it is bad, as covering something that is useless?

MR. BIGGAR: Something that is useless, according to the inventor's own admission.

Wilkinson goes a little far at question 383 to 394 at page 76. I have read two of them but to cover the others perhaps I can just state the effect of them. At question 383 he says that there are a large number of xanthates.

40 "XQ. 394.—Are they all equally active as flotation agents? A.—Not in my experience.

XQ. 385.—Perhaps you could tell me something of your experience which led to that conclusion."

Opening Remarks of Counsel

He says he tried different alcohols, and so on, and "we found ethyl xanthate about the best." That is the top of page 77—"and a few others."

"XQ. 386.—And what were the worst? A.—Well, it depends on what you call the worst. We could make with some difficulty a xanthate with one of the higher alcohols which might not work at all well in flotation."

Then he deals with sodium and potassium having been used successfully, and it is the second part of the answer to question 388 that is really the relevant point I am on. Dealing with sodium and potassium he adds:

"They are the only metals I know to have been incorporated in successful xanthate.

XQ. 389.—You wouldn't expect xanthates involving other metals to be successful? A.—If they can be made at all, they are very hard to make and have undesirable properties."

I say these people knew they really should have limited this to sodium and potassium xanthates. Yet they covered every oxide of the thousands of xanthates. There is one other point on claim 9 which I shall have to deal with tomorrow morning.

HIS LORDSHIP: We shall adjourn until 10.30 tomorrow morning.
—Court adjourned at 4.25 p.m. to meet Friday, November 17, at 10.30 a.m.

OTTAWA, NOVEMBER 17TH, 1944.
MORNING SESSION

ARGUMENT BY MR. BIGGAR, Resumed:

HIS LORDSHIP: All right, Mr. Biggar.

MR. BIGGAR: I was on the second point of Claim 9 which relates to the introduction of—

30 HIS LORDSHIP: You were just starting your second point.

MR. BIGGAR: That was it, my Lord.

HIS LORDSHIP: Your first point was that Claim 9 covers the use of a xanthate.

MR. BIGGAR: Any xanthate.

HIS LORDSHIP: Any xanthate.

MR. BIGGAR: Yes.

HIS LORDSHIP: With a mineral frothing agent, and that it is bad in that it violated the rule which you described as rule 6 on the ground that it included something that was useless.

40 MR. BIGGAR: Exactly, my Lord.

Opening Remarks of Counsel

HIS LORDSHIP: In the sense of being unworkable; and that the evidence discloses that there were certain xanthates—for example, cellulose xanthates, and copper, cobalt and calcium xanthates—which did not work.

MR. BIGGAR: Which did not work. And Wilkinson went even further.

HIS LORDSHIP: And Wilkinson went so far as to say that the only two xanthates that would work were potassium xanthate and sodium xanthate.

10 MR. BIGGAR: Potassium ethyl xanthate and sodium ethyl xanthate. Then the second point on that relates to the introduction of the words “non-acid,” and that is a rather different point which I am including here for convenience.

HIS LORDSHIP: The Claim is limited.

MR. BIGGAR: To non-acid circuits.

HIS LORDSHIP: To non-acid circuits?

MR. BIGGAR: Yes, non-acid pulp. The point with regard to that really relates to the definition of the invention as well as in the limitation of the Claim; because as your Lordship remembers, there
20 is not one single phrase in the disclosure which indicates that there is any difference between a non-acid and acid circuit.

HIS LORDSHIP: Except the statement—

MR. BIGGAR: Except with regard to the difference between the centrifuged and uncentrifuged material. I mean, as far as the use of xanthates is concerned, there is no indication that any xanthate as such works differently; although there is an indication that as between the centrifuged crystals and the evaporated mother liquor, the centrifuged crystals do work better in a non-acid circuit.

HIS LORDSHIP: And there is also the statement that ore pulps
30 may be acid, alkaline or neutral.

MR. BIGGAR: Yes, my Lord.

HIS LORDSHIP: Would it not be possible, in view of that general statement, to have one claim for all pulps, and then a narrower claim for acid pulps?

MR. BIGGAR: Quite so, my Lord.

HIS LORDSHIP: And then another claim for alkaline pulps and another claim for the neutral pulps?

MR. BIGGAR: Quite so, my Lord. There is no doubt about that. If there was anything in the disclosure to really support a distinction,
40 it would be perfectly proper to say in one claim, “I claim widely”, and in the other claim, “I claim more narrowly.” My point really is that there being nothing to distinguish the use of the xanthates as such in the different circuits, therefore the claim goes beyond the invention and really introduces a new mystery, as it were, into the interpretation of the specification as a whole.

Opening Remarks of Counsel

HIS LORDSHIP: I am not entirely clear as to what you mean, but you will no doubt explain it further.

MR. BIGGAR: I do not know whether I can carry it much further than that, my Lord. Apart from the two alternative laboratory products, there is no distinction at all in the disclosure between one kind of circuit and another. This covers any xanthate and covers it only in non-acid circuits. My submission is that that word was really put in because of what we described as the Lewis Invention; that is to say, the discovery that xanthates did work differently in
10 acid and alkaline circuits. And it incorporates, therefore, in this claim an invention that is or was, if made at all, made by Lewis and goes beyond Keller's invention, and reflects adversely on the description of the invention in the Keller specification and makes it not full and complete. This is as far as I can carry that, my Lord.

HIS LORDSHIP: That is, if there had been also a claim for its use in an acid pulp, you might not have been able to make that point?

MR. BIGGAR: If the word "non-acid" had been omitted, this point would have disappeared altogether.

HIS LORDSHIP: If you had had one claim relating to a non-acid
20 pulp, and another claim relating to an acid pulp, would the point also have disappeared?

MR. BIGGAR: I think it would have remained. I think it would still indicate that there was an inadequate disclosure, because there would be no distinction in the disclosure so far as the application of the invention as such to the two types of circuit was concerned.

HIS LORDSHIP: The description of the inventor is simply this: take the previous flotation process, where you get your froth resulting from a frothing agent, and then add xanthate. That is what the invention is.

30 MR. BIGGAR: Yes, my Lord.

HIS LORDSHIP: There is nothing more in the invention than that, the adding of a xanthate to any circuit. And then the inventor chooses to restrict his claim to its use in a non-acid circuit. Is there anything wrong with that?

MR. BIGGAR: No, I cannot say there is. It is one of those cases where, as Mr. Justice Rinfret said in the Gillette case, I think it was, that the claim was narrower than the invention. In giving the judgment of the court, Mr. Justice Rinfret said, "We are not concerned with interpreting this as if the inventor had been well advised and
40 bolder in making his claim wider than it should be." I cannot put it further than that. I only put this in relation to Lewis, that it is incorporating something that was part of the Lewis differentiation and is not adequately described. That is as far as I can go with regard to that. That is really all I have to add on that point.

I come then to claim 6, to which the comment or objection with regard to its breadth in covering any of a class of xanthates applies,

Opening Remarks of Counsel

if "alkaline" is given one meaning; but the new point of this claim, or the principal one of the new points, is the expression "alkaline xanthate". Your Lordship will remember that Mr. Higgins told us it should be read as "alkali metal xanthate," or "alkali xanthate," which he says is equivalent to alkali metal xanthate.

HIS LORDSHIP: Are there any xanthates made otherwise than with a metal?

MR. BIGGAR: No, my Lord, but there are some metals that are not alkali metals.

10 HIS LORDSHIP: But it is essential to the composition of a xanthate that there should be a metal?

MR. BIGGAR: Yes.

HIS LORDSHIP: It is a salt, and a salt is the result of the composition of acid and a metal.

MR. BIGGAR: Yes, my Lord. There is always a metal, as is indicated in that formula E-3 on Exhibit D-57. It is carbon with two attachments to sulphur, one to a radical and oxygen and the other to a metal and sulphur, always. But there are only some alkali metals. Of course, I should reserve the question of ammonium.

20 HIS LORDSHIP: Quite obviously that is a matter of controversy between the parties.

MR. BIGGAR: Quite so, my Lord, as to whether it goes to ammonium.

HIS LORDSHIP: Mr. Higgins says it does not.

MR. BIGGAR: We are submitting that the expression "alkaline xanthate" does not mean anything, that no intelligible meaning can be given to it; and it is really impossible, in our submission, for us to adopt by way of interpretation Mr. Higgins' suggestion, because your Lordship will find that the expression "salt of an alkali metal
30 xanthate" occurs in claim 5. So anybody reading the patent would certainly take the view that "alkaline xanthate" in claim 6 was something quite different from what the inventor had proposed to use or claimed the use of in claim 5.

HIS LORDSHIP: Why would not a person take it as just a short way of describing "alkali-metal salt of an ethyl sulphur derivative of carbonic acid"?

MR. BIGGAR: Because in itself it is unintelligible, my Lord.

HIS LORDSHIP: It has got to mean something.

MR. BIGGAR: It has got to mean something. But the point
40 really is that claims in a patent must be so clearly expressed that there is no doubt about them.

HIS LORDSHIP: Mr. Higgins said he did not have any doubt about it.

MR. BIGGAR: Your Lordship will hear the evidence for the defendant on that point.

Opening Remarks of Counsel

HIS LORDSHIP: Quite. Mr. Higgins said he took the term "alkaline xanthate" as meaning "alkali metal xanthate."

MR. BIGGAR: Your Lordship will remember that Mr. Higgins did say it was a slip.

HIS LORDSHIP: Yes.

MR. BIGGAR: It is another instance of the carelessness with which this specification was drawn and of its unsatisfactory and vague character throughout. Your Lordship will find that that claim was put in, in that form, verbally, when the patent was originally applied for in the United States, in October, 1923,, and it survived successive amendments in the United States without change. So if something else than "alkaline xanthate" had been intended, there were many opportunities to correct whatever slip had been made. It is suggested now that it must have been a slip, but if so it was a slip that escaped successive inspections of the patent. That is my submission to your Lordship on that point.

The other difficulties with that claim, my Lord, relates to the other general expressions. In the first place, it relates to any ore.

HIS LORDSHIP: Just allow me to read it so I will have it in my mind. This one differs from 7, 8 and 9 in the first place in that it claims an invention in a process.

MR. BIGGAR: It is a process claim, my Lord.

HIS LORDSHIP: Whereas 7, 8 and 9 are claims of improvement.

MR. BIGGAR: 7, 8 and 9 were all adopted at the suggestion of the examiner in the United States Patent Office. 6 was where the original application stopped. That was made originally and then they stopped, and then 7, 8 and 9 and all those twelve, I think it is, that I referred your Lordship to yesterday. I think perhaps that explains the introduction of non-acid, but that is pure conjecture. Your Lordship will see it is not limited to ores other than oxide ores. It is any ore.

HIS LORDSHIP: A suitable pulp of an ore.

MR. BIGGAR: Yes. Then you have got to choose your pulp. I think Mr. Higgins first said in chief that that related to the state of the ore.

HIS LORDSHIP: You mean "in agitating a suitable pulp;" you are directing attention to the words "suitable pulp".

MR. BIGGAR: Yes. He said first it related to the state of the pulp.

HIS LORDSHIP: That is the mesh of it.

MR. BIGGAR: How much it had been pulverized, how much it had been ground, how much water had been put into it, its physical consistency and matters of that kind. Then in re-examination he extended it to include a pulp of an appropriate ore.

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HIS LORDSHIP: Yes.

MR. BIGGAR: I may not be quoting him exactly but I am stating him accurately enough.

HIS LORDSHIP: You say that raises ambiguity?

MR. BIGGAR: Raises ambiguity.

HIS LORDSHIP: As to whether it is suitability from the point of view of fineness of its grinding or suitability from the point of view of the nature of the ore, whether it is oxide or sulphide.

MR. BIGGAR: Which is quite a different thing. As a matter
10 of fact, suitability from the point of view of its physical condition and the extent to which it is contained in water is perfectly fair. I have no quarrel with that at all because that was a part of the ordinary art of flotation.

HIS LORDSHIP: You had to have it suitably ground in the old art.

MR. BIGGAR: But when it is extended, as Mr. Higgins extended it, to the selection of an appropriate ore to treat then I say it is quite a different thing.

HIS LORDSHIP: You cross-examined Mr. Higgins again on certain matters that had been dealt with on the re-examination.

MR. BIGGAR: I do not remember whether I asked any question
20 about that, but I think not.

HIS LORDSHIP: You did ask him about a suitable ore in your cross-examination, did you not?

MR. BIGGAR: I asked him about suitable ore and he said—

HIS LORDSHIP: I mean a suitable pulp of an ore.

MR. BIGGAR: Quite.

HIS LORDSHIP: Was it on the cross-examination that he gave the answer to you that that meant a suitable ore?

MR. BIGGAR: No—you mean from the point of view of the char-
30 acter of the ore?

HIS LORDSHIP: Yes.

MR. BIGGAR: No, it was in re-examination. To me he said it depended on its physical condition, pulverization, and so on, which I say I could not quarrel with. Then on re-examination he extended it to the choice of the ore.

HIS LORDSHIP: You asked permission to cross-examine again in respect to certain matters but you did not ask him anything about that?

MR. BIGGAR: I do not remember having gone back on that at
40 all because he completed it. His evidence had been given about it. Your Lordship will see there is another choice—

HIS LORDSHIP: I should like to know at some time in the trial. I should like to have that seeming inconsistency in his statement cleared up.

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MR. BIGGAR: I do not think it is inconsistent. He added another qualification to suitability. The first qualifications he put to suitability in cross-examination were the extent to which it had been ground, the amount of water in it, and so on.

HIS LORDSHIP: Oh, I see.

MR. BIGGAR: Then it was an additional—

HIS LORDSHIP: So that you say that now his evidence is that suitable means suitable both from the point of view of its physical findings and also that it means suitable from the point of view of its—

10 MR. BIGGAR: Original condition.

HIS LORDSHIP: Chemical qualities such as being oxide or sulphide.

MR. BIGGAR: Oxide or sulphide, yes, my Lord.

HIS LORDSHIP: And that consequently it is an ambiguous term.

MR. BIGGAR: Consequently it is an ambiguous claim. You see there is another choice given in that which is perhaps less open to objection, that is, that the alkaline xanthate must be one adapted to cooperate with the mineral frothing agent.

20 HIS LORDSHIP: And it does not specify which kinds of xanthate are adapted and which kinds are not.

MR. BIGGAR: Exactly.

HIS LORDSHIP: You say that the term “adapted” is therefore also ambiguous?

MR. BIGGAR: Yes, my Lord. Now, we shall show that the alkali metals—I think Mr. Higgins in effect admitted it—include about five metals so that if alkali xanthate is to be read as the equivalent of alkali metal xanthates you have got a choice there of some half dozen xanthates irrespective of whether ammonium is to be included or not.

30 HIS LORDSHIP: Some of them may be adapted and some may not.

MR. BIGGAR: Some may be adapted to cooperate with some mineral frothing agents and some may not, but you are left with a whole lot of experimentation to do. I am leaving out the physical characteristics of the ore, pulverization. First you have got to find out whether the ore which you are proposing to deal with is an ore with which any xanthate will work at any time. Then you have got to find out that you choose an appropriate alkali xanthate, and if Mr. Wilkinson's evidence is to be accepted you must choose either potassium or sodium. Then you have got a choice as to the particular
40 radical that you are going to use. There you have got a choice among some hundreds if not thousands. Then, having arrived at that point you have got to choose a mineral frothing agent with which your particular xanthate will cooperate. In other words, you have got a wide field for experimentation under that claim to determine whether you can succeed at all, or whether you come within the claim, and

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you do not come within it unless you do succeed as a result of this experimentation. You have got no guide of any kind in the disclosure to direct you how to succeed.

HIS LORDSHIP: And the inventor must not leave the public to experimentation.

MR. BIGGAR: I think that is perfectly true, but it is particularly true that a claim must not be expressed so vaguely that it is only the successful experiments under it that are within the monopoly. That is really the point. I am going to go back for one instant to one of
10 the cases on that point, with your Lordship's permission. It is the *Natural Colour v. Bioschemes* or rather the Smith patent, as it was called in 31 R.P.C.

HIS LORDSHIP: That is in the Court of Appeal?

MR. BIGGAR: It is Lord Justice Buckley but as a matter of fact, my Lord, the judgment as given by Lord Justice Buckley was really approved by the judges above who added something to it. The passage that deals with these alternatives when you come to interpret a specification begins at the bottom of page 249, line 41. I read your Lordship a little bit of this but the whole passage is so interesting that
20 I think it is worth recalling it because there are three or four alternatives that he puts as to the possible way in which the specification is to be interpreted and the effect of each alternative interpretation. At line 41 it begins in this way—this is Lord Justice Buckley and he is speaking of the evidence of Professor Boys, who was an expert witness. He had had directed to him some questions with regard to the manner of the expressions in the patent.

“He said that he would have hesitated and then he would have tried, that is to say, ascertained by trial and error, what colour of screen would succeed. Assuming, however, as I think is the
30 fact, that the patentee has indicated tri-colour red and tri-colour green, the patent is, I think, invalid, because it does not achieve the result which the patentee says it will achieve. The matter may be summarized thus:—The patentee says his process will reproduce the natural colours, or approximately so. Blue is a colour. He says:—‘Drop the tri-colour blue, do not employ the blue end of the spectrum, blue, or approximately blue, will still be reproduced.’ It will not. The patent is consequently invalid.”

That is one interpretation. Then he goes on:

“But, further, if the patentee according to the true construction of the specification does not indicate the particular screens, tri-colour red and tri-colour green, but means that you may take red and any green that you like, then again the patent is invalid for it is proved that there are many reds and many greens which altogether fail. The fact is that the red and green which succeed best are to be ascertained by experiment, and, I think, by experi-
40

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ment which will vary according to the particular colours of the object which it is intended to reproduce.”

Then I read this.

“As a third alternative, the patentee may mean that the reader is to take any two which will ensure success. This, of course, is invalid for insufficiency. If the claim is for any red and any green that will answer the purpose, it is invalid for not distinguishing those that will answer the purpose. If it is a claim for all reds and all greens it is invalid because there are some which will not answer the purpose.”

10

So you have got four alternatives. They are beautifully stated in twenty lines by Lord Justice Buckley.

HIS LORDSHIP: This is really in respect of No. 5.

MR. BIGGAR: No, my Lord, I was addressing myself to No. 6. 5 is not sued on.

HIS LORDSHIP: Oh, the claim number—you were dealing with claim No. 6 but you were addressing yourself to your sub-rule No. 5.

MR. BIGGAR: Yes.

HIS LORDSHIP: On ambiguity in the specification. It is pretty hard to separate the two.

20

MR. BIGGAR: Very hard.

HIS LORDSHIP: If there is a claim for the use of all xanthates and some do not work it does not matter then whether he has indicated the ones that work and do not work, if he makes his claim for all of them.

MR. BIGGAR: That is the objection to claim 9.

HIS LORDSHIP: If he makes a claim for all of them and has indicated those that do not work it violates rule 6 because he claims something that is useless along with something that is valuable, and if he does not make this disclosure then it fails for ambiguity.

30

MR. BIGGAR: That is my point, that if the claim is so drawn that it must be so read in order to possibly support it as being a claim for the successful experiments then it is bad for ambiguity.

HIS LORDSHIP: Yes.

MR. BIGGAR: That covers what I have to say about the claims.

HIS LORDSHIP: You have dealt with claim 6 and you have dealt with claim 9. In your remarks in dealing with claim 9 you dealt inferentially with claim 7.

MR. BIGGAR: 7, my Lord.

40

HIS LORDSHIP: What do you say about claim 8?

MR. BIGGAR: Claim 8 is one that does not matter because we have not used potassium xanthate.

HIS LORDSHIP: You say claim 8 does not matter in this case?

MR. BIGGAR? In this case, no, my Lord.

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HIS LORDSHIP: Because the evidence shows the defendant has not used potassium xanthate.

MR. BIGGAR: Potassium ethyl xanthate within the period claimed which, according to the pleadings, is five years.

HIS LORDSHIP: So that in this particular case you are concerned only with a declaration as to the validity of claims 6, 7 and 9?

MR. BIGGAR: Yes, my Lord.

HIS LORDSHIP: Unless your contention with regard to the failure of the applicant to comply with the requirements of the law
10 relating to the disclosure part of the specification wipes out all claims.

MR. BIGGAR: Wipes out the patent as a whole. There is a point with regard to 7 which is not really material, that if it means anything different from claim 9 it means that you use no frothing agent, and the evidence is that it cannot work without a frothing agent.

HIS LORDSHIP: Does that not mean, therefore, that you must read the term, "flotation operation" as including a frothing agent?

MR. BIGGAR: I think not, my Lord.

HIS LORDSHIP: What would "flotation operation" mean then?

MR. BIGGAR: I mean he has been too grasping and he has got
20 something that would not work but, as a matter of fact, I do not think the point is of any practical significance because if we come under 9 then 7 does not matter. I do not think we need pursue 7.

HIS LORDSHIP: Because I cannot see what could possibly be meant by a flotation operation excluding a frothing agency.

MR. BIGGAR: As a matter of fact, as I say, it does not make any difference. If we are caught under 9, 7 does not make any difference to us one way or the other. Then, I go on to another question.

HIS LORDSHIP: You have finished—

MR. BIGGAR: I have finished with the specification as a whole.

30 HIS LORDSHIP: You have finished your opening with regard to the specification.

MR. BIGGAR: Now, my Lord, I am going to base what I have to say on this on a document which is marked exhibit G-3. It is exhibit No. 3 in the examination of Mr. Gregory.

HIS LORDSHIP: You have indicated you were making two other general submissions, one that there was no authority in the Commissioner to issue a patent at all. Are you now dealing with that one?

MR. BIGGAR: No, I am dealing with the anticipation point.

40 HIS LORDSHIP: That there was nothing in the specification that was not contained in a document which was published eight years before.

MR. BIGGAR: And that is this document, exhibit G-3.

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HIS LORDSHIP: You are now dealing with the defence of anticipation?

MR. BIGGAR: We call it that, yes, my Lord.

MR. GOWLING: That is the exhibit that is on its way.

MR. BIGGAR: I have a photostatic copy of it. May I hand it in in the meantime?

MR. GOWLING: We have one of the original copies. There were several copies of it.

HIS LORDSHIP: That is one of the documents that is on the way
10 from New York?

MR. GOWLING: Yes, my Lord; the copy which is on its way is identical with the copy which we have just handed your Lordship.

HIS LORDSHIP: You have a photostatic copy?

MR. BIGGAR: I have a typewritten copy of it which is perhaps a little easier to read, but it is page for page.

HIS LORDSHIP: That is dated August 15, 1915?

MR. BIGGAR: That is what I was going to call your Lordship's attention to first, that this document is dated on August 15, 1915, and is called on the title page, "bulletin No. 2."

20 HIS LORDSHIP: It is just called, "No. 2."

MR. BIGGAR: Yes, No. 2; it is referred to as bulletin No. 2 throughout the evidence. It is prepared at New York and is called, as your Lordship sees, "Preparation of Flotation Reagents."

HIS LORDSHIP: Mentioning a number of them.

MR. BIGGAR: Mentioning a number of them, yes. Perhaps we can deal with the contents of it first and the history of it afterwards. Page 1 deals with a preparation that is called Kotrix. That is irrelevant. That is true also of the next three preparations which are dealt with at page 5 and the following pages.

30 HIS LORDSHIP: Those are the preparations called minola—

MR. BIGGAR: Cinol, arenol, and that is also true of the preparation called grabanol, which is dealt with at page 8. We come to a preparation which is called stanol, the beginning of which is at the bottom of page 10. It begins, as your Lordship observes, like the other preparations with the preparation of it. Measure out so much denatured alcohol, so much carbon sulphides and so much caustic soda. "Shake until dissolved"—at the top of page 11—"and digest." That may be a mistake for "or digest", but it does not matter. It is more intelligible when you take it as "or digest."

40 "—in a reflux condenser until the caustic soda has disappeared. Several stanols have been made by varying the proportions of carbon disulphides and caustic soda to meet the condition of the ore under treatment."

I am at the top of page 11, my Lord.

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"The following proportions will serve as a guide."

Then there are seven separate formulae or recipes, A stanol and B stanol, and so on down to G stanol. The first five of them, A to E, contain nothing but denatured alcohol, carbon disulphide and caustic soda. The remaining two also include resin. The proportions of the three ingredients of the first five differ, they vary; and that is true also of the last two, F and G, which vary, and even with regard to the kind of resin. Then follows after G:

10 "Boil under reflux condenser until the resin is saponified. Dilute with 500 c.c. of water".

In my submission that sentence clearly is limited to the three preparations which alone have resin in them.

HIS LORDSHIP: They refer to resins.

MR. BIGGAR: Yes, my Lord. Then he goes on:

20 "These formulas illustrate that in preparing stanol variations can be practiced by the addition of resin, the alcohol can be diminished and the caustic soda should always be governed as to only have present sufficient quantity to produce the reaction sought for. With some ores an excess of caustic soda to neutralize the acidity seems to impart specific results over the neutral stanol."

Then in the next paragraph:

"The theory of forming flotation compounds from alcoholic caustic potash and the carbon disulphide may be expressed as follows . . ."

And he gives the formula. He then adds to that, as your Lordship will observe, "potassium ethyl xanthate."

HIS LORDSHIP: Is it the same formula?

30 MR. BIGGAR: Yes. Potassium ethyl xanthate, I think, is properly stated, although I have not read it very carefully. Yes, CS₂ means carbon disulphide, plus KOH, which is caustic potash.

HIS LORDSHIP: That is potassium, oxygen and hydrogen.

MR. BIGGAR: Yes. Then the alcohol that he proposes to use is C₂H₅OH which is ethyl alcohol. That is the formula for ethyl alcohol. Then I think it is "equals" that follows that, is it not? In my typewritten copy it is just a dash.—CS.

HIS LORDSHIP: It is just a dash here.

MR. BIGGAR: And then the CS divides itself into the alcohol attaching to an O.

40 HIS LORDSHIP: Yes.

MR. BIGGAR: And to the sulphide of potassium. Then you get some excess water he mentions. He adds "plus H₂O."

HIS LORDSHIP: Let me look at Exhibit P-54, I think it is. It is the chart.

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MR. BIGGAR: I looked at our photostatic copy, my Lord, to find out about this. I do not think it is of any significance, but the "2" is left off where the carbon disulphide is mentioned.

HIS LORDSHIP: I beg your pardon, Mr. Biggar.

MR. BIGGAR: The "2" is left off after the dash. It is CS₂, is it not? There should not be any 2.

HIS LORDSHIP: No. There is not any 2 on mine.

MR. BIGGAR: There is not any 2, and there should not be. I thought there should be and I made a note on my copy that perhaps the 2 was omitted. It should be omitted. But there we have it, that he proposes to use as a reagent potassium ethyl xanthate, and shows various mixtures of the three ingredients which result in its production. Then at the top of the next page:

"This equation illustrates that if we digest under a reflex condenser—"

The same group of things, carbon disulphide, caustic potash and denatured alcohol in the given proportions.

"—we should upon the completion of the reaction obtained—"

It is "obtained" but it ought to be "obtain."

20 "—obtain crystalline potassium xanthate which, however, is soluble in alcohol and can be employed at any strength to effect flotation of copper salts. Potassium xanthate is not a frothing agent and therefore it must be mixed with some appropriate agents that will give a voluminous froth. Alcohol, resin and pine oil seem to be the most suitable agents for this purpose. It might be conjectured that some arrangements of combining potassium xanthate with alcohol and resin, and then mixing this compound with mineral oil, would be the initial step of using such a commercial mixture for the flotation of copper carbonates."

30 That is another class of ores, my Lord, differing from oxide and sulphide. Then going on in the next paragraph:

"A substituted product may be formed by using caustic soda."

And it is the same three ingredients in a new set of proportions. I beg your pardon, my Lord, it is not the same ingredients. Now he goes to caustic soda instead of to the potash.

HIS LORDSHIP: Instead of potash?

MR. BIGGAR: Yes, my Lord. And the caustic soda formula or recipe is given. Then he goes on at the top of page 14:

40 "The soda compound does not seem to produce the correspondent good results as is produced with the potassium xanthate."

Which is misspelled in my copy, my Lord.

HIS LORDSHIP: It is "xanthate" here.

MR. BIGGAR: Yes, my Lord. He continues:

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“The high cost of potassium salt—”

Again misspelled.

“—will prevent this compound from entering as a competitor of the much cheaper sodium salt.”

These two statements seem to be a little contradictory to one another, that the potassium xanthate gives the best results, but the sodium xanthate is the cheaper and probably will be the more popular.”

HIS LORDSHIP: Would be the one that would be used.

MR. BIGGAR: Would be the one that would be used commercially.

10 Then he goes on:

“All the experiments conducted so far have been by the use of sodium hydrate and denatured alcohol”.

HIS LORDSHIP: So there were not any actual experiments with potassium xanthate?

MR. BIGGAR: Apparently not, my Lord. It was all with sodium. He says that all the experiments have been with sodium. Then your Lordship will see the last paragraph, and it is a very important paragraph:

20 “A very good compound is made up for alkali ores by using 20 per cent sodium ethyl xanthate and 80 per cent denatured alcohol.”

There is no such thing as an alkaline ore. It means an alkaline circuit.

HIS LORDSHIP: Yes. Apparently the scientist seems to be confused.

MR. BIGGAR: Quite. I mean, no doubt that would be an error.

HIS LORDSHIP: Or maybe it is just the patent solicitors.

MR. BIGGAR: There are no patent solicitors intervening here, my Lord. This is Martin himself. We cannot blame anybody else
30 but Martin.

HIS LORDSHIP: Who is the author of this?

MR. BIGGAR: This is Martin.

HIS LORDSHIP: It is Martin?

MR. BIGGAR: Martin himself.

HIS LORDSHIP: And no experiments were made with regard to potassium xanthate?

MR. BIGGAR: He says he has tried it only with sodium xanthate.

HIS LORDSHIP: Yes.

MR. BIGGAR: But he recommends potassium xanthate as well.
40 Of course, it does not really matter much, because the patent recognizes both. It does not specifically claim sodium, but one of the examples, as your Lordship will remember, was with the sodium xanthate.

HIS LORDSHIP: Yes.

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MR. BIGGAR: That bulletin, my Lord, was prepared by this man Martin after he came—

HIS LORDSHIP: It was prepared by whom?

MR. BIGGAR: By Martin, after he came into the employ of the plaintiff in March of 1915.

HIS LORDSHIP: Oh, I see. It was prepared by Martin after he came into the employ of the plaintiff.

MR. BIGGAR: He had been six months, or rather not quite that, but five months in the employ of the plaintiff. The agreements
10 under which he came to work for them are Exhibits W-2 and W-1. One of them is an employment agreement and the other is an agreement whereby the company was to get the benefit of all of Martin's inventions in consideration of paying him \$5,000; and they also agreed if any of his inventions were a success, to organize a company in which he should have a substantial interest and give him, I think it was, 25 per cent. I will refer to that, but I will also refer to one other provision in it, in Exhibit 1, my Lord, which is the agreement with regard to the \$5,000 and so on.

HIS LORDSHIP: Exhibit W-1?

MR. BIGGAR: Yes, my Lord; Exhibit W-1. These documents
20 are, I think, both dated on the same day, the 6th of March, 1915. The arrangement about giving the plaintiff Company the benefit of all of his inventions is subject to this—and it is in a curious place. It is not easy to find. It is at the end of the recitals. The last recital reads in this way:

“And whereas Martin has heretofore invented what he
believes to be valuable inventions and improvements in flotation
processes and reagents and is the sole owner of said inventions
and improvements and the right to patent the same, and all
30 rights therein and thereunder except a shop right to the Utah
Copper Co.”

He had come from the employ of the Utah Copper Company; and it appears that he had used at the Utah Copper Company—

MR. GOWLING: I am sorry, my Lord, to interrupt my learned friend; but unless he is prepared to prove what Mr. Martin did at the Utah Copper Company, I object to any statement about what he had done at the Utah Copper Company.

MR. BIGGAR: I am only referring to the evidence that was given
40 by one of the witnesses already examined, that he had used before a composition which at that time he called natrola and which, according to the evidence we have before us, is the same as stanol. That evidence is in. My friends have put it in. And that evidence is the explanation of the reservation in this agreement of a shop right. At least, I suggest that is the explanation of the reservation here of a shop right to the Utah Copper Company; and the rights of the plaintiff company are subject to that.

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The other provision with regard to the reward that Martin was to get is in the same exhibit. What it provides is that "the company will do their best to form a corporation for such manufacture"—that is, the manufacture of Martin's reagents—"or to arrange with a suitable corporation or group for the manufacture of the same and the Company will pay Martin twenty-five per cent of the net profits received therefrom."

What I submit about that, my Lord, is that when you take bulletin No. 2, it gives you really all the information of a useful
10 character that is contained in this specification.

HIS LORDSHIP: Perhaps we might recess now for ten minutes, Mr. Biggar.

MR. BIGGAR: Very well, my Lord.

—The Court took recess at 11.40 A.M.

—On resuming:

MR. BIGGAR: My Lord, I have looked up the evidence on the point with respect to which my friend intervened. Your Lordship will find the statement in Williams' evidence, at Q. 170 and Q. 171:

20 "XQ. 170.—Now the name "stanol" there was what I would call a fancy name adopted by Martin to identify that product; is that right? A.—Yes.

XQ. 171.—And that was the same product that was previously referred to as "natrola" when Martin was with Utah Copper Company? A.—Yes."

Now, my Lord, so far as I can see, the only answer my friend can make to the submission that all the information contained in this specification is also contained in Bulletin No. 2, is that Bulletin No. 2 is irrelevant and cannot be relied upon because of the provisions of section 61 of the present Patent Act. That section provides:

30 "61. (1) No patent or claim in a patent shall be declared invalid or void on the ground that, before the invention therein defined was made by the inventor by whom the patent was applied for it had already been known or used by some other inventor, unless it is established either that,
(a) before the date of the application for the patent such other inventor had disclosed or used the invention in such manner that it had become available to the public."

HIS LORDSHIP: So if this was made to the plaintiff—

40 MR. BIGGAR: That is what I am going to deal with, my Lord. There are to that two answers which I think I ought to state now in order that my friend will be prepared for them. One is that that section, which corresponds substantially though not verbally to 1932 Chap. 21, sec. 4, when a provision of that kind was first introduced into the Patent Act, does not apply to any patent which was

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issued before 1932. In other words, it is not retroactive. It is capable of being read, my Lord, as applying or as not applying. The question whether it applies or not turns upon—

HIS LORDSHIP: Its non-existence at the time the Court is asked to pass upon its validity.

MR. BIGGAR: Yes. The leading Canadian case upon the interpretation of a section as applying to existing rights—because here we have existing rights—

HIS LORDSHIP: And a presumption of validity.

10 MR. BIGGAR: Yes. The leading Canadian case is *Upper Canada College v. Smith*, 61 S.C.R., 413.

But leaving that for the time being, our submission is, secondly, that the condition here has been satisfied.

HIS LORDSHIP: The condition of disclosure to the public?

MR. BIGGAR: The condition of making available to the public, which I think is the same thing. Your Lordship's phrase is just as good as mine, but I am using the statutory phrase.

HIS LORDSHIP: How do you say that was satisfied.

20 MR. BIGGAR: There are two ways in which we say it was disclosed. The position, in our submission, is that there are only and can be only two forms of disclosure by an individual who invents, who goes through the process of making an invention. One is a disclosure in confidence to assistants, to advisers, to various people to whom a disclosure may often be made in confidence; and the other is a disclosure to somebody who is under no obligation of confidence. Now, we submit that when that bulletin was handed to Minerals Separation itself, Minerals Separation was under no obligation of confidence, and therefore there was a disclosure which made the contents of the bulletin available to the public.

30 HIS LORDSHIP: Even although the plaintiff was entitled to have the benefit of it?

MR. BIGGAR: Quite so, my Lord, the plaintiff was entitled to the benefit of it, but the inventor's right to rely on a confidential disclosure disappeared.

HIS LORDSHIP: Martin was an employee of the plaintiff?

40 MR. BIGGAR: I am coming to the distinction between the individual and the corporate body. My point at the moment is that while an individual inventor—and an invention can only be made by an individual—might disclose his invention confidentially so as not to affect his rights to obtain a patent on it, the moment that he discloses it to somebody who is under no obligation to him to treat it as confidential, it is a disclosure to the public.

HIS LORDSHIP: You mean, as between him and the company, he could not then on the basis of that get a patent?

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MR. BIGGAR: That is another question, my Lord, that I shall have to come to in a moment. Your Lordship will remember that actually there can be public use in Canada for two years without the inventor losing his right to a patent.

But the disclosure here was not limited to the plaintiff. At the same time, substantially, it is admitted that this bulletin went to Minerals Separation Limited, the English company.

HIS LORDSHIP: It went beyond the party who was entitled to have it under the contractual arrangement?

10 MR. BIGGAR: No, my Lord, I cannot put it too high there, because he was under an obligation to disclose to Minerals Separation Limited. The employment agreement was made with Minerals Separation Syndicate (1913) Limited, the plaintiff's predecessor; but the other agreement, the agreement to reveal inventions, and so on, from which I cited some passages, was made with Minerals Separation Limited.

HIS LORDSHIP: The English company?

MR. BIGGAR: Yes. But the point is that it was not his employer.

20 Then, thirdly, it is admitted that the invention, that is to say the use of any reagents covered by this patent, went into public use at Anaconda on the 19th of October, 1923, which was four days before the application for the United States patent.

And finally, it appears that it had been used commercially for those tests during the summer; that is to say, that it had been used in the mill during the summer for the concentration of ores in the ordinary mill operations to some extent. Now, that use both during the summer and, as admitted, from the 19th of October, 1923, onwards, can be said to be of Keller's invention, and that is the reason why I have got to go a little further with regard to that.

30 This is what I submit there. Minerals Separation Syndicate (1913) Limited and Minerals Separation Limited, the English company, whatever their contractual relation with Martin, must have the rights that are incident to one of two relations to an invention. They cannot blow hot and blow cold so far as their relations to the inventions are concerned. They must either take the position that their rights with regard to the suppression of an invention—which an inventor has, of course, for he need never tell anybody about it—are the same as those of the inventor; or they are forced, in my submission, to the position that they are, relatively to the inventor,
40 the public.

Now, if they are in the position of the inventor, then they are in the position of the inventor with respect to Martin, and they cannot say in 1923 that the invention which on this assumption they made—I mean, the invention with respect to which they have the rights was an invention made only in 1923, because they were already

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in the position of asserting inventor's rights with regard to Martin in 1915. I do not know whether your Lordship follows me?

HIS LORDSHIP: Yes, I do.

MR. BIGGAR: In other words, what I submit is that when that public use occurred in 1923, they could not say that was a public use of the later of two inventions in relation to both of whom they stood in the same position.

HIS LORDSHIP: Because they stood in the same position towards Keller as they stood in towards Martin?

10 MR. BIGGAR: Exactly, my Lord. And therefore they are on the horns of that dilemma. Either they made the public use in 1923, as exercising the rights of Martin which they acquired in 1915, or with relation to Martin and Keller they were in the position of the public and were under no confidential duty. And we submit that the invention of Martin was accordingly made available to the public when Martin's bulletin of 1915 reached them; or, alternatively, they were using Martin's invention and making it available to the public by their use in 1923. They cannot say that it was Keller's invention
20 on that point. They are on the horns of that dilemma, and whichever horn they sit on it pierces them.

HIS LORDSHIP: Have you propositions for that?

MR. BIGGAR: There is no authority of any kind at all, my Lord, but we can cite English cases, where the rule with regard to an application for patent is poles apart from ours. In the United States and Canada an inventor can go ahead and make use of his invention for two years in public without losing his right to apply, and get a patent. The English rule is exactly the opposite to that. It was developed very early, under the Statute of James, which, as your Lordship
30 remembers, makes an exception to the common law in that it allows the grant of a patent for a new manner of manufacture.

HIS LORDSHIP: Is that called the Statute of Monopoly?

MR. BIGGAR: Yes, my Lord. It is the Statute of James II. That is the statute that gives to the Executive the right to grant patents. It has been held more than once—I mean, there is no doubt about the rule—that if an inventor makes a disclosure to anybody who is not in a confidential relationship to him, before filing his application for patent, it is not new, and therefore the patent falls. But that is as near as you can get to any authority that is of
40 any assistance on the interpretation of section 61, because it has not been judicially discussed. The question of its application has been argued more than once in the Supreme Court. As a matter of fact it was the members of the Supreme Court who from the Bench, on the first occasion on which the section was discussed, raised the question of whether it was retroactive or not. In the particular

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cases where it has been discussed they have found it unnecessary to express an opinion one way or the other on its applicability.

HIS LORDSHIP: There have been cases in which it has been discussed?

MR. BIGGAR: Cases in which it has been discussed; but there has been no decision upon it.

HIS LORDSHIP: The discussion has been between counsel and the members of the Bench in the course of argument?

MR. BIGGAR: That is all, my Lord.

10 HIS LORDSHIP: There is no reference to it at all in the reports?

MR. BIGGAR: No, my Lord. So the Court has never had to determine the applicability of these English decisions to a disclosure to a person who was not in a confidential relationship to the inventor.

That is all I have to say about that, my Lord. I could give your Lordship the references to the distribution of Bulletin No. 2 and so on, but I think that can probably be done more conveniently later, if it is necessary.

HIS LORDSHIP: Is there any other document or application that you are relying on in respect of your defence of anticipation?

20 MR. BIGGAR: No; that is the only document, my Lord.

I leave that point to raise my third point against this patent, with regard to the lack of authority in the Commissioner. In connection with that, I should like to put in a certified copy of the Canadian file wrapper.

HIS LORDSHIP: Including what you called the dummy application?

MR. BIGGAR: I used a stronger word still.

HIS LORDSHIP: You called it a fake application.

MR. BIGGAR: A fake application, yes.

30 EXHIBIT D-83: Filed by Mr. Biggar { Certified copy of Canadian Patent
Office file wrapper of patent in
suit.

MR. BIGGAR: I do not know whether your Lordship has seen one of these file wrappers before.

HIS LORDSHIP: No, I have not.

MR. BIGGAR: They are much worse than the United States file wrapper, in that they are not chronological; and some of the papers do not appear to have any receiving date stamped upon them, so there is a good deal of conjecture about when the papers arrived.
40 But I think my friends Mr. Gowling and Mr. Robinson are agreed about the order in which the papers have got to be considered.

Your Lordship will observe that the outside document is an office document which contains some record of the various steps in the prosecution. It is no doubt for convenience. You see the appli-

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cation is No. 296,151 filed on October 23, 1924. The class is 75 and the sub-class 17. The title, on which something may turn, is "Froth Flotation Concentration of Ores." It is referred to division 3 on December 4, 1924. Nothing was done until then apparently. Then there were reports and amendments, and a stop order was entered and removed. I do not think that is material. That is under a special rule.

HIS LORDSHIP: Those are blanks.

MR. BIGGAR: Oh, I see; that is printed. I am reading from a
10 typewritten copy. There is nothing filled in. Notice of allowance on January 6, 1925, having been allowed on January 3rd, and J. Mitchell is the Examiner.

HIS LORDSHIP: There is a notation, "Publish Claim 4, 5, 6."

MR. BIGGAR: I thought perhaps that was printed too.

HIS LORDSHIP: What is inserted is, "4, 5, 6."

MR. BIGGAR: That means in the printed Patent Office record which is issued weekly there are never any but some of the claims that are printed. They do not print patents in full. All that they print is some of the diagrams and some of the claims.

20 HIS LORDSHIP: That would be after the grant?

MR. BIGGAR: Yes, and this indicates that there are the claims to be selected for publication, 4, 5, and 6. Now, my Lord, the next document to be referred to is one on the eighth page.

HIS LORDSHIP: The specification?

MR. BIGGAR: Oh, I beg your pardon, my Lord. I looked at this the other morning but I see my brief has been renumbered. It is the twenty-first page. It is a letter from Caron and Caron to the Commissioner of Patents.

30 "Find herewith Petition, Oath, and Specification of this application for a method for the Concentration of Ores, also the fee of \$15.

A new Specification, which may be amended to correspond with the case filed in the United States, will be substituted as soon as completed."

The affidavit required, my Lord, follows on the next sheet. Your Lordship will observe that is an affidavit purporting to be sworn by A. E. Caron, Albert E. Caron, who describes himself as the duly appointed attorney for Cornelius H. Keller, and says that he verily believes that he is the inventor which he really did not mean to say
40 at all.

HIS LORDSHIP: He says, "duly appointed attorney for Cornelius H. Keller I verily believe that he is the inventor"—

MR. BIGGAR:

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“of the new and useful improvements in a method for the concentration of ores described and claimed in the specification relating thereto, and for which I solicit a patent.”

Then he says:

“That no application for a patent for the said invention has been filed by him or others with my knowledge or consent in any foreign country except in the United States on October 23, 1923, under serial number 670,242.

10 And I further say that the several allegations contained in the said petition are respectively true and correct.”

The petition is three pages on, my Lord.

HIS LORDSHIP: That is on what page?

MR. BIGGAR: I believe it is page 25, my Lord. It is again signed by Caron. It is again dated on the 23rd of October, 1924, and it says that Keller has invented new and useful improvements in a method for the concentration of ores. The petitioner, Keller, says that he has invented new and useful improvements in a method for the concentra-
20 tion of ores, not known, and so on, in the ordinary form. He prays that a patent may issue and he appoints Caron for all the purposes of the Patent Act. That is the chap who is to be served with proceedings under another section. Then he appoints Caron and Caron to prosecute the application in the last paragraph. With that document there is a specification which immediately follows.

HIS LORDSHIP: Pages 26 and 27?

MR. BIGGAR: Pages 26 and 27. Page 26 is the formula part, but again the invention is described as, “a method for the concentration of ores.” Now we come to this specification, and I wonder if your Lordship will think my adjective is too strong. It may be you will.

30 “My invention relates to the concentration of ores by flotation, and more particularly to a method for which I have applied for a patent in the United States of America under serial number 670,242 on October 23, 1923.”

That is right, my Lord, the number is right.

“by which floatable minerals are separated from the materials with which they are associated.”

Here is a description of the invention and of its operation and use as contemplated by the inventor.

“The ore is concentrated by means of”—

40 And if your Lordship will allow me I will insert numbers to indicate the steps in this described process.

“The ore is concentrated by means of (1) the mixing the same into a body of water and (2) progressively raising it to the surface of the water and (3) mixing the emerging top layer by a film of aerated water, thus (4) floating the top layer into the main body of water at the surface.”

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If your Lordship will look at the claims while we are on it, again I will insert 1, 2 and 3.

“(1) a method of separation of floatable minerals from the material with which they are associated consisting of feeding the mixture into a body of water,

(2) progressively raising it through the surface of the water”—into super-ambient air, I suppose—

“(3) meeting the emerging layer by a down-flowing film of water substantially as described.”

10 The question really is—well, I had better go on with the exposition, my Lord. Your Lordship will find the next document by reference to page 10. No, I beg your Lordship’s pardon. It is at page 28. There is a receipt for \$15 enclosed in that letter dated October 23rd, and having at the head of it the serial number of the application.

HIS LORDSHIP: That is the next year?

MR. BIGGAR: This is all 1924.

HIS LORDSHIP: That is right.

MR. BIGGAR: You see the serial number of the application is at the top of that receipt. It is 247,576.

20 HIS LORDSHIP: That is acknowledged?

MR. BIGGAR: Yes, my Lord, but not until later, I think.

HIS LORDSHIP: October 28th.

MR. BIGGAR: Yes, my Lord, but there is something before that. At page 24 he goes through with a new petition.

HIS LORDSHIP: Oh, yes.

MR. BIGGAR:

30 “We enclose herewith a new petition signed by the inventor and oath as well as specification in duplicate and a third copy of the claims to be substituted for those filed yesterday. The associate power of attorney to us will be filed as soon as received as well as formal petition. We also enclose assignment from the inventor to the Minerals Separation North American Corporation, and fee of \$2.”

40 That document is one that appears at page 7 and following pages, my Lord. It is very hard to tell exactly which are included but certainly the specification that is at page 8 and the following pages is the specification which we have—I mean the specification in the patent. I think that probably the affidavit which is on page 7 which was dated on the 11th October, 1924, is probably the affidavit that was then filed on the 24th, but there is some doubt about that because you have got two other petitions by Keller, one at page 3 and the other at page 2. The one at page 3 is dated on the 11th October and may be the one that was included in that letter of the 24th, but it cannot be the one at page 2 since the one at page 2 was not signed

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by Keller until the 5th December, 1924. I don't know whether I need trouble your Lordship with more of the file, but I can indicate what happened. What followed was the filing of certain powers from Williams and Pritchard to J. Edward Maybee, and from J. Edward Maybee to Caron and Caron. Some of those may have been signed on the 24th. Then subsequently the Registrar called attention to the fact that he had no power of attorney from the inventor himself, and one was obtained along about the 5th of December. There was no other fee paid except for the assignment that was made to Minerals

10 Separation, a fee of \$2. In view of that my submission is that there was no compliance with the Statute at all with regard to the invention that had been applied for in the United States until at the earliest October 24th, that the October 23rd application applied to a different invention with a different title, that it was with respect to that invention that the fee was paid, the one of the 23rd. I am submitting just the outlines of it now, that it was with respect to that invention of the 23rd that the fee was paid and that the Commissioner was without power to make a grant on the second specification without a fresh fee under the statute.

20 The reason I am making those submissions is by reason of the statute. Nobody in Canada had on the 23rd October any knowledge of the serial number of the United States application, serial number 670,242. You see that patent had not been issued in the United States and nobody except the inventor and his attorneys had access to the papers in the United States Patent Office. So that so far as anybody except the inventor himself was concerned there was nobody in Canada, no public officer, no one who had any information about the contents of that United States application, serial No. 670,242, that was given in that specification of October 23, 1923. If

30 your Lordship will look at the statute I will refer to the appropriate relative part.

HIS LORDSHIP: I have it on my desk. I can get it.

MR. BIGGAR: You see section 7 is the section which authorizes the issuing of a patent to any person who has invented a useful art, etc., and that can only be done by the commissioner, a statutory officer, on compliance with the other requirements of this Act. Then, section 8 is the one that gives priority. As a matter of fact, it was thought for a long time that section 8 actually limited the time within which the patent could be issued. Perhaps I had better save that

40 point. It was decided in the sense that I am assuming by Mr. Justice Audette a good many years ago, that a late application did not prevent the inventor getting the patent at all. It affected only his priority, but your Lordship will no doubt regard yourself as bound by that decision. However, I ought to save that point in case it comes for review further on.

"Any inventor who elects to obtain a patent for his invention in a foreign country before obtaining a patent for the same

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invention in Canada, may obtain a patent in Canada if the patent is applied for within one year from the earliest date on which an application for a patent for the invention was filed in any foreign country."

HIS LORDSHIP: Yes.

MR. BIGGAR: The rest of this does not matter.

HIS LORDSHIP: What is the date of the next application?

MR. BIGGAR: The date of the next application was October 23, 1923, so that the year expired on October 23rd, 1924.

10 HIS LORDSHIP: Yes.

MR. BIGGAR: And that was the critical date, and was no doubt recognized by the people concerned at the time. But you see, it is the same invention, and it is his invention, both in that and the other.

HIS LORDSHIP: Yes.

MR. BIGGAR: Now if your Lordship looks at section 10—

HIS LORDSHIP: In the case of an invention, where application for the patent for the invention was filed in a foreign country, in such a case the Commissioner would have knowledge of the application number in the foreign country.

20 MR. BIGGAR: He would not even have that. There is nothing in the foreign application, so far as the United States is concerned, which is known to anybody but the people who are prosecuting the application.

HIS LORDSHIP: Yes.

MR. BIGGAR: Then section 10 is the one that requires the inventor to make oath. There is nothing really very significant in that, except in subsection 2, where there is provision for somebody else to make that oath only in the event of the inventor being dead or mentally or physically incapable or if, after the assignment of the
30 invention, the inventor refuses to make it. Here Mr. Caron made an affidavit when Mr. Keller was not either mentally or physically incapable, or by reason of any refusal. He made the document afterwards.

The next relevant section is 13, my Lord, which requires the applicant to insert a title or name of the invention, and, with the petition, to send in a specification in duplicate of the invention, and so on. I call attention to the first part of that partly because your Lordship will see that quite different titles are given in the application of October 23 and that of October 24, and that the acknowledgment
40 of the fees and so on gives the title as does the flyleaf on the file, in the way that it is given in the second application; that is to say, the application of October 24th. The enclosures do not, according to my reading of the file, appear to have been given until October 28th. At all events, I cannot find any before October 28th. On page 29 of the file, and the serial number is there again—

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HIS LORDSHIP: Just a minute. October 28th, did you say?

MR. BIGGAR: October 28th on page 29. The filing date is given as of the 23 October, but the title as given there is the title of the application of the 24th, not that of the 23rd.

HIS LORDSHIP: "Froth flotation concentration of ores."

MR. BIGGAR: Yes. And the other one was a method for the concentration of ores.

HIS LORDSHIP: The petition of the 23rd described it as "improvements in a method for the concentration of ores."

10 MR. BIGGAR: Yes. The title does not necessarily include the word "improvements". It is a method for the concentration of ores. That is regarded as the title; and your Lordship will see that those words are spelled with capitals in the specification on page 26.

HIS LORDSHIP: Yes; method for the concentration of ores.

MR. BIGGAR: Then section 14 your Lordship is perfectly familiar with, which is the section which defines what is the kind of specification. I do not think my friends will contend that on the 23rd of October a specification which complied with section 14 was sent in.

20 The next section is 43, my Lord, and that is the last of the sections to which I need refer you. No, I am wrong. There is one other. Your Lordship sees the beginning of it:

"The following fees shall be payable before an application for any of the purposes herein mentioned shall be received by the Commissioner, that is to say: On filing application for patent—\$15.00."

HIS LORDSHIP: The fee must be received by the Commissioner.

MR. BIGGAR: That is a statutory condition. If the two are to be regarded as the same, then that is all right. But there was no second fee paid.

30 HIS LORDSHIP: Maybe so. But I find it difficult to believe that a patent could be set aside because the fee was not paid with the application.

MR. BIGGAR: The ground upon which I put it is that the Commissioner of Patents is acting as a public officer, with restricted powers and jurisdiction; and if he goes outside those powers and that jurisdiction, what he does is void and has no effect. Therefore if he accepts and proceeds with an application without requiring the fee, he is going directly contrary to this section 14. That is the way I put it, my Lord. I mean, we are not determining the matter at this stage.

40 HIS LORDSHIP: I find it rather difficult to accept that.

MR. BIGGAR: I will have to refer your Lordship to one other section, really to lead on to some rules, Patent Office rules, that were in force at the time. It is section 59 of the statute which empowers the Commissioner to make rules subject to the approval of the Governor-in-Council, for certain purposes. That section is perhaps

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not very clearly expressed, but I refer your Lordship to the rules, because some of them are relevant. The first rule I think I had better refer to is 13. I can give your Lordship a set of the rules that were in force at the time.

HIS LORDSHIP: The rules that were in force at the time, did you say?

MR. BIGGAR: Yes.

HIS LORDSHIP: I should like to have a set which were in force at the time. I have the others.

10 MR. BIGGAR: I hand it to your Lordship. That is a set of the rules that were in force at the time. They are rather precious now, as your Lordship can imagine, so it would be worthwhile to take good care of it.

HIS LORDSHIP: They might be hard to get right now.

MR. BIGGAR: They are not easy to get nowadays; and as a matter of fact, they are rapidly going out of date, now.

HIS LORDSHIP: Oh, yes.

MR. BIGGAR: There are comparatively few outstanding patents to which they apply.

20 HIS LORDSHIP: There will not be many.

MR. BIGGAR: No, my Lord; there will not be many.

HIS LORDSHIP: I mean, these are rules effective on the 1st September, 1923.

MR. BIGGAR: Yes, and they continued in force, I think without change, until 1935; and even that is nine years ago. I beg your pardon. Until 1933, I am informed, so it is eleven years already since they have been changed.

HIS LORDSHIP: All right, Mr. Biggar.

MR. BIGGAR: The first rule, my Lord, is 13.

30 HIS LORDSHIP: I have it.

MR. BIGGAR: As you will see, that is the one that requires the applicant for a patent who desires to take advantage of priority, to file with his application a declaration giving particulars as to the date of the previous application in the country in which it was made." I refer to that because on the 23rd of October there was none.

HIS LORDSHIP: There was what?

40 MR. BIGGAR: There was no declaration with regard to the previous application, except what was contained in the specification, which was not a declaration as to the first application in a foreign country. It was simply an attempt to define the invention which, I suggest, was not an adequate attempt.

The next rule, my Lord, is 22, which says: "All business is to be transacted in writing and the action of the Patent Office is to be based exclusively on the written record." No attention will be paid

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to any alleged verbal promise or understanding in relation to which there is any disagreement or doubt.

HIS LORDSHIP: Where is there any applicability of that?

MR. BIGGAR: Only, my Lord, that we have got everything that is relevant when we have got the written document.

HIS LORDSHIP: Oh, yes.

MR. BIGGAR: And rule 25 may have some importance: "Applications for patents sent to the Patent Office unaccompanied by the fee, petition, oath and specification provided by law, will receive
10 no recognition nor be filed nor numbered; they will merely be pigeon-holed, and only marked filed the day on which the fee, petition, oath and specification shall have been received." That works two ways, my Lord, partly for me and partly against me. That rule, if it was observed, might lead me to the position that he improperly received the papers on the 23rd of October and that therefore the only application was the one of the 24th. But in my submission he did, notwithstanding the rule accept the papers on the 23rd, and gave them a serial number, and proceeded on the footing that that was the day upon which the application was made; and that it is in the curious
20 position that, by putting on his certificates of these patents and in the Patent Office records that this application was received by him, or the application for this patent was received by him, on the 23rd of October, he either disregarded the rule or he misled the public, one or the other.

HIS LORDSHIP: Does anything turn in this on the matter of priority?

MR. BIGGAR: Well, it may, my Lord. Your Lordship remembers that I referred your Lordship to two or three letters as indicating knowledge received by the inventor or possessed by the inventor between
30 the two applications. And it is quite obvious, I think, or at least, it is a fair inference, it seems to me, that all this fuss and feathers on the 23rd of October was for the purpose of saving the priority or saving the right to patent; because Mr. Justice Audette's judgment to which I referred, was subsequent to 1924, I am sure. Yes, it was. It would be about 1930. Russell and the Commissioner was the name of it.

The next rule, my Lord, to which I want to call attention is 27, which deals with the right—

HIS LORDSHIP: You mean, if he does not get his petition in by
40 the 23rd, that he might be in the position of having acquired additional knowledge which he had not disclosed?

MR. BIGGAR: Well, it does not matter, my Lord. If he had not priority under section 8, then any additional knowledge that he acquired—

HIS LORDSHIP: In between the dates of the two applications?

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MR. BIGGAR: —in between the dates of the two applications, and the continuous public use of the invention between those two dates might affect the Martin situation.

HIS LORDSHIP: Yes.

MR. BIGGAR: But I do not think it does, really, as far as Martin is concerned, because we had the admission that public use by Anaconda began on the 19th of October, 1923. So we have a sufficient public use for our purposes there, without relying on the subsequent publication.

10 Then your Lordship will find in rule 27 the provision about amendments, or a provision rather about amendments, an incomplete provision. The rules are not very satisfactory there. It is the first line and a half along that is relevant: "The applicant has the right to amend before or after the first rejection or action."

But if your Lordship looks at rule 30, you will see how that right of amendment is restricted. The specifications and drawings must be amended and revised when required to correct inaccuracies of description or unnecessary prolixity, and to secure correspondence between the claim, the specification and the drawings, but no change in the
20 drawing may be made except by written permission of the office.

HIS LORDSHIP: Yes. We will adjourn now until 2.30. —Court adjourned at 1.05 P.M. until 2.30 P.M.

 AFTERNOON SESSION

FRIDAY, NOVEMBER 17, 1944. 2.30 P.M

HIS LORDSHIP: You had just referred to Rule 30 of the Patent Office Rules, Mr. Biggar.

MR. BIGGAR: Yes.

HIS LORDSHIP: It says, "The specifications and drawings must be amended and revised when required, to correct inaccuracies
30 of description. . ." That is a wide phrase, "inaccuracies of description," but you say it has really got a narrow meaning?

MR. BIGGAR: Yes. It means that if by mistake a statement is made that is not accurate, you may correct it. That happens quite often.

I cannot say, my Lord, that any of these rules forbid, as the practice has always forbidden, putting new matter into the specification after it has been filed.

Your Lordship will observe that Rule 30 does not say that
40 amendments are confined to correction of inaccuracies of description or unnecessary prolixity. Amendments may also be made "to secure correspondence between the claim, the specification and the drawing." Lack of correspondence between these arises as a matter

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of fact at times. And it is to be observed that this rule is in form categorical: it says the specifications and drawings must be amended. But the practice of the Patent Office, as I am quite sure my learned friend will agree, and the only proper practice of the Patent Office, is to make sure that in the course of the prosecution of an application there is not inserted something that has been developed by the inventor subsequently.

10 HIS LORDSHIP: There must not be the insertion of a new invention.

MR. BIGGAR: That is the point, my Lord. That is really of very considerable importance, because the date by reference to which the priority of any patent starts, is the date of the application; and if you allowed the insertion of matter that was ascertained by the inventor subsequently, he would really be putting back the clock, as it were.

HIS LORDSHIP: The monopoly is retroactive in its effect to the date of the application, is it?

20 MR. BIGGAR: Under our system it is not, my Lord, but under the English system it is. When a patent issues in England, it bears the date of the application. As a matter of fact one of the greatest defects of our system, and equally of the United States system, is that the patentee has no rights until his patent actually issues. In one case that we had before the Supreme Court there was an interval of twelve years in the prosecution of the patent, which projected the period of the monopoly to a period twelve years later than it should have run.

30 HIS LORDSHIP: No infringement action could be brought in respect of anything done prior to the granting of the patent?

MR. BIGGAR: That is right, my Lord. The effect of our system is this. An invention which ought to have given a monopoly from, let us say, 1940 to 1957, might by reason of this practice give a monopoly from 1949 to 1966, which might be a very different thing.

HIS LORDSHIP: And that lends itself to abuse. An inventor might strive to keep his invention in the application stage as long as possible.

40 MR. BIGGAR: That has happened. As a matter of fact we know of one patent in the United States, where the same practice prevails, which was filed in 1883 and actually issued in 1915. That was a patent having to do with moving pictures, and it was sought then to dominate the art to which it related in 1915. However, this is something we cannot change. That makes all the more important the non-introduction of new matter in the course of the prosecution.

That is all I have to say on that. My point can be very shortly put. It is that the invention described in the specification of October 23, 1924, is not the same invention as is described in the application of the following day. Therefore the Commissioner was, having

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regard to section 43, not entitled to regard it as the same prosecution. That is the whole point.

HIS LORDSHIP: I suppose with regard to the specification of October 23, 1924, something may turn on the reference to the United States patent by the number and the date of its application?

MR. BIGGAR: Yes.

HIS LORDSHIP: And the reference to what it related to?

MR. BIGGAR: Yes. All I can say about it is that the Commissioner would have no information given by that, except the statement
10 that followed as to the nature of the invention. And that was misinformation, not accurate information. It is impossible, really, to make sense either of the disclosure or of the claim.

HIS LORDSHIP: They certainly are subject to criticism.

MR. BIGGAR: I think they are subject to criticism. I do not think my friends would have got very far if they had carried on with that specification.

Now, my Lord, I have finished. I have been unconscionably long in opening, but at all events your Lordship does now understand what our approach to this question is. I was somewhat handicapped
20 because my friend's opening did not indicate his attitude towards the defences that were set up in the Statement of Defence.

HIS LORDSHIP: And quite properly so.

MR. BIGGAR: It is a perfectly proper practice, and not an unusual practice.

HIS LORDSHIP: And I should think a sound practice.

MR. BIGGAR: As a matter of fact, my Lord, it has been found a sound practice for a plaintiff to make the Court as familiar with the nature of the issues as it is possible to do. But I am not criticizing.

HIS LORDSHIP: I do not think the plaintiff should anticipate
30 what attack is to be made.

MR. BIGGAR: There is no obligation to do so. What I am pointing out to your Lordship is that my friend has not indicated, for example, what his view of the scope of the invention is. He has not indicated what the disclosure suggests with regard to the nature of the invention or its operation and use. However, those are points upon which, with our present information, we submit that the disclosure is bad in that it does not fully and correctly describe the invention, that it does not fully describe the operation and use, because it contains both misleading statements and omissions of
40 either necessary information or useful information which the applicant had; and as to one of the two important claims it is too wide, and as to the other it is ambiguous. And we also say that Martin contains and had communicated to the plaintiff information equal to the information that is contained in this specification.

Now we proceed to call evidence, my Lord.

Opening Remarks of Counsel
For Defendant—Dr. Purves—Examination-in-Chief

MR. ROBINSON: First of all, my Lord, there are two United States patents which I should like to put in. The first is No. 835,120, dated November 6, 1906, issued to a number of inventors, the first of whom is Sulman.

EXHIBIT D-84: Filed by Mr. Robinson { U.S. Patent No. 835,120, dated November 6, 1906, to Sulman et al.

MR. ROBINSON: The second patent is United States Patent No. 962,678, dated June 28, 1910, issued to Sulman and a number of
10 others, including Arthur Howard Higgins.

EXHIBIT D-85: Filed by Mr. Robinson { U.S. Patent No. 962,678, dated June 28, 1910, to Sulman et al.

CLIFFORD B. PURVES. Sworn. Examined by MR. ROBINSON:

1. Q.—Dr. Purves, I understand that you are now Professor of Industrial and Cellulose Chemistry at McGill University?
A.—That is correct, yes.

2. Q.—And that you obtained your degree of B.Sc. and subsequently of Ph.D. from St. Andrew's University in Scotland?
A.—Yes.

20 3. Q.—Then after that, I understand, you did some research work at the U.S. Bureau of Standards? A.—Yes.

4. Q.—That was on what subject? A.—That was on the chemistry of carbohydrates.

5. Q.—After that you went to Marischal College in Aberdeen?
A.—Yes.

6. Q.—Where you did what sort of work? A.—That was biochemistry of carbohydrates.

7. Q.—And after that you were with the United States National Institute of Health, I understand? A.—Yes.

30 8. Q.—Again on carbohydrate research? A.—Yes.

9. Q.—And from 1936 until last year, when you came to McGill, you were Associate Professor of Organic Chemistry at the Massachusetts Institute of Technology? A.—Yes.

10. Q.—That is in Boston? A.—At Cambridge, Massachusetts.

11. Q.—And while you were there you did research work on cellulose and related substances, I understand? A.—Yes. My special field was cellulose chemistry, carbohydrate chemistry.

40 12. Q.—Dr. Purves, if you will look at the large chart, Exhibit D-57, you will see a note at the bottom that R equals any organic radical, with certain exceptions. Perhaps first of all it might be useful if you could give us a word or two about what an organic

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radical is. A.—My Lord, as a matter of experience in dealing with organic chemistry it has been found convenient to assume that certain groupings of atoms pass through many series of chemical changes without altering their relative position, and those groupings are called radicals.

HIS LORDSHIP: 13. Q.—It is the grouping that is called the radical? A.—The grouping is called the radical. It is not a complete molecule, but it goes like a building stone through many chemical reactions.

10 MR. ROBINSON: 14. Q.—You have a chart that perhaps would be useful to his Lordship in connection with your explanations? A.—I have a chart here. (Produces.)

EXHIBIT D-86: Filed by
 Mr. Robinson } Chart of organic radicals.

HIS LORDSHIP: 15. Q.—A radical is a grouping of atoms? A.—Yes. It forms part of organic molecules, in theory.

16. Q.—Perhaps I should not betray my ignorance, but what is the difference between organic and inorganic? A.—It originated in the idea that living matter elaborated its own class of compounds and that it would never be possible to pass from the dead inorganic world to the organic. That theory broke down, but the arbitrary division of chemistry into the two classes remains, and new organic chemistry is classified as the chemistry of compounds containing the element carbon. Some few carbon compounds which are known in nature—for example, chalk or calcium carbonate—are still very often left in the inorganic field. With those exceptions, organic chemistry may be defined as chemistry of the compounds of carbon.

20

MR. ROBINSON: 17. Q.—On that chart D-86 perhaps you could give us some explanation of Nos. 1 and 2? A.—Yes. My Lord, it has been found from experience that the carbon atom has got four bonds, or one might almost imagine them as a sort of hooks or attractive bonds in the atom. Each of these four bonds is exactly equivalent in its properties, and they can become attached to similar bonds on other carbon atoms or on other kinds of atoms. For a molecule to be stable and to have an existence, one necessary condition is that all the bonds of all the individual atoms should mutually satisfy each other. In Nos. 1 and 2, for example, carbon has four bonds, and the hydrogen atom has only one.

30

HIS LORDSHIP: 17. Q.—No. 1 has four hooks? A.—Yes.

40 18. Q.—And No. 2 has one? A.—It has only one. Those are inherent characteristics of the carbon and the hydrogen atoms. When carbon combines with hydrogen, the simplest molecule will be one carbon atom in union with four hydrogens.

19. Q.—Each one of the arms of the carbon attracting a hydrogen atom? A.—Yes.

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20. Q.—That would make it a cohesive whole? A.—Exactly, my Lord.

MR. ROBINSON: 21. Q.—That is shown on the chart, is it not, Dr. Purves? A.—Yes. That union is No. 3 on the chart.

HIS LORDSHIP: 22. Q.—That is methane? A.—Yes. It happens to be a dangerously explosive gas that is fire damp and it is responsible for the explosions in coal mines. That is just aside. I do not know whether the comment interests you.

MR. ROBINSON: 30. Q.—Going from No. 3 to No. 4, that is
10 from methane to the methyl radical what happens? A.—Then in that case we have removed one hydrogen from methane.

HIS LORDSHIP: 31. Q.—Can you do that? A.—In theory, yes.

32. Q.—Only in theory? A.—Yes. In theory one can be removed in the sense that—to give one example, if we submit methane to the action of chlorine gas, one hydrogen will be removed and one chlorine will replace it.

33. Q.—Oh, yes. The hook of carbon that formerly attracted the hydrogen atom will attract the chlorine atom? A.—Yes.

34. Q.—But you could not have the carbon with only three
20 arms satisfied, the other one unsatisfied, either by hydrogen or some other atom in its place? A.—To be stable, it has to have the four valencies satisfied.

35. Q.—Otherwise it disintegrates? A.—It disintegrates. The methyl radical in the last ten years has been isolated in a very transitory way, and its life period is, I think, about some hundredths or some thousandths of a second.

36. Q.—But it has been isolated? A.—Yes, it has.

Q.—But only in a transitory way? A.—Yes, in an extremely transitory state.

30 37. Q.—That is, it would take some time. Once you remove one of the hydrogen atoms, it would take some time for the balance of the composition to disintegrate? A.—Yes; the time being something like a thousandth of a second.

38. Q.—A very short time? A.—A very short time. But that has only been done with a very few of the simpler radicals. Their main value is to simplify the enormous number of chemical changes that we have where the hydrogen atom is replaced by a chlorine and a chlorine may be replaced by a molecule of the hydroxyl group, which is oxygen and hydrogen. There are great numbers of changes.
40 They can all be written down on paper by assuming these radicals, even where they themselves are unstable.

39. Q.—You get a tremendous number of possible compounds? A.—Yes, and systematize an enormous number of experimental observations.

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MR. ROBINSON: 40. Q.—How would you describe the methyl radical from the point of view of free bonds or valencies that it has? A.—The way that I would describe that radical is by saying that it is a mono-valent radical; and I would define mono-valent as a radical which has got only one bond per carbon atom which was free to unite with some other group. That would be mono-valent.

HIS LORDSHIP: 41. Q.—It would be applicable to the hydrogen atom do I understand you to say? A.—Yes, to the hydrogen atom. If you had an isolated hydrogen atom, it would be mono-valent.

10 MR. ROBINSON: 42. Q.—Whereas carbon would be what? A.—An isolated carbon atom—if such could ever exist which I do not think ever would—would be tetra-valent or have four valencies.

43. Q.—Going from No. 4, the methyl radical to No. 5, the methylene radical, what has happened? What is the distinction? A.—The distinction there is that we have two free valencies ready for combination with other groupings, and the grouping which we could attach might be two chlorine atoms and then the name of the compound would be methylene dichloride, whereas in the first case it would be methyl chloride. Chemical nomenclature is built up on
20 that principle.

44. Q.—It is built up on the basis of one radical forming part of the name and another radical forming another part? A.—Yes, whatever the other part is.

Q.—When you get to compounds that are more complicated and have more than one carbon atom, what is the position as to possible free valencies? A.—On the chart we have ethane, which is No. 6. That is a hydro-carbon substance which happens to be a gas, which occurs in oil wells and so forth.

HIS LORDSHIP: 45. Q.—And there apparently one of the carbon
30 atoms has attracted three hydrogen atoms? A.—Yes.

46. Q.—And one carbon atom? A.—Yes.

47. Q.—And that carbon atom has attracted three other hydrogen atoms? A.—Yes. And if we look over those valencies, one of the rules for stability is satisfied in that each hydrogen atom is attached by its one bond, and the carbon atoms have each got their four bonds occupied.

48. Q.—The carbon atom can extend one of its arms to another carbon atom? A.—Yes.

49. Q.—It does not necessarily have to be satisfied by an atom
40 other than carbon? A.—No. In fact, that property that carbon has of uniting with itself is a property which it possesses in a degree far superior to that of any other element; and the organic world is really based on that remarkable affinity of carbon atoms for each other, to unite in almost endless strings and in various ways.

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MR. ROBINSON: 50. Q.—When you get to the radicals from ethane, what is the position, taking first No. 7 on the chart?
A.—When we are considering radicals derived from ethane, there is no ambiguity as long as we consider the non ethylene radical, because all these six hydrogen atoms are equally related to the carbon atoms.

HIS LORDSHIP: 51. Q.—Then could that group stand by itself?
A.—The ethane?

52. Q.—No, the ethylene radical; with the two hydrogen atoms removed? A.—No, I do not think so, my Lord. I mentioned the
10 removal of one hydrogen from each carbon atom, and that would give the radical which is known as ethylene, No. 7.

53. Q.—Yes. My question was directed to that. A.—Oh, was it?

54. Q.—Whether that could stand by itself. A.—No. I do not think it could, no. It has a radical name, and one would have to combine the two valencies with something else to make a compound with anything more than the most transient existence; transient meaning something in thousandths of a second or hundredths of a second.

MR. ROBINSON: 55. Q.—Now, Dr. Purves—yes, go on, doctor,
20 if you had not finished. A.—I was going to comment that, in a way, that ethylene radical might be regarded as composed of two methyl radicals.

HIS LORDSHIP: 56. Q.—Composed of which? A.—Two methyl radicals, No. 4, put back to back, with the carbons simply joining and removing the hydrogens.

57. Q.—That is the same thing? A.—Yes. And the chemical behaviour of radicals of this ethylene type bears out that view in the sense that the two free radicals, one in each carbon, really behave almost independently of each other. They will both behave as the
30 radical in methyl does. The other possibility, my Lord, of taking two hydrogens away from ethane, would be to take them off the same carbon atom.

57A. Q.—Off the same carbon atom? A.—Yes. And there we have a different radical. The technical term is isomeric radical. When two free valencies issue from the same carbon in the radical, it can be called di-valent. Then sometimes it has three valencies from one group; that would be tri-valent. They have a markedly different set of chemical properties.

MR. ROBINSON: 58. Q.—When you say “they” what do you
40 mean? A.—Divalent radicals as against radicals of the ethylene type.

59. Q.—Ethylene and ethylidene would be markedly different?
A.—Yes. They have markedly different properties. I might illustrate that by mentioning if we add OH groups to the ethylene radical—

HIS LORDSHIP: 60. Q.—OH groups? A.—They are not on the chart.

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61. Q.—No. A.—They might be compensated for. If there were added on to each of these free radicals, two OH groups, we would have ethylene glycol, and that is anti-freeze used in automobiles. But if we add two OH groups to the ethylidene radical, we get a substance which is not stable any more than carbonic acid is stable. It loses water, and both our free bonds become attached to the oxygen atom derived from the hydroxy groups; and that substance is a very volatile liquid, boiling at room temperature, called aldehyde. That happens to be the intermediate in some of the synthetic rubber
10 syntheses. I mention that fact to illustrate the chemical difference between the ethylene type of radical and the ethylidene type, which is divalent.

MR. ROBINSON: 62. Q.—Both have the same number of carbon and hydrogen atoms? A.—Yes.

HIS LORDSHIP: 63. Q.—And the same number of hydrogen atoms removed? A.—Yes.

MR. ROBINSON: 64. Q.—They both have the same number of free valencies, the same number of carbon atoms and the same number of hydrogen atoms? A.—Yes.

20 65. Q.—But the arrangement being different, they behave differently? A.—Yes. The essential difference being that the two valencies come off one carbon atom in the one case instead of one from each carbon atom, which makes a major difference chemically.

66. Q.—Again referring to the note at the bottom of the chart, Exhibit D-57: “R is any organic radical, with certain exceptions”. In the case of a compound whose formula is shown at E.3—that is, the xanthates—what are those exceptions? That is, what can R not represent in the xanthate formula, E.3? A.—Well, one class of radicals which are exceptions would be radicals of this divalent ethyl-
30 idene type.

66A. Q.—Do you restrict that to ethylidene or is that an example? A.—That is an example. But any organic radical which has got two free valencies issuing from a single carbon atom would be eliminated.

66B. Q.—What else, if anything, would be eliminated? What other exceptions are there? A.—The other major exception I think of is when radicals are derived from benzene.

66C. Q.—What are those radicals called? A.—They are called aryl. There is an example here on No. 10.

40 66D. Q.—You have referred to benzene. It might be useful to explain what benzene is. You have spoken of it as a class? A.—Yes, that is true.

HIS LORDSHIP: 66E. Q.—Radicals derived from benzene? A.—Yes.

66F. Q.—Such as aryl.

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MR. ROBINSON: 66G. Q.—Is that radicals derived from benzene such as aryl, or is aryl another word? A.—Aryl is the definition.

HIS LORDSHIP: 66H. Q.—It is the definition of radicals that are derived from benzene? A.—By removing a hydrogen atom from benzene or a derivative of benzene. There are a great number of such radicals.

MR. ROBINSON: 66I. Q.—Perhaps you would explain to his Lordship by reference to the chart, what you are talking about when you say “benzene.” A.—Yes. My Lord, benzene is a compound of
10 carbon and hydrogen, which occurs in coal tar in great amount, and the formula is C_6H_6 .

HIS LORDSHIP: 67. Q.—That is 6 carbons and 6 hydrogens? A.—Yes. And after a great deal of research it has been found that those six carbons are linked together to make a six-member ring, and then we have six hydrogens attached one to each carbon.

68. Q.—Oh, yes. A.—That is benzene.

MR. ROBINSON: 69. Q.—You refer on the chart now to what formula? A.—This is leading up to formula 10. Then, if one of those hydrogens is removed, we have the phenyl radical.

HIS LORDSHIP: 70. Q.—Does it make any difference from which
20 carbon it is removed? A.—No. The carbons in benzene are exactly the same. So it makes no difference there. If, however, we went on and discussed derivatives of benzene, where some of the other hydrogens were replaced by other groupings, then of course it would make a difference, because the molecule would no longer be perfectly symmetrical, and all of the possibilities exist. The interesting thing about benzene and the phenyl radical is that the chemistry of the unit as a whole is very different from that of ordinary alkyl radicals; and that originates in the fact that in the phenyl radical we have got
30 a symmetrical distribution of unsaturated or double bonds. Your Lordship will note that the bonds of each carbon atom. add up to 4. The two bonds join alternate carbon atoms, to make the 4; and it turns out that compounds containing this phenyl nucleus have different properties. Apparently the beautiful symmetrical arrangements of the bonds give every unit great stability and confer peculiar chemical properties on it.

71. Q.—Each one of the carbons is satisfied by four separate bonds? A.—Exactly. They are satisfied by four separate bonds. They are united in fours and the double bonds, symmetrically situated
40 around the ring, give the ring as a whole unusual properties. That means that in practice the whole of the radicals derived by direct removal of a hydrogen from that ring differ chemically very substantially from the ordinary aliphatic radicals.

MR. ROBINSON: Q. 72.—I was going to ask about that. There is on the chart this heading “aliphatic radicals” and down below is the heading “aryl radical”. What is the basis for that? Is it because the

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aliphatic radicals are restricted to the radicals actually shown on the chart, or has it a broader significance? A.—No. It is one of the broader significance? A.—No. It is one of the broadest words, I think, in organic chemistry.

73. Q.—What is the essential difference between aliphatic radicals on the one hand and aryl radicals on the other hand? A.—The essential difference is that the free valencies of an aliphatic radical do not issue directly from a benzene ring; and aryl radicals are those in which the free valency does come directly from a benzene ring. Of course, there are a very great number of aryl radicals, because it is always possible to replace those other five hydrogens by a vast number of other chemical combinations.

HIS LORDSHIP: 75. Q.—If you replace one of them by another carbon? A.—Yes.

76. Q.—The computations you could have are almost—. A.—They are enormous, my Lord; for example, if we take one hydrogen and replace that with methyl radical that would give us methyl benzene which is toluene, and then three more hydrogens could easily be replaced by a nitro group, NO_2 , and that would give tri-nitrotoluene, which is the high explosive that is used.

MR. ROBINSON: 77. Q.—TNT? A.—TNT; that is an illustration of how these radicals multiply in number with every change.

78. Q.—I see the difference in structure between aryl and aliphatic radicals. What effect has that, speaking generally, on their behaviour in chemical reactions? A.—The behaviour is very marked.

79. Q.—Perhaps I should say it is not the structure that is affected, but speaking generally what are the differences in behaviour in aliphatic and aryl radicals in chemical reactions? A.—What it comes down to is that as a matter of experience all of the aryl radicals have been put into one group, one broad group, because by and large they resemble each other vastly more than they resemble any aliphatic radical, and those in the aliphatic series resemble each other more than they resemble an aryl radical. It is just simply experience which led to this great division in organic chemistry.

80. Q.—Can you give us an example of these differences in behaviour? A.—Well, the most relevant example is that, as far as I can find out, we cannot use an aryl radical in a xanthate.

HIS LORDSHIP: 81. Q.—Cannot use— A.—An aryl radical in a xanthate, that is to say, on the big chart R in formula E-3.

MR. ROBINSON: 82. Q.—Exhibit D-57. A.—Yes.

HIS LORDSHIP: 83. Q.—So that is one of the exceptions? A.—That is one exception, that as far as I can discover no one has ever yet succeeded in putting aryl radical in the position R in—

84. Q.—In E-4? A.—In E-3.

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MR. ROBINSON: 85. Q.—That is the xanthate formula? A.—In the xanthate formula.

HIS LORDSHIP: 86. Q.—In E-3? A.—Yes.

MR. ROBINSON: 87. Q.—What about the aliphatics? A.—There is a large number of aliphatic radicals which can be used for R.

HIS LORDSHIP: 88. Q.—With the exception of the radicals of the ethylidene type? A.—Exactly, that is the other exception.

MR. ROBINSON: 89. Q.—You say there are a large number of aliphatic radicals. You mean that except for the divalent type the
10 aliphatic radicals are all right—you can make xanthate with an aliphatic radical but cannot with an aryl radical? A.—Yes, that is the situation. Of course, I would like to comment that the aliphatic radical series is enormously wide, and it contains radicals in which the free valency does not necessarily come on carbon, so I am always implying in that it is a carbon aliphatic radical.

90. Q.—In a sense that shows from the formula? A.—Yes.

91. Q.—But the linkage from the O to the R in E-3 must be to a carbon atom in the R? A.—That is the point.

92. Q.—Now, Mr. Higgins has given his view about the meaning
20 of the expression, “alkyl radical.” It is at question 55, my Lord, page 74, on the first day.

HIS LORDSHIP: Pardon me just a moment. We might have a recess now.

—Court recessed for ten minutes.

MR. ROBINSON: My Lord, I was referring to what Mr. Higgins had said about alkyl radicals at question 55, page 74, on the first day. Mr. Higgins said, “the alkyl radicals are the residue”—the report says “hydrate”, but I presume that is a mistake for “hydro”. The words are written together, my Lord, hydrocarbon.

30 MR. GOWLING: Would my friend mind if we corrected it all the way down that page?

MR. ROBINSON: It is the reporter’s mistake. It comes in a number of places. You see it comes twice on that line, my Lord, and then I think it comes again lower down on the page. In Mr. Gowling’s question 57 your Lordship will notice on the fourth line “hydrate carbon” and similarly in the first line of the answer it should be hydrocarbon.

HIS LORDSHIP: “A saturated hydrocarbon”.

MR. ROBINSON: I think those are the only ones but anyway
40 your Lordship will have the point in mind. Mr. Higgins said:

“The alkyl radicals are the residue of hydrocarbon groups, the saturated hydrocarbons.” Methane is the first of them, CH₄. That is marsh gas.”

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Then in answer to his Lordship he went on to say:

“There are a number of these alkyl radicals. Ethyl is one of them, and propyl, butyl, amyl and hexyl, and so on, a good many of them. They differ from each other by one carbon and two hydrogens.”

That is Mr. Higgins' view about the meaning of the expression “alkyl radicals.”

93. Q.—Mr. Higgins has referred to “saturated hydrocarbons.” What are those, Dr. Purves? Perhaps you could illustrate again by
10 reference to the chart, exhibit D-86? Perhaps you had better mark that D-86. A.—A saturated hydrocarbon would be one in which no two carbon atoms share any more than a single bond. On the chart ethane, for example, is a saturated hydrocarbon because there is only one bond common to the two carbon atoms.

HIS LORDSHIP: 94. Q.—Only one bond common to the two carbon atoms? A.—Yes.

MR. ROBINSON: 95. Q.—There is one bond between them? A.—One bond between them.

HIS LORDSHIP: 96. Q.—In methane? A.—In ethane, but when
20 we come down to No. 9 on the chart which is called propylene we observe that the second and the third carbon atoms share two bonds. Of course, the valency of four for each carbon is compensated because we only have two hydrogen atoms on the terminal carbon instead of the usual three in a saturated hydrocarbon, so that all the carbon valencies add up to four just as they should.

MR. ROBINSON: 97. Q.—I thought it would be useful that we should know what saturated hydrocarbons are as they have been referred to. What have you to say about Mr. Higgins' definition of “alkyl” or “alkyl radical”? A.—It is a good definition, and it is
30 the strictest, most precise, narrowest definition which is accepted in text books.

98. Q.—You say it is the strictest definition?

HIS LORDSHIP: And the narrowest.

MR. ROBINSON: 99. Q.—The narrowest; do I understand there are others? A.—Yes, in books or reference the definition of the word “alkyl” is varied, and it also varies in current usage.

100. Q.—What on Mr. Higgins' definition would be the relation between alkyl radicals and aliphatic radicals? A.—Alkyl radicals would be one precise subsection on Mr. Higgins' definition of the very
40 much wider aliphatic group.

101. Q.—When you say aliphatic group—A.—Of radicals.

HIS LORDSHIP: 102. Q.—Would you say that the alkyl radicals are a group of the aliphatic radicals? A.—Yes, one section of a very much wider territory on the precise definition which Mr. Higgins gave to alkyl radicals. They form one fraction of the wider field.

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103. Q.—He speaks of the alkyl radicals as being the residue of hydrocarbon. What do you mean by “residue”? A.—What is left after one hydrogen is removed.

104. Q.—After one hydrogen is removed? A.—And we are left with that free valence which must unite with something to confer permanence on the grouping.

105. Q.—Then in that respect with one hydrogen removed it would be exactly similar to one of the radicals you described as an aliphatic radical in the methyl? A.—That is right.

10 MR. ROBINSON: 106. Q.—Do I understand that residue and radical mean the same thing? You were explaining to his Lordship what residue meant and as I understood it you said it is what is left when, for instance, you take one carbon off methane? A.—Yes, I was using it in that sense.

107. Q.—The terms are more or less interchangeable? A.—They tend to be, but “radical” is the proper term which I should have used when I said “residue”.

HIS LORDSHIP: 108. Q.—That is, residue and radical mean the same thing? A.—Yes, as I used the word.

20 MR. ROBINSON: 109. Q.—You suggested Mr. Higgins should have used the term “radical” instead of “residue”? A.—“Radical” is the accurate one, and I apologize to the court because I thought that “residue” originated with me instead of with Mr. Higgins.

HIS LORDSHIP: 110. Q.—Pardon? A.—I thought the word “residue” was a slip of my tongue.

111. Q.—No, it was not.

MR. ROBINSON: 112. Q.—I wanted to clear up what the relation between these two words was? A.—“Residue” is very frequently used instead of “radical”.

30 HIS LORDSHIP: 113. Q.—“Radical” is the precise term, the accurate term? A.—“Radical”, I think, is the better term to use.

MR. ROBINSON: 114. Q.—What about these other possible definitions of alkyl that you mentioned? What can you say about those? A.—Well, the other definitions of alkyl vary in the territory that they take up, but there is one precise thing that I could say on that, that the territory occupied by alkyl never exceeds the aliphatic series so that in the widest sense you can draw a limit to alkyl by opposing it to aryl. That again is standard practice and usage.

40 115. Q.—So that at the narrowest alkyl radicals are a group in the general class of aliphatic radicals, and at the widest they are used in contrast to aryl radicals? A.—To aryl; that is the situation, and those are the sort of precise limits I can put on the meaning of that word.

116. Q.—You can put precise limits but you cannot be precise within the limits? A.—Yes.

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117. Q.—Within the limits different people deal with them in different ways? A.—Yes, that is the situation. Usage varies inside that.

118. Q.—Now, Dr. Purves, would you look at exhibit D-61 which is the list of xanthates. There is one point before I go into that. Can you suggest any authorities where the expression “alkyl” is used in that wider sense that you speak of, that is, in contrast to aryl? A.—Well, it very often occurs when someone is making a general statement. For example, if they are denoting a residue R
10 in some general formula they very often say that R will be alkyl or aryl, and that is the definition, alkyl or aryl. That comes up repeatedly in chemical literature, the broad distinction between the two types.

119. Q.—Have you in your mind any places where that can be found? A.—Yes. I checked that in the Encyclopedia Britannica, in the 11th edition.

120. Q.—Not the current edition? A.—Not the current one, the 11th edition.

121. Q.—That is pre the last war.

20 HIS LORDSHIP: 122. Q.—The last English edition? A.—The last English edition. For example, if one looks up the article on aldehyde you will find the formula for aldehydes. Then there will be R in the formula and then it will say, “R equals alkyl or aryl.” Then I think with ketones you find the same thing used.

MR. ROBINSON: 123. Q.—Turning the exhibit D-61, would you tell us which of the radicals mentioned in that list—perhaps the easiest way would be to refer to the numbers which are at the lefthand margin—are alkyl in the strictest sense of the word that we have been discussing, and that Mr. Higgins puts forward? A.—Well, we
30 might begin with No. 1.

HIS LORDSHIP: 124. Q.—Allyl? A.—Yes.

MR. ROBINSON: 125. Q.—What I had in mind was for you to give us a list of those that are alkyl in the strictest sense and then any that are left we can deal with afterwards? A.—Well, No. 2 on the list is in the strictest sense of the alkyl definition.

HIS LORDSHIP: 126. Q.—That is amyl? A.—Yes.

127. Q.—That appears in Mr. Higgins’ chart.

MR. ROBINSON: I think it appears in the chart, and it certainly appears among Mr. Higgins’ examples in that question I was referring
40 to, question 56, I think. It may well appear in the chart, exhibit P-54. Did your Lordship want to look at P-54? Mr. Registrar, give his Lordship exhibit P-54.

HIS LORDSHIP: 130. Q.—Five carbons and eleven hydrogens? A.—Yes.

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MR. ROBINSON: 131. Q.—Incidentally, is it pronounced “amile” or “amil”, or is it simply that some pronounce it in one way and one in another? A.—I think that is exactly the position. I have heard it both ways, and I probably oscillate between the two pronunciations myself.

132. Q.—Going on, then,—A.—The next one I see here is No. 5, that is butyl. That is a C_4 radical.

HIS LORDSHIP: 133. Q.—With nine hydrogens? A.—Yes, it would be nine hydrogens.

10 MR. ROBINSON: 134. Q.—Amyl is C_5 and nine hydrogens? A.—Yes.

135. Q.—So butyl is the next one down in that series? A.—Yes. If your Lordship is interested you can always check whether the radical obeys that strict definition by counting the hydrogens. If there are carbons there are twice as many hydrogens plus one. Putting it in mathematical language, that agrees with Mr. Higgins’ definition. The formula of an alkyl radical is $C_nH_{2n}+1$.

20 136. Q.—Incidentally, you speak of butyl. There are different kinds of butyl mentioned—*isobutyl*, *normal butyl* and other butyls. They are all in the same position, are they, as far as falling within this strict definition? A.—Yes, they are all in the same position on Mr. Higgins’ definition.

137. Q.—They are all butyls, but they are different kinds of butyls? A.—Yes. I can explain that if it becomes necessary.

MR. ROBINSON: It is not relevant, perhaps, unless his Lordship is interested in it.

HIS LORDSHIP: I do not know that it is relevant.

30 MR. ROBINSON: 138. Q.—Will you proceed, Dr. Purves? A.—The next one I see on this list is No. 7, *cetyl*. That is a big radical, with 16 carbons in a long chain, joined carbon to carbon. So there we would have twice 16, that is 32, plus 1 hydrogens, that would be 33 hydrogens. That would be $C_{16}H_{33}$ for that radical. That would fall inside Mr. Higgins’ definition.

HIS LORDSHIP: 139. Q.—The number of carbon atoms does not affect it? A.—Not as long as you stick to $C_nH_{2n}+1$.

140. Q.—That is what I mean. The number of carbon atoms does not enter into the definition? A.—No.

40 141. Q.—Do you mean you can keep on going with the carbon atoms so long as you add twice as many hydrogen atoms plus one? A.—Yes.

412. Q.—Indefinitely? A.—Well, yes, indefinitely is the phrase. It depends on the amount of work which individual organic chemists put into isolating or synthesizing compounds in that series. They have gone up to about C_{100} up in that order of magnitude in special researches.

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MR. ROBINSON: 143. Q.—What is the next one after cetyl?
A.—The next one here is No. 9, that is ethyl.

144. Q.—We know about that. That is on Exhibit P-54. That is one of the simple ones, with two carbon atoms?

HIS LORDSHIP: 145. Q.—That is C_2H_5 ? A.—Yes. Then we have No. 13, methyl, which was mentioned as one of the first of the series. Then we have No. 14, which is propyl. That is all I see here.

MR. ROBINSON: 146. Q.—Nos. 2, 5, 7, 9, 13 and 14 have the alkyl radicals in the strictest sense of the term. Have all the radicals
10 shown on Exhibit D-61 any common characteristics from a classification point of view? A.—Yes, There is one characteristic that they all have, and that is that they are monovalent, as we define that word. There is never more than one free bond exposed on any one carbon atom.

147. Q.—It follows, I suppose, from what you have said before that you cannot form a xanthate with an aryl radical, as they are all aliphatic? A.—Yes.

148. Q.—All the radicals mentioned in D-61 are aliphatic radicals? A.—Yes.

20 149. Q.—Now Dr. Purves, being more specific, what is the position with regard to the radicals that are left after you have considered those six that are in the strictest sense of the word alkyl? A.—The position is that those others all infringe that strict definition; the others are not included in that strict definition.

HIS LORDSHIP: 150. Q.—They all infringe the strict definition? A.—Yes, in one respect or another.

MR. ROBINSON: 151. Q.—Have they common characteristics among themselves, apart from their all being aliphatic, or are they of various types? A.—I would say they are of various types.

30 152. Q.—Taking, for instance, allyl, No. 1, what sort of radical is it, and why is it not in the strict definition? A.—The difficulty with allyl is that it is not saturated. In fact, my Lord, if you consider formula 9 on Exhibit D-86, the allyl radical is really formed by the removal of one hydrogen from the left-hand carbon atom. It make a difference, of course, which carbon atom we take the hydrogen from, but the allyl group happens to be formed by the removal of a hydrogen from the left-hand carbon group.

40 153. Q.—That is from propylene? A.—Yes. Allyl is just a long-standing trivial name for one of the radicals derived from propylene, which is an unsaturated hydro-carbon.

MR. ROBINSON: My Lord, there is often great difficulty in this field with regard to some compounds that were discovered early on and were given specific names, for you find things such as Dr. Purves has mentioned, allyl, which do not fit into a systematic classification. Yet, everybody continues to use those names. For a beginner in the

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field it is rather disconcerting, because such names do not indicate the constitution, as you expect them to.

HIS LORDSHIP: Are you referring to the termination “yl”?

MR. ROBINSON: Yes, my Lord; and sometimes not only the termination but the beginning of the word also has no relation to the classification.

154. Q.—Now Dr. Purves, the next one that is outside the strictest definition of alkyl is benzyl. What sort of radical is it?

A.—The benzyl radical is really the methyl radical. It is No. 4 on
10 Exhibit D-86, but one of the hydrogens has been replaced by the phenol radical. So that rates as an aliphatic radical, because the free bond is not attached to a carbon atom in the phenol ring. It is a methyl radical with a phenol joined to the carbon. So that infringes the strictest definition because it is not in the aliphatic series of hydrocarbons; it is derived from a mixed hydro-carbon, and it has got a ring in it. There is a hybrid name that is sometimes used—arylalkyl—to show that there is a fusion of aryl and alkyl, with the “alkyl” coming last to show that that is the part of the radical containing the aliphatic free valence.

20 155. Q.—The part that contains the free valence is the part that reacts? A.—Yes. So it reacts as an aliphatic material.

156. Q.—How about bornyl? A.—Bornyl is a hydro-carbon which is saturated, but the carbon atoms instead of being in an open chain close around themselves in a ring.

157. Q.—It has no double bonds? A.—It has no double bonds.

158. Q.—But it is in the form of a ring? A.—Yes, the carbon atoms form a ring. And there are various other carbon atoms attached to the ring. It is an aliphatic material, because the ring is not a benzene one. It is still aliphatic, but they are in a ring and it
30 is going to infringe a strict definition because it is a ring.

159. Q.—It is going to infringe a strict definition because it is a ring, you say? What about the number of carbons in relation to the number of hydrogens? A.—It will infringe that too, if we have a straight chain of hydro-carbons. One might get that on No. 6 in D-86. If that system is continued for six carbon atoms, then the ends are joined carbon to carbon. In that joining you would drop or lose the two end hydrogen atoms. So it will never agree with the formula C_nH_{2n+1} ; it will be C_nH_{2n-1} .

HIS LORDSHIP: 160. Q.—Is it the essence of an alkyl radical
40 that there shall be twice as many plus one hydrogen atoms as there are carbon atoms? A.—Yes. That follows from Mr. Higgins' definition that one differs from another by CH_2 , and the first one is CH_3 .

MR. ROBINSON: 161. Q.—Are there any other radicals on the list in Exhibit D-61 that can be disposed of in the ground that they

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are like bornyl? A.—Bornyl is a complicated type of which the simplest number is No. 8, cyclohexyl. There we have got six carbon atoms in a saturated system, but the ring is closed.

162. Q.—That was the example that you gave us a moment ago?
A.—Yes.

163. Q.—Where you folded up the straight chain and joined the ends together? A.—Yes.

164. Q.—So cyclohexyl is going to infringe the C_nH_{2n+1} rule?
A.—Yes.

10 165. Q.—Is there any other that would go along with bornyl?
A.—There is another one, No. 12, menthyl xanthates. That again is built up on a saturated hydro-carbon, but the carbon atoms form a ring. So that again would infringe the C_nH_{2n+1} formula.

166. Q.—What is the general name of compounds like that where you have got a ring that is not a benzene ring? A.—The ring is numbered according to the number of carbon atoms.

167. Q.—Is there any general name for compounds of that type?
A.—Carbocyclic.

20 168. Q.—Is carbocyclic the same as cyclic? A.—Cyclic covers more territory.

HIS LORDSHIP: 169. Q.—Carbocyclic compounds are a combination of carbon atoms that unite with one another in a ring?
A.—Yes.

170. Q.—And there are no hydrogen ends? A.—Exactly.

MR. ROBINSON: 171. Q.—But the expression “carbocyclic” excludes the benzene ring? A.—Yes.

HIS LORDSHIP: 172. Q.—The benzene ring is a different kind?
A.—Yes.

30 173. Q.—Because in a benzene ring there may be double bonds?
A. Yes. A benzene ring has very peculiar characteristics which set it apart from the carbocyclic structure, the general formula C_nH_{2n} , because the groups would be CH_2 right around the ring, and then it would be closed. The individual rings may be called cyclohexane, the “hex” meaning six; or you may have cyclopentane or cyclooctane.

174. Q.—Thus indicating how many carbon atoms there are in the ring? A.—Yes.

175. Q.—We have disposed of Nos. 1, 3, 4, 8 and 12. I am jumping the ones that are strictly alkyl. What about No. 16?

30 A. That in a way is a more complicated case of the benzyl radical, because in this tetrahydronaphthol radical we have got the benzene nucleus but it is fused into an aliphatic ring and the valence comes off the aliphatic ring.

185. Q.—So it is a combination or a fusion of a benzene ring and a carbo-cyclic ring? A.—Yes, that is exactly what it is.

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186. Q.—The two different types of rings are linked to each other? A.—Yes, they are joined. I could draw a picture if it is necessary.

187. Q.—Unless your Lordship would like it, I do not think it is really essential for an understanding of the points involved. Does your Lordship want him to do that?

HIS LORDSHIP: No. Would this be a convenient place to adjourn? You have dealt with some of these on the list and have yet, to deal with some more.

10 MR. ROBINSON: Yes, there are some others.

HIS LORDSHIP: Of a different character.

MR. ROBINSON: They are a bit different. It would be a perfectly convenient break, my Lord.

HIS LORDSHIP: Then we will adjourn until Monday at 10.30.

—The Court adjourned at 4.20. P.M. until Monday, November 20th, at 10.30 A.M.

OTTAWA, MONDAY, NOVEMBER 20TH, 1944
MORNING SESSION

CLIFFORD B. PURVES,

20 EXAMINATION BY MR. ROBINSON, Resumed:

MR. ROBINSON: My Lord, on Friday we were discussing Exhibit D-61 and various organic radicals mentioned in it.

HIS LORDSHIP: And those that were alkyl radicals in the strictest sense.

MR. ROBINSON: First of all we took those that were alkyl radicals in the strictest sense, and then we took some others—

HIS LORDSHIP: Some others that were aliphatic radicals, but were not alkyl radicals within the strict definition adopted by Mr. Higgins.

30 MR. ROBINSON: That is it, my Lord. But we have not completed the discussion of Exhibit D-61.

188. Q.—For the purpose of further discussion, Dr. Purves, I understand you have a chart which you think it would be useful for his Lordship to have? A.—Yes.

HIS LORDSHIP: How do you describe that chart?

MR. ROBINSON: It is headed, "Chart of Glycerol and Cellulose and their radicals."

EXHIBIT D-87: Filed by { Chart of Glycerol and Cellulose
Mr. Robinson { and their radicals.

40 HIS LORDSHIP: Did I understand you to say you had not quite completed your examination of D-61?

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MR. ROBINSON: No, my Lord, we have not. There are some compounds that are still to be dealt with.

189. Q.—Dr. Purves, there are some organic radicals on Exhibit D-61 which we have not dealt with. They include glyceryl, which is No. 10; cellulose, which is No. 6, and starch, which is No. 15. Is there any general statement that you can make about these, and for the purpose of any statement that you may want to make you may if you wish, refer to the chart which has just been put in as Exhibit D-87. A.—My Lord, I would first like to consider the meaning of
 10 glycerol xanthates, which is No. 10 on D-61. On D-87, under No. 11, we have the formula for glycerol. That differs from the alcohols which we have mentioned in the fact that we have three alcoholic groups, three OH groups, in the glycerol molecule, each OH being attached to a different carbon atom. So that substance is really an alcohol three times over. The radical corresponding to that would be No. 12 on D—87, and there we have three free valencies to which the OH groups in glycerol are attached. That then is the glyceryl radical. It is possible to substitute all three valencies with many compounds, with many other radicals. For example, if we put nitrate radicals on
 20 each of these three valencies we get tri-nitroglycerine, which is a high explosive; and then if we put on three chlorine atoms, that is a large-scale industrial process; then the chlorine atoms could be replaced by alcoholic groups, which would give us glycerol, and that again is a large-scale process to-day. The three valencies need not be attached in a molecule to the same group. In fats and oils we have a mixture of fatty acid units, two, sometimes three attached to the same glyceryl radical. So in all those reactions that radical acts as though it was simply the fusion of three simple alkyl radicals. Just as ethylene, which is pictured on D-86, can be regarded as the fusion of
 30 two methyl radicals, then the glyceryl can be regarded as the fusion of three in the same sense, those valencies acting substantially in an independent way.

HIS LORDSHIP: 190. Q.—Could it be described as an alkyl radical? A.—If we add to that formula C_3H_5 , it would not fall inside the strict definition of alkyl which Mr. Higgins has given. On the other hand, if we take other definitions—for example, my Lord, in Watts' Dictionary of Chemistry, we would find that the definition there for an alkyl radical is simply an alcoholic radical. In the same dictionary, under alkyl acetates, we find that glycerol tri-acetate is
 40 listed as an alkyl acetate. That you see happens to be a wider definition than the strict one we considered.

HIS LORDSHIP: I was looking over the transcript, and I see that in several places the reporter has put "alkali" instead of "alkyl" radical.

MR. ROBINSON: I think that not only in Dr. Purves' evidence, but in Mr. Higgins' evidence there are changes of that kind, which I am sure my friends and I can agree upon.

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HIS LORDSHIP: You will see that they are checked?

MR. ROBINSON: Yes, and we can see that they are entered in your Lordship's copy.

HIS LORDSHIP: There will not be any difficulty about correcting that; but the record ought to be corrected.

MR. ROBINSON: 191. Q.—Dr. Purves, I am not sure that I heard the beginning of your last answer. You referred to some authority in which an alkyl radical is indicated as being an alcoholic radical. Did you say what that authority was?

10 HIS LORDSHIP: Yes; Watts.

THE WITNESS: Yes, Watts' Dictionary of Chemistry.

MR. ROBINSON: 192. Q.—What can you say about the glyceryl radical from the point of view of the way in which it enters into chemical reactions? A.—It enters into chemical reactions with the three monovalencies acting substantially independently as though it were three methyl alkyl groups fused together in just the same way as No. 7 on D-86, the ethylene radical, can be regarded as substantially two methyl radicals fused together.

20 230. Q.—Now, Dr. Purves, you have discussed glycerol. Is there anything more you wanted to say about that? A.—The xanthate, which is glycerol xanthate, that has been prepared has got a xanthate group on one of those three univalent radicals in the glyceryl radical, and then we have alcoholic groups on the other two, so that the xanthate reaction has gone incompletely. There are three groups which might have conceivably been replaced by xanthate and only one of the three has actually been replaced by xanthate.

231. Q.—So that as I understand it you can have the same reactions with glycerol in which other radicals, which may be the same or different ones, will become attached to each of the possible
30 three valencies or you can have reactions where these radicals will become attached to only one? A.—Yes.

232. Q.—What about two? What about the possibility of their becoming attached to two and not to three? A.—In general?

233. Q.—Yes, in general? A.—That also can be done because when glycerol is treated with hydrogen chloride gas it happens that two of the three radicals are replaced, but the third one is more sluggish in its reaction and special methods would be necessary to replace the third one. That often happens in these polyvalent acohols. I should like to mention in that connection the use of the word
40 "polyvalent" because I explained before that divalent radicals contained two valencies issuing from the same carbon atom. I made that distinction. I should like to amplify that by saying in cases like this—

234. Q.—When you say "this"— A.—Like the glyceryl radical that sometimes would be called trivalent, but that word "tri" is a cloak for two different things, so that the word in usage can be a cloak

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for two quite different things, three monovalent radicals coming from three different carbon atoms or sometimes three issuing from one. It makes a very great difference chemically but the nomenclature creates a fog over that chemical distinction.

235. Q.—You have said what you want to about glycerol. Perhaps you might turn now to cellulose.

HIS LORDSHIP: 236. Q.—Would the salt that would be formed from that which would be a xanthate salt have different properties from other xanthates? A.—I think the properties would be substantially the same, the same sort of salt which would give anions and cations in solution, and the radical xanthate unit once in the molecule would behave just as other xanthate units do in say ethyl xanthate or propyl xanthate. That inference, my Lord, follows from the observation that the three radicals are substantially independent.

237. Q.—And that the whole is really a fusion of three ethyl—. A.—Of three methyl.

MR. ROBINSON: 238. Q.—Now, Dr. Purves, perhaps if you would turn to cellulose, for which you have some formulae at the bottom of exhibit D-87; what have you to say about that? You have
20 been discussing glycerol. Now I would like you to turn to cellulose? A.—On D-87, formula 13, I have a diagram of a portion of the cellulose molecule. You will observe that it has six carbon atoms in a row. Then we have three alcoholic groups on these carbon atoms.

238. Q.—When you say “alcoholic groups”, what do you mean by that in terms of the symbols used on the chart? A.—I mean the OH group. It is usual to call them alcoholic groups when we are dealing with aliphatic radicals because we also have an OH group attached to the phenyl radical. For example, if we put the OH group on to No. 10 in D-86, that is the phenyl radical, we would call that the
30 phenolic OH group because its properties are so very different because it is attached to an aryl radical rather than an aliphatic one. In fact, phenyl OH on No. 10 gives us carbolic acid, and that is a slightly acidic strong corrosive disinfectant whereas these are neutral substances of an alcoholic type.

239. Q.—I simply interrupted you because I wanted to make clear what the relation was between the chart and your expression, “alcoholic group.” A.—My Lord, diagram 13 on D-87 is only a fragment of the cellulose molecule but that fragment is repeated as it stands—some hundreds of times. So we have got a very long molecule.
40 The points of attachment of the similar groups are marked on the chart by arrows so that if we join it up by those arrows we can get a very long chain which would be the cellulose molecule. In rayon stockings we have perhaps 400 of these units lined up. Then in cotton shirting, broadcloth, there may be as many as a thousand.

240. Q.—What is each of these units? A.—They are derived from corn sugar by the loss of the elements of water. Cellulose can

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be resolved in quantity yield into corn sugar although, of course, there is no interest in doing that on a large scale. There is some interest now in war time. The conception that we have there of cellulose is that the molecule contains many hundreds of carbon atoms. In fact, with 400 of those units there would be 2,400 carbon atoms in a single molecule. Then, half of those carbon atoms would be carrying alcoholic groups so we would have 1,200 radicals in the one giant molecule. Experience has shown that all I have said about the independent action of these univalent radicals for glycerol applies
 10 with equal force to the radicals in cellulose even though there are hundreds of them. A sample of the radical, one unit of the radical, is shown in No. 14 on the chart. For example, we can get cellulose trinitrate which is a high explosive or we can nitrate some of the positions and then leave a few alcoholic groups as they are and we come out with pyroxylin lacquers.

260. Q.—What about cellulose xanthate? What is the position there? A.—Then in the cellulose xanthate we have a somewhat indefinite compound. Some of the alcohol groups are replaced by the ordinary xanthate method, by xanthate groups, and the tri-
 20 xanthate—in each of these units, 13 and 14, we have got three xanthate groups with each of the there radicals—can be made. But the xanthate which we were discussing would only have about half of one xanthate group as alcohol; that is to say, when we have, for example, 1,200 of these free unit valences, we might have perhaps 200 occupied by xanthate groups and then the other 1,000 would still remain alcoholic. That is the technical product which is used, for example, in the manufacture of viscose—cellophane, rayon stockings, and so forth.

261. Q.—When was cellulose xanthate originated, Dr. Purves?
 30 A.—That was originated or rather discovered by Cross, Bevan and Beadle as early as 1893, or in that period 1892 to 1893. It is interesting to note that they knew cellulose could be regarded in many chemical reactions as a molecule containing numbers of these alcoholic groups, or of these little radicals; and they said to themselves, “if this is so, then cellulose ought to go through the xanthate reaction just like one of the simpler alcohols, methyl or ethyl.” That reaction is very familiar, and so they applied the same xanthate reaction to cellulose, and by so doing they founded the viscose industry and the rayon industry.

40 HIS LORDSHIP: 262. Q.—Apparently by this chart the metal they used was sodium? A.—The method that they would use?

MR. ROBINSON: I think his Lordship said “metal.”

HIS LORDSHIP: 263. Q.—Yes, the salt.

A.—Yes, that is what they used. They simply mixed up cellulose, with a strong caustic soda solution, carbon disulphide, in the ordinary method that was familiar to them and came out with this exceedingly

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viscous mixture,—the technical word is dope,—which was the cellulose xanthate with perhaps one-sixth of the possible alcoholic groups replaced by xanthate groups. The fraction replaced will depend on the exact condition of the experiment.

MR. ROBINSON: 264. Q.—Of these three, Dr. Purves, that covers glycerole and cellulose. What about starch? A.—Starch, my Lord, has the same structure as cellulose, and the difference between starch and cellulose is simply a matter of the difference in shape which these big molecules assume. It so happens that the
10 cellulose molecule can stretch out into a straight thread, but the starch molecule never seems to do that. It seems to sweep around in a wide, loose spiral. It depends on the direction and place from which the valences issue from the carbon atoms. So for present purposes, as regards the starch xanthate reaction, everything I said about cellulose can be carried across in toto to starch.

265. Q.—As I understand it, the difference between starch and cellulose are such that you could not tell them in a drawing. You would have to have a three-dimensional model? A.—Yes.

266. Q.—To show them? A.—Yes. It is very clear in three-
20 dimensions, but it is not obvious at all from diagrams such as the ones I have here, 13 and 14.

267. Q.—A while ago you spoke of an alcoholic radical in connection with a definition in Watts Dictionary of alkyl. What does alkyl or alcoholic radical mean there? You have spoken of the OH groups, but does the expression “alcoholic radical in Watts’ definition mean OH groups? And if it does not, what does it mean? A.—Well, that is the shortest definition I have ever seen for alkyl group, and the radical in the phrase “alcoholic radical” means it must be such as to give an alcohol when OH is added to the free valence.

30 268. Q.—That was what I was directing myself to. It is speaking of the other side of the alcohol? A.—Yes.

269. Q.—Not of the OH side but of the other side? A.—Yes.

270. Q.—What does “alcohol radical,” speaking of the non-OH side of the compound, mean? What does alcoholic radical mean? How would you define it? A.—It would mean that the radical has got to be in the aliphatic series, because if we attach the OH to an aryl radical, we would wind up with a phenol, not an alcohol. So you have got that particular distinction retained, which I have mentioned, between alkyl and aryl. Then the second restriction
40 would be that in that radical we could not have two valences issuing from the same carbon atom, because if we did have those two valences and added the hydroxy groups to those two, then the material would be unstable and we would not wind up with an alcohol. I think I mentioned that in connection with the methylene radical and the ethylidene radical on Exhibit D-86; that is, the formulas 5 and 8 on D-86. So that again would be implied in Watt’s definition.

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271. Q.—Therefore an alcoholic radical is something which is aliphatic and has its free valences coming from carbon atoms. But if there is more than one free valence, it must not come from the same carbon atom. A.—That is the point of that; and that is what is implied in that phrase, alcoholic radical.

272. Q.—What have you to say as to the applicability of that expression “alcoholic radical” to the radical shown on the chart, Exhibit D-87? A.—Well, that is a wider definition than the narrower one which Mr. Higgins has given.

10 273. Q.—Perhaps I misled you, Dr. Purves. What I meant was this. What have you to say as to that definition applying or not to the radicals shown on Exhibit D-87? A.—Well, it would apply, my Lord, to 12, the glycerol radical; and as a matter of fact I think in Watts Dictionary that glycerol tri-acetate is classified as an alkyl acetate.

274. Q.—What about the cellulose radical? A.—That again is an alcoholic radical.

275. Q.—Would you now turn to Exhibit D-57 and the memoranda or notes accompanying it. That is the big chart, my Lord.
20 It has been suggested, Dr. Purves, that in the formula E.3 on Exhibit D-57, R must be alkyl in order that the compound should be xanthate. Having regard to Exhibit D-61, what have you to say about that? A. Well, my Lord, the situation is that if E.3 is going to include all of the xanthates we have discussed, then it cannot have the strict, narrow definition as being always C_nH_{2n+1} . We must adopt a wider definition.

HIS LORDSHIP: 276. Q.—That is, in order to get E.3 included. A. —To include them all in E.3.

277. Q.—That is, to get all the xanthates—A.—That are known.

30 278. Q.— — to fit into E.3, you must give R a wider meaning than the narrow meaning used by Mr. Higgins. A.—Exactly.

279. Q.—You must adopt a wider definition of alkyl radical? A.—Exactly.

280. Q.—And not confine it to the narrow definition that Mr. Higgins used? A.—Yes, that is precisely the attitude I would take on that question.

281. Q.—But if Mr. Higgins’ definition of alkyl radical is adopted, that means, does it, that some of the xanthates listed on Exhibit D-61 must be included? A.—Yes. That is the position.
40 The narrow definition—at least, if my memory is correct—will include 6, I think it was, and exclude 8 strictly applied.

MR. ROBINSON: 282. Q.—You have dealt with it on the assumption of Mr. Higgins’ definition. On the assumption of the other definition which you have been discussing, what would the position

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be? A.—Well, I have made my position clear on that, I think, my Lord.

HIS LORDSHIP: 283. Q.—Then all the so-called xanthates on Exhibit D-61 would be included within the formula E.3 on Exhibit D-57 if the wider definition is given to R as including radicals? A.—Yes.

284. Q.—Alkyl radicals; within the wider definition than Mr. Higgins used? A.—Yes. My feeling about that word “alkyl” is that we can nail it down specifically in the narrow sense with Mr. Higgins, and then the next specific thing we can say is that it is not an aryl radical. Those are the two points. And then the territory in between, it seems to me I can find no solid ground to base any sort of restrictions on it inside those two fixed points.

284A. Q.—Would metallurgists know these varieties of definitions? A.—I can only speculate on that question, my Lord.

285. Q.—I mean, skilled metallurgists? A.—It would really depend, it seems to me on the—

286. Q.—Where he got his training? A.—And the work of reference he looked up.

20 287. Q.—And what work of reference he looked up? A.—Yes. If he looked up Watts under Alkyl to see what alkyl meant, he would see it meant an alcohol radical; and if he looked up another book he might find the strict definition; and then if he looked up a third book he might find a definition which fell in between those two limits. That is the situation which I think would happen to a metallurgist.

288. Q.—You merely said that Mr. Higgins definition had been the strictest definition? A.—Yes.

289. Q.—And the narrowest definition? A.—Yes. It is clean-cut, and it is very often quoted and very frequently used. I think, my Lord, the difficulty is that the nomenclature of chemistry—

290. Q.—I suppose it definitely defines the field that it purports to cover? A.—Yes, in that strict sense. The difficulty, my Lord, is that the nomenclature of chemistry is a beautifully precise instrument in describing and naming individual compounds, but it was not designed for, say, the generalities which one would get in patent work or legal work. It has to be used with great care when we come to try to cover general ranges of chemistry with those words. A great many have got clean-cut, sharp meanings and then they have got a more general meaning which has sort of diffused out in the course of time from the clean-cut meaning.

MR. ROBINSON: 291. Q.—What about sugar, Dr. Purves, in that connection? That is, in connection with your discussion of the possible meaning of alkyl? A.—I do not quite understand.

292. Q.—I mean, where would sugars fall in those definitions? Would they fall within a strict or narrow or intermediate definition?

For Defendant—Dr. Purves—Examination-in-Chief

A.—They are certainly outside the strict definition, because a sugar contains a lot of oxygen. The formula would be $C_6H_{12}O_6$, and even though they had completely substituted, and the alcohol groups were completely replaced, we would still have oxygen left in the radical, so it would not fall in the strict definition. But the general question as to whether sugar would come under alkyl radicals, as we have been using them, is just the point at which I am at sea. Any opinion I gave would be an arbitrary one, depending on my view of what was included in alkyl.

10 293. Q.—Turning now to a different subject, Dr. Purves, what does the term “alkaline xanthate” mean?

HIS LORDSHIP: “Alkaline xanthate”, did you say?

MR. ROBINSON: Yes, “alkaline xanthate”, my Lord.

THE WITNESS: The trouble there is that xanthates are neutral substances, and with alkaline xanthate you are really trying—well, it is almost like trying to find a meaning for an irresistible force meeting an immovable object.

HIS LORDSHIP: 294. Q.—It is like calling a thing a black-white?

A. Well, yes, my Lord; that is the general idea. It is like talking,
20 for example, of alkaline common salt. One wonders what kind of common salt that would be, because salt is neutral. And so something has got to be done to fix that phrase up.

295. Q.—You mean that the term “alkaline xanthate” does not make sense? A.—It does not make sense.

296. Q.—To anyone, to any chemist. A.—Not when thinking strictly about what it means.

297. Q.—It would not make sense to any chemist? A.—No. If one just looked at the phrase, just as it stood, we might think of viscose which happens to be the xanthate which is made in greatest
30 amount and is most popularized, and happens to be used in the presence of excess alkali in that commercial product. That again is alkaline xanthate, and it is really not taking into account the fact that we have got an inherent contradiction in terms in the phrase.

298. Q.—Would it be fair to say that it would be obvious to a metallurgist that alkaline xanthate did not mean a xanthate that was alkaline, since xanthates are neutral, and that consequently you would have to conclude that the use of the word “alkaline” was a slip? A.—I suppose that would depend upon the metallurgist, my Lord. It is hard for me to answer that question. I do not know if
40 a metallurgist would remember that xanthates were neutral salts. He might not see the contradiction, and what he would read into that is very difficult to say.

299. Q.—Do you think he might think that it meant a cellulose xanthate? A.—Well, he might. But on the other hand he might take that alkaline xanthate as simply a xanthate in an alkaline circuit, if he was a metallurgist; I do not know much about metallurgy.

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300. Q.—What would a chemist think of it? A.—I think a chemist at once would wonder, because he would know that xanthates were neutral salts, so that he would see the contradiction in terms. The metallurgist might or might not, depending on his training.

300A. Q.—Then would a chemist come to the conclusion that the use of the word “alkaline” was a slip? A.—He might. He would know there was something wrong somewhere with that phrase.

300B. Q.—He would know that there was something wrong
10 somewhere with that phrase? A.—Something wrong somewhere. After that, as to what it means—I think there again it would depend on the chemist.

300C. Q.—Would you agree with Mr. Higgins’ view that it was synonymous with alkali xanthate and that alkaline xanthate meant alkali metal xanthate? A.—I would agree, my Lord, that that was one of several possible meanings.

300D. Q.—Are there other possible meanings? A.—Yes, I think there are; definitely.

300E. Q.—What would the other possible meanings be? A.—One
20 possible meaning would be, for example, that the word “earth” might have been missed out—alkaline earth xanthate. That is one, putting in the word “earth” instead of the metal, without changing “alkaline.”

MR. ROBINSON: 300F. Q.—What are the alkaline earths? A.—That is the next group of metals in the periodic table, the barium, caesium and strontium; the salts or xanthates would be alkaline earth xanthates. Those alkali metal xanthates would be sodium, potassium, caesium, rubidium and lithium. Those are the five alkali metals.

HIS LORDSHIP: 300G. Q.—That would be the first conclusion
30 that a chemist would come to as to what was meant by alkaline xanthate? A.—Well, I can only recite my own experience, my Lord, in that connection; and when the lawyers for the defence first asked me what that meant, I spent a good deal of time working through all the possibilities.

300H. Q.—Before you started that search, what did you think that alkaline xanthate meant? A.—Well, first of all, my first impression was that it was simply a xanthate in an alkaline medium.

300I. Q.—You thought it was a xanthate in an alkaline medium? A.—Yes, with excess alkali, operating in an alkaline circuit. That
40 was just by internal evidence from other places in the patent.

300J. Q.—Did you think of it at any stage as a xanthate made with an alkali metal? A.—Yes. I had that on the list as a possibility too.

300K. Q.—Just as a possibility? A.—Yes; one of several.

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300L. Q.—Or was it a probability? A.—Well, I did not put down any as probabilities, I do not think; I just made a list, I think, of four different ways that one could get out of the conundrum, and that was one of them. Then alkaline earth occurred to me at a later date. The first one that occurred to me was a xanthate in an alkaline circuit.

300M. Q.—Did it strike you as being a conundrum? A.—Oh, yes, it was a conundrum, the moment the lawyers asked me to give a meaning to it.

10 300N. Q.—When you looked at it first you thought it was a conundrum? A.—Oh yes, that was a conundrum to me as a chemist.

MR. ROBINSON: 300O. Q.—Is there any difference between the expression alkali xanthate and the expression alkali metal xanthate? A.—Yes.

300P. Q.—For the benefit of the reporter, I might say that the expression is “a-l-k-a-l-i x-a-n-t-h-a-t-e” and “a-l-k-a-l-i m-e-t-a-l.”

HIS LORDSHIP: It is important that these terms be taken down correctly.

20 MR. ROBINSON: 300Q. Q.—Is there any difference between the expression “alkali xanthate” and “alkali metal xanthate? A.—Well, the point of difference in the word “metal” when one means metal, is that the word “alkali” has got a wider significance. For example, in most dictionaries, alkali will list sodium, potassium, rubidium, caesium; and then you find the word also often includes ammonium which is not a metal, in the strict physical sense.

HIS LORDSHIP: 300R. Q.—But is alkali a metal? A.—Not necessarily, my Lord.

300S. Q.—Not necessarily? A.—No. The word is one of those words where the definition varies from dictionary to dictionary.
30 They always include the alkali metal as well as a number of other things, depending on the dictionary.

300T. Q.—It is adjectival in its meaning when applied to metal? A. Yes.

300U. Q.—Certain metals are alkali metals? A.—Yes, recognized as being alkali metals.

300V. Q.—And those in the group are the five that you mentioned? A.—Yes. Two are well-known, sodium and potassium, and the other three are rarer metals.

40 300W. Q.—Those five metals are all the alkali metals? A.—Yes. That is accepted classification for those.

300X. Q.—There is not a separate metal called alkali? A.—No. That covers a lot of territory; and when we want to speak precisely of the alkali metals, the word “metal” is added to the phrase to limit or restrict the meaning of the word “Alkali” to what is meant, alkali metal.

For Defendant—Dr. Purves—Examination-in-Chief

MR. ROBINSON: Dr. Purves, you mentioned ammonium. Can ammonium xanthate be prepared? A.—It cannot be prepared just by replacing the caustic soda.

HIS LORDSHIP: I beg your pardon?

A.—It cannot be prepared by the ordinary method.

300Y. Q.—It cannot be prepared by an ordinary method?

A.—No. One has first to make xanthic acid by the ordinary method and then neutralize it with ammonia, and then ammonium xanthate is obtained. In fact, I think that was one of the first xanthic salts
10 to be made.

300Z. Q.—I understood Mr. Higgins to say that you could not make xanthates of ammonia? A.—Well, I agree with that, if one simply uses ammonium in place of caustic soda in the ordinary xanthate method, you will not get ammonium xanthate. You do not get it by the ordinary method.

300AA. Q.—If you make xanthate in the ordinary way, then you can add ammonia to that? A.—Later on, yes. But you cannot get it directly, and I would agree with Mr. Higgins on that. For example, in the large chart, my Lord, if you just tried—

20 MR. ROBINSON: 300BB. Q.—When you say “the large chart”, what is the number of it? A.—D-57. I am sorry, my Lord, for my inaccuracy. If one tried in the ordinary way just to replace the caustic soda with ammonia, instead of winding up in E.3, one would wind up at the ammonium salt of—excuse me, my Lord, for a moment, I have lost it on this big chart.

HIS LORDSHIP: Yes. I would not be surprised.

THE WITNESS: One would wind up with the ammonium salt of—

HIS LORDSHIP: One might not wind up anywhere?

30 THE WITNESS: One winds up with the ammonium salt of thio-carbamic acid with an NH_2 group in the molecule instead of an ethyl.

HIS LORDSHIP: 300. Q.—It is not anywhere on the chart? A.—I think the salt is on the chart.

MR. BIGGAR: D-14?

MR. ROBINSON: 301. Q.—Where is thio-carbamic on the chart? A.—Thio-carbamic acid—C-1 would be a thio-carbamic acid. Yes, that is the one, I think.

302. Q.—You would wind up with the salt of that acid?

A.—Yes, I think that is what it would be. It is not C-1, though.

303. Q.—That salt is not specifically on the chart? A.—No, it
40 is not specifically shown.

304. Q.—As I understand it. If you had shown the salt on the chart there would have had to be a line on the chart coming from the B line and replacing H by M?

HIS LORDSHIP: The E line simply represents salts, does it not?

MR. ROBINSON: Yes, my Lord.

For Defendant—Dr. Purves—Examination-in-Chief

305. Q.—As I understand, although ammonium xanthate cannot be made in the conventional way, it can be made in some different way?

MR. GOWLING: I do not think my learned friend should lead the witness here. This is a rather important point.

HIS LORDSHIP: He has already explained that you can make ammonium xanthate after you have made a xanthate.

MR. ROBINSON: I was trying to summarize what Dr. Purves had said.

10 HIS LORDSHIP: You have to make xanthate first before you can make an ammonium xanthate.

MR. ROBINSON: 306. Q.—Is that the position, Dr. Purves? A.—Yes.

307. Q.—When his Lordship says xanthate, what sort of xanthate? A.—You can make one of the common salts, like sodium xanthate or barium xanthate, and then acidify it and then neutralize the solution with ammonia, and that gives an ammonium xanthate.

308. Q.—Would you look at D-61 and tell me if you find any reference to ammonium xanthate? A.—Yes. In Exhibit D-61, my
20 Lord, under 2, we find one of the amyl xanthates. The ammonium salt was one of those known at a fairly early date. There is another one, my Lord, under 9; the ammonium salt of ethyl xanthate was known over one hundred years ago. Then there is another interesting one, under No. 14, and it is also under No. 9, where the salt was found from the alkali known as tetra-methyl-ammonium hydroxide. That ammonium radical is NH_4 , and in those two cases the four hydrogens were replaced by four alkyl groups, the methyl radical replaced the four hydrogen atoms in the ion to get tetra-methyl-ammonium xanthate.

309. Q.—Are there any other references that you want to draw
30 attention to, Dr. Purves? A.—I think those references are all I see at the moment. Excuse me, there is one more, under 9, tri-methyl phenyl. In that case the four hydrogens in the ammonium ion have been replaced, three with methyl groups and one with a phenyl group. I could sketch that out if you thought it desirable.

310. Q.—I see that expression tri-methyl phenyl ammonium occurs under 14 too, Dr. Purves, under propyl? A.—Yes, it does. An interesting thing about those substances is that they are very strong bases; as strong as caustic soda.

40 311. Q.—What do you mean by “base”, Dr. Purves? I do not think that is a term we have heard before. A.—A base is something which in reaction with an acid will give a salt, a neutral salt. And those bases are in solution, they are usually soluble in water, and they give a very strongly alkaline reaction to indicators like litmus, and they have a soapy feel like caustic soda solution, like lye, to the

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touch. In fact xanthates can be made if tetra-methyl ammonium hydroxide replaces sodium hydroxide,—you get true xanthate. The difference between the ammonia and the tetra-methyl or tri-methyl phenyl is so great that the substituted ammonium bases are so strong that they give true xanthates.

312. Q.—You spoke of true xanthates. A.—Even though ammonia won't give a xanthate directly, those much more powerful substituted ammonium bases will give xanthates directly.

10 313. Q.—When you use this expression “true xanthate,” are you using it to distinguish from some other kind of xanthate? A.—I think it was a slip. I meant that it gave a xanthate in the sense of E.3.

HIS LORDSHIP: 314. Q.—That might be a wider kind of meaning than Mr. Higgins'? A.—As far as ammonia went?

315. Q.—No, as far as being truly xanthates. A.—I should not have used the word, my Lord. When I said “true xanthates” I really should have said “E-3.” That is what I had in mind rather than some other related compound on the chart.

20 MR. ROBINSON: 316. Q.—Dr. Purves, what is the position of, let us say, ammonium ethyl xanthate shown under No. 9 on D-61 in relation to the formula E-3? Does ammonium xanthate depart from that formula and if so in what respect? A.—No, it does not. It would fall in E-3.

317. Q.—That is what puzzled me, your use of this expression “true xanthate”. A.—That was an unfortunate expression.

318. Q.—That led me to believe that there was some distinction between ammonium xanthate and any other xanthate. A.—No.

HIS LORDSHIP: 319. Q.—In your line E on D-57 you have a note which brings ammonium into the letter M.

30 MR. ROBINSON: I had understood the position to be that way, my Lord, but something that Dr. Purves said in connection with this expression “true xanthate” made me wonder whether he was suggesting there was some distinction between that and other xanthates.

THE WITNESS: It was an unfortunate expression, and I used it because you cannot make ammonium xanthate directly.

HIS LORDSHIP: 320. Q.—You cannot make it directly? A.—No. But if you use a tri-methyl or tetra-methyl ammonium hydroxide, then things go just as usual. That is all that I meant.

40 —The Court recessed for ten minutes.

MR. ROBINSON: 321. Q.—Dr. Purves, I think we can leave the chart for a few moments. Did you give any instructions to Mr. R. L. Bennett in connection with the preparation of cellulose xanthate? A.—Yes, I did.

HIS LORDSHIP: To R. L. Bennett?

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MR. ROBINSON: R. L. Bennett.

322. Q.—On what were those instructions based, Dr. Purves?
 A.—They were based on the detailed instructions for laboratory preparations given in Ott. That is a textbook on cellulose chemistry which is a very good one. It was published last year. I think the page number is 809. Perhaps I might check that. The instructions in Ott differ only in detail from Cross and Bevan's original directions. Ott has got more precision. Cross and Bevan will say "at room temperature." Ott will say, "20 degrees", and so forth, but it is
 10 substantially the same preparation.

323. Q.—What do the letters "CP" mean as applied to chemical substances? A.—That determines the grade, the quality of the chemical. It means "chemically pure" and it usually means that the batch has been analyzed and the impurities present fall below the very low tolerances which have been agreed upon as possible in a chemically pure substance.

324. Q.—In some of the documents that have been produced I find the expression, "alkali salts of ethyl oxydi-thio-carbonic acid." What have you to say as to the relation between compounds so
 20 described and potassium and sodium ethyl xanthates? A.—That is the same thing. That phrase, "ethyl oxy" is the accepted way of noting that the ethyl group is attached to an oxygen atom directly. "Ethyl oxy" would tell us at once it was di-thio-carbonic acid in which ethyl was on the oxygen atom rather than on the sulphur atom. So the word "oxy" really puts the compound into E-3 on exhibit D-57 instead of in one of the other squares.

325. Q.—Dr. Purves, were you responsible for the contents of exhibit D-57 and the notes attached to it? A.—Yes.

326. Q.—Would you look at the notes attached to that exhibit,
 30 on the first page in the line which is indicated C-1; perhaps you might get your chart, too. A.—I will try to find that, too.

327. Q.—I see on that line C-1 and it says "alpha-thio carbamic acid"? A.—Yes.

328. Q.—An unstable substance? A.—Yes.

329. Q.—What was the basis of that statement? A.—These acids in Richter are listed as unstable substances, I think, if they exist.

HIS LORDSHIP: 330. Q.—If they exist they are unstable.

MR. ROBINSON: C-1 is what I had particularly in mind.

40 THE WITNESS: That one is listed in another good book.

HIS LORDSHIP: 331. Q.—If they exist? A.—Yes. There was doubt, I think, in Richter.

332. Q.—Do they exist? A.—Well, C-1 is listed in Mellor. That is a comprehensive textbook on general and inorganic chemistry.

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That is listed in Mellor, volume 6, page 132 as having been isolated as a red oil which is unstable. It is really a small point.

MR. ROBINSON: 333. Q.—Now, Dr. Purves, if you would look on the second page headed, “additional notes”, I would like to draw your attention to the statement in the second sentence of the paragraph which begins, “the compounds in line D” and to the statement, “R may represent any one of many thousands of organic radicals.” What have you to say as to that? A.—The situation, my Lord, is that carbon atoms have got four valencies and they have a great
10 tendency to unite with each other to form those long chains or perhaps branch chains or cyclic things which we describe as carbocyclic compounds. Another name is polycyclic polymethylene. That is using the methylene radical as the building block.

334. Q.—You started out and you said “poly” and then you said “cyclic polymethylene.” Is the term “polycyclic polymethylene”? A.—It is cyclic polymethylene.

335. Q.—I was afraid the reporter might get that in twice in the report. A.—There is an enormous number of permutations and combinations possible so that when we deal with the particular
20 organic compounds it is really a mathematical calculation to get the possibilities. It is like the number of hands which can be dealt out at a bridge game, the number of different hands dealt out at a bridge game if you start with fifty-two cards.

HIS LORDSHIP: 336. Q.—It would be even larger in the case of the possible combinations and permutations? A.—I don't know if it would be larger or smaller but it is the same type of calculation and the same order of magnitude.

MR. ROBINSON: 337. Q.—Have any calculations been made Dr. Purves? A.—They have. There is one article by Henser. Perhaps
30 I can look that up. I must admit I am not enough of a mathematician to understand his mathematics but the result means—

HIS LORDSHIP: 336. Q.—I suppose the number of combinations and permutations that are possible with any given number of things; It can be ascertained by following some formula? A.—That is the point. I do not understand the formula.

MR. ROBINSON: 338. Q.—What conclusion did he come to? A.—The result he came to was if he confined himself to alkyl radicals in the strictest sense of the term, C_nH_{2n+1} that by the time he got up to 19 carbon atoms he got over 17,000 different radicals. I do
40 not think anyone has dared to calculate what the number would be if you took off the restriction and went from the narrow definition of alkyl to a wider one. I don't know what the number would be.

HIS LORDSHIP: 339. Q.—You would have to set a limit on your wider definition? A.—For mathematical purposes you would have to.

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340. Q.—To start with you would have to set a limit? A.—So he set the simplest limit which he could handle mathematically, and it goes up to 17,000. I might mention that over the week-end I remembered stating in that alkyl series they had gone up—

MR. ROBINSON: 341. Q.—When you say “alkyl” what do you mean? A.—In the strictest sense—that they had gone up to about 100 carbon atoms. I have remembered in the last year they have gone up to many hundreds of carbon atoms by a special process so that the 100 limit should be increased. The new compounds are
10 called polyethylenes, and they were on exhibition at the Toronto Chemical Convention last June, but they have many hundreds of carbon atoms in a straight line.

342. Q.—Dr. Purves, looking again at our old friend, exhibit D-57, of what type are the formulae in that? I am not speaking now of assigning chemical names to them, but what types of formulae are they?

HIS LORDSHIP: Which?

MR. ROBINSON: 343. Q.—The formulae in D-57; I am speaking of the way in which they are written? A.—These formulae are
20 called structural formulae because they show in precise detail how the atoms are arranged in the formula.

344. Q.—Now, Dr. Purves, would you look at exhibit P-54. Some of the formulae on exhibit P-54 appear to be written as structural formulae and others in a straight line? A.—Yes.

345. Q.—Take, for instance, the formulae in the left-hand column of exhibit P-54; there are two formulae there, one written in a straight line and the other structural. What, if any, is the difference between them? A.—The difference is that they are really two ways of denoting the same thing. For simple compounds like
30 carbonic acid this line formula is just a shorthand for the structural formula, being just the same thing.

346. Q.—Can you relate the formula given at the bottom of the central section headed “potassium tri-thio-carbonate” to any of the formulae on exhibit D-57? A.—It ought to be there. Potassium tri-thio-carbonate is the potassium salt of B-5 on the chart.

347. Q.—Is it shown itself on the chart? A.—No, it is not shown on the chart.

348. Q.—May I see your copy? I am not sure, but would you look at the chart which was put in evidence. A.—Oh, yes, this is a
40 new edition of that chart.

349. Q.—That is the chart which is in evidence? A.—Here on this chart it is on the chart under E-6, where M on chart E-6 stands for potassium, K, on the plaintiff’s chart.

HIS LORDSHIP: 350. Q.—It is exactly the same? A.—Exactly the same.

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351. Q.—Where “M” stands for “K”? A.—Yes.

352. Q.—Or where the metal referred to is potassium? A.—Yes.

MR. ROBINSON: 353. Q.—How would you write that formula if you wrote it in a straight line, for potassium tri-thio-carbonate? A.—That would be K_2CS_3 .

354. Q.—That is with the two’s written below the line? A.—Yes, just as they are in the plaintiff’s chart.

355. Q.—How about sodium tri-thio carbonate? A.—That would be Na-natrium is the latin name— Na_2CS_3 .

10 356. Q.—Dr. Purves, what have you to say about the inclusion in the chart, exhibit D-57, of compounds which contain chlorine and nitrogen?

HIS LORDSHIP: Or nitrogen?

MR. ROBINSON: Chlorine or nitrogen; I think I said “and nitrogen”, my Lord.

THE WITNESS: I included them because they are closely related to carbonic acid and to thio-carbonic acids. Then the chlorine and nitrogen derivatives of acids are very frequently classified in works of reference and so on, as derivatives of the acids.

20 HIS LORDSHIP: 357. Q.—But they would not be sulphur derivatives? A.—That would depend on whether they were sulphur acids or not.

358. Q.—I mean if they were chlorine or nitrogen substitutions for oxygen they would not be sulphur derivatives? A.—Not unless sulphur was also in the molecule.

359. Q.—Even if sulphur was also substituted for oxygen would you describe them as sulphur derivatives? A.—Yes. That, as a matter of fact —

30 360. Q.—You would describe them as sulphur chlorine derivatives? A.—They can be described accurately as sulphur chlorine or sulphur nitrogen derivatives. It really depends on one’s point of view.

361. Q.—Would they be accurately described as sulphur derivatives? A.—They could be, yes, of carbonic acid. In fact, in some textbooks I think they are almost listed under the same headings.

MR. ROBINSON: 362. Q.—Under the same headings as what? A.—Well, I think one example —

40 363. Q.—I mean speaking generally. You said they were listed under the same headings. What was the heading you had in your mind? A.—Well, for example, everything on this chart is included in Richter’s chapter on derivatives of carbonic acid, and inside that —

HIS LORDSHIP: 364. Q.—But they would all be derivatives of carbonic acid? A.—Yes.

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365. Q.—And the question then is would they be sulphur derivatives of carbonic acid? A.—I see. That, I think, I cannot be too dogmatic on, where you are going to draw the line in that matter.

MR. ROBINSON: 366. Q.—Where you are going to draw the line in what? A.—In just how much you are going to include in that phrase, sulphur derivatives of carbonic acid.

367. Q.—What is your view about what may be included as sulphur derivatives of carbonic acid? A.—Well, I put in those
10 chlorine and nitrogen containing compounds because it is very simply related to the sulphur derivatives of carbonic acid.

368. Q.—Perhaps I can put it this way. How would you define a sulphur derivative of carbonic acid?

HIS LORDSHIP: He has defined them in his chart.

WITNESS: Yes, that is really what it boils down to; that is how I define them.

369. Q.—It is a matter of definition? A.—That is just the point.

370. Q.—And under the wider definition you include in the
20 term sulphur derivatives a number of things which Mr. Higgins does not include? A.—That is just the situation exactly, my Lord.

371. Q.—Mr. Higgins says you should include within the term sulphur derivatives only those derivatives that have sulphur substituted for oxygen? A.—Exactly, yes.

372. Q.—And that if there is a substitution of an oxygen atom by something other than sulphur it is not to be included in the term, sulphur derivative? A.—Yes. When I made this chart my point of view was somewhat different. I looked through the derivatives of carbonic acid, and there we have such important
30 things as phosgene carbonyl chloride. Then we have got an urea which is carbonyl amide, with nitrogen. Those are compounds of great importance. There are many more like them as derivatives of carbonic acid. So what I did was I included the same lot in which oxygen in these derivatives was replaced by sulphur. That was the sort of underlying idea in organizing this chart.

MR. ROBINSON: 373. Q.—Dr. Purves, have you looked at Richter's Organic Chemistry to which Mr. Higgins referred in connection with his discussion of this chart? A.—Yes, I did look at that.

40 374. Q.—Does Richter support the limitations which Mr. Higgins proposes? A.—Well, I think there it is somewhat a matter of opinion. In his general heading of "sulphur derivatives of ordinary carbonic acid" —

375. Q.—Perhaps you had better give the page number? A.—Page 431.

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MR. GOWLING: Could we have the edition as well?

MR. ROBINSON: Yes, I want to get it identified.

THE WITNESS: That is the second revised edition, 1919. It is in the section entitled, "sulphur derivatives of ordinary carbonic acids" that he lists a few of the simpler ones we did not put on the chart and then he lists some of the sulphocarbonic acids, and then just under those in the same section he has got the chlorides of the sulphocarbonic acids. Then he lists three of the compounds we put on the chart.

10 MR. ROBINSON: 376. Q.—What are those compounds, and where would they appear in the chart, that is, the compounds he lists in this chloride subsection? A.—The first one he lists there is D-4. We picked D-4 out of that list, you see.

377. Q.—What is that first compound mentioned in that chloride subsection, the beginning of the section? A.—The first one is not on the chart. That was this compound I happened to mention as thiophosgene.

20 378. Q.—You say that is not on the chart? A.—Oh, yes, it is on the chart. That is C-6, thiophosgene. That is the sulphur analogue of the war gas, phosgene.

379. Q.—Now, you were going to mention some other compounds that were also in that subsection? A.—D-4 is on the chart from the same section of Richter.

379A. Q.—You might identify the compound that you are referring to from Richter? A.—That compound is chloro-carbonthiolic ethyl ester.

30 379B. Q.—Perhaps if these compounds occur in a certain order in Richter it might be simpler from the point of view of the reporter if you simply referred to the first compound, second compound and the third compound. It saves taking down these rather terrific chemical names. A.—Then Richter calls D-11 on the chart chlorothioncarbonic ethyl ester. Then there is another one here which is D-16. It is in that same section of Richter. That is chlorodithiocarbonic ethyl ester.

379C. Q.—You have dealt with the chlorides with relation to Richter, Dr. Purves. What about the amides, that is, the nitrogen containing derivatives?

40 HIS LORDSHIP: 379D. Q.—You have another one in C-5? A.—Yes, C-5 has not been isolated but it is the parent compound of D-11, so that C-5 is really on the chart for the sake of completeness to show the geneology of these compounds which do exist.

379E. Q.—The same would be true of C-2 in relation to D-4? A.—That is right, my Lord, and also C-8.

MR. ROBINSON: 379F. Q.—What about C-8 with relation to D-16? A.—Yes.

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379G. Q.—Now, Dr. Purves, let us turn from the chlorides to the amides. That is the nitrogen containing derivatives. What did you find in Richter? A.—Well, in Richter he has got a separate section on amide derivatives of carbonic acid. As I mentioned they are of considerable importance industrially.

379H. Q.—Do you find in this reference to the amides in Richter —

HIS LORDSHIP: 379I. Q.—Does Richter make it a subheading of sulphur derivatives? A.—Then after that he has got a sub-
10 heading, sulphur containing derivatives of carbamic acid and urea. He has got a separate heading there. He is relating these sulphur nitrogen compounds and he has got a separate section on that. The other thing in Richter was at the very beginning of the chapter on sulphur derivatives of ordinary carbonic acid he first of all lists the whole of our B line. That is just taken straight from Richter. It is also in Mellor's comprehensive textbook on inorganic and general chemistry.

379J. Q.—There is no dispute about the B line? A.—There is no dispute, but then he goes on, "the free acids are not known or
20 are very unstable" —

MR. ROBINSON: 379K. Q.—When you say "free acids" — A.—That is the B list — "but numerous derivatives such as salts, esters and amides are known." So that there you have got amides classified in so many words underneath sulphur derivatives of ordinary carbonic acid, and the amides listed as derivatives.

379M. Q.—Amides are what? A.—Amides are many of the compounds on the chart which contain nitrogen.

379N. Q.—That reference you spoke of is on page what? A.—That is page 431. I am frank to say really that even Richter
30 is not entirely rigorously consistent and it is a matter of convenience, it seems to me, just which way you take that chart. You can argue both ways, to leave a whole lot off or even put some more on. I stopped at an arbitrary point and I could have included a little more.

HIS LORDSHIP: 379O. Q.—You say you stopped at an arbitrary point? A.—Yes.

379P. Q.—You could have kept on going? A.—Yes, but the space on the chart was limited.

379Q. Q.—And relate all sorts of other compositions to a com-
40 position that has some sulphur in it? A.—Yes.

379R. Q.—You would include all of those on the same basis as being sulphur derivatives? A.—Yes, just taking the derivatives of carbonic acid and replacing oxygen by sulphur I could have added some more.

379S. Q.—If you had one of the atoms of oxygen replaced by sulphur you could have other atoms of oxygen replaced by

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atoms of other elements and they would all be sulphur derivatives?
A.—Yes. One example would be phosgene, which is one of the most important derivatives, at least in war time, of carbonic acid. That has got CO in it, and so thiophosgene is CS.

MR. ROBINSON: 379T. Q.—What does “thio” mean in chemical nomenclature? A.—Thio is used to show we are dealing with a sulphur atom which usually replaces an oxygen. Thio alcohol would be SH instead of OH.

379U. Q.—You say you stopped at an arbitrary point on
10 your chart? A.—Yes.

379V. Q.—Where did that arbitrary stop begin? That is, for instance, first of all was there anything that could have been included in the B line and was not? A.—The B line is complete as it stands. One thing which is fairly easy to prepare is to move from carbonic acid, which is technically a meta acid to the ortho acid which has four OH groups. Once you start that several compounds are known in that series but we eliminated them because it really meant we were changing carbonic acid which was under discussion.

20 379W. Q.—Although it would have some relation in the way of name it would no longer be a sulphur derivative of carbonic acid? A.—Not of the meta carbonic acid which we are discussing.

379X. Q.—And carbonic acid alone means meta carbonic? A.—It implies meta so that we just left it.

379Y. Q.—What about the C line? Is there anything that might have been included there and was not? A.—No, I do not think so.

HIS LORDSHIP: 379Z. A.—I suppose you could have had some other element than chlorine or nitrogen? A.—That is quite true.
30 I do not know of any containing salt there.

MR. ROBINSON: 379AA. Q.—You say you do not know of any. Do you mean that you do not know of any that have been made or do you not know of any that are possible? A.—Bromo-phosgene is well known, which is bromine replacing chlorine in phosgene.

379BB. Q.—That is in C-6? A.—That would be C-6.

379CC. Q.—It would be Br. instead of Cl? A.—Yes, if the thio compound were known. The oxygen analogue is well known.

379DD. Q.—And I see you have a note in the second page of the notes to the chart which note says:

40 “It has been considered unnecessary to extend this line of compounds as might have been done to include four additional formulae corresponding to C-2, C-5, C-6 and C-8 in which chlorine was replaced by bromine and four more in which it was replaced by iodine.” A.—Yes, I explained the basis for that.

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379EE. Q.—Subject to that note which is attached to the chart is there any other extension of the C line which could have been made but was not? A.—No, I cannot think of any other simple extension of that line.

HIS LORDSHIP: 379FF. Q.—Could there have been some other substitution than bromine and iodine replacing chlorine? A.—These three are exceedingly similar in their chemical behaviour so that they form a group, chlorine, bromine and iodine.

MR. ROBINSON: 379GG. Q.—I think what his Lordship is
10 wondering is if there could have been other elements that were not either bromine or chlorine or iodine that could have gone in that? A.—No, I could not say, my Lord, as to that.

HIS LORDSHIP: 379HH. Q.—Pardon? A.—I could not say as to that. We can easily replace them with a great many other radicals, of course, of various types but we would move out of the square into another square when we did it.

MR. ROBINSON: 379JJ. Q.—You move out of the C line? A.—We move out of the C line.

379KK. Q.—But I am assuming that you keep staying in the
20 C line and consider the possible extension of that. You have spoken of bromine and iodine. Could you go any further than that? I think that was what his Lordship had in mind when he asked you whether any elements other than bromine and iodine could go in in place of the chlorine. A.—No. That does not occur to me just offhand.

380. Q.—Then the position is, as I understand it, that this arbitrary stopping place that you were speaking of, comes from the D line down? A.—Yes; in general that is the situation.

381. Q.—That is the D line as indicated in the note? A.—Yes.
30 HIS LORDSHIP: That is, if you extend the chart along the lines mentioned in the additional notes.

MR. ROBINSON: Yes. That was the point, my Lord.

HIS LORDSHIP: Then does he say at the end of that the stopping is arbitrary?

MR. ROBINSON: Yes.

382. Q.—If you look at those additional notes to the chart, Dr. Purves, you will be able to follow me. You had those a moment or two ago, I think? A.—Yes. They are not far away.

383. Q.—I have a copy here. I will hand it to you. A.—Yes.
40 I know the notes fairly well.

384. Q.—The notes or the paragraph that I refer to begins “compounds in line D. A.—Yes. I have it.

385. Q.—I see it starts with the sentence, “to this line a number of other compounds could be added but have been omitted for

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simplicity.” That, I understand, is where your arbitrary point comes. A.—In line which?

386. Q.—The paragraph that begins “compounds in line D”?
 A.—Oh, yes.

387. Q.—And it says, “to this line . . .” and so on. A.—Oh, yes.

388. Q.—In discussing Richter, in connection with this chart, you spoke of other authorities. Have you any other authorities on this subject of the inclusion of the chlorine and nitrogen containing
 10 derivatives which you wish to draw our attention to? A.—Yes. In Watts Dictionary of Chemistry he quite systematically lists compounds in which the chloride and amide are listed as derivatives under the corresponding thio-acid.

389.—Q.—The thio-acid would come where on Exhibit D-57, so that we can relate those two terms? A.—That would be in Watt. Those acids are unstable, so he lists the esters. Those would come mostly on the D line.

390. Q.—It is the thio-acids I am speaking about? A.—Yes.

391. Q.—I am just wanting to relate the expression “thio-acids”
 20 to the chart? A.—Oh, yes.

392. Q.—You spoke of thio-acids? A.—Yes.

393. Q.—Where are the thio-acids? A.—The thio-acids on this chart?

394. Q.—Yes, Exhibit 57. A.—They are the B line.

395. Q.—That is all I wanted to make clear.

395. Q.—You were going to refer to Watts, or had you said what you wanted to about Watts? A.—Yes. In Watts Dictionary he will give the ester, for example, ethyl isoamyl thiocarbonate, and then underneath he will give the chloride, and then he will give the
 30 amid, so that there he is putting them all together.

396. Q.—You say the he gives—A.—The ester; and then these derivatives, the chlorides and the amids follow each other.

397. Q.—I think that is all. Thank you very much, Dr. Purves.

CROSS-EXAMINED BY MR. GOWLING:

MR. GOWLING: My Lord, I should like to mark an Exhibit, photostatic copies of the relevant pages of Richter. My learned friend referred to them, and I think perhaps they should be marked as an Exhibit.

HIS LORDSHIP: I think that might be convenient.

40 MR. BIGGAR: My friend is entitled to do that.

MR. GOWLING: We have not the photostatic copies available at the moment.

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MR. BIGGAR: And also Watt.

HIS LORDSHIP: I suppose that would really be the most convenient way, if the parties wish to go to that expense, of dealing with the pages cited.

MR. ROBINSON: There are not a great many.

HIS LORDSHIP: No.

MR. ROBINSON: I do not suppose that all the references that Dr. Purves has spoken of would perhaps amount to over ten pages. That would be just my guess.

10 MR. GOWLING: We will mark that as one of our Exhibits, photostatic copy. It will be P-88.

HIS LORDSHIP: That will be what?

MR. GOWLING: Photostatic copy.

HIS LORDSHIP: Of what?

MR. GOWLING: Photostatic copy of the pages referred to.

MR. BIGGAR: Thirteen pages of Richter.

MR. GOWLING: Yes.

HIS LORDSHIP: What is the title of the book?

20 THE WITNESS: Richter's Organic Chemistry, my Lord. Volume 1. That is the 1919 edition.

HIS LORDSHIP: When you get those made, they can go in as Exhibit P-88.

EXHIBIT P-88: Filed by } Photostatic copy of thirteen
 Mr. Gowling } pages of Richter.

MR. GOWLING: 398. Q.—Dr. Purves, as I understood your testimony yesterday, you stated that benzine is not a carbocyclic compound. Did you state that intentionally? A.—It is not usually. In the broad sense, yes. But those carbocyclic compounds, as a rule, refer to compounds in which we do not have this aryl quality.
30 For example, cyclopolymethylenes would be carbocyclic. The benzine derivatives are usually kept out by themselves because they form the big division between the aliphatic series including carbocyclics and these other ones, including the benzine residue.

HIS LORDSHIP: 399. Q.—That would be the aryl series? A.—Yes.

MR. GOWLING: I understood you to say that the fact is that a carbocyclic compound is a combination of carbon atoms that unite with one another in a ring? A.—Yes.

40 399A. Q.—And on this description there would seem to be no reason why benzine is not a carbocyclic compound? A.—There does not seem to be any reason, except the massive difference in chemical behaviour. I do not usually consider that benzine is classified with other carbocyclic compounds, because that carbocyclic word includes a great deal of territory which is aliphatic rather than aryl.

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399B. Q.—Do you know offhand if Richter classifies benzine as a carbocyclic compound? A.—I am not sure. I have not looked that up.

399C. Q.—But the fact is that you cannot form xanthate from a benzine radical? A.—Yes, that is the point which, to the best of my knowledge has never been done. A xanthate could not be made from a phenolic compound.

HIS LORDSHIP: 400. Q.—Xanthate has never been made from—
A.—From a phenolic compound. That is where the OH is attached
10 to an aryl residue rather than an alkyl one.

MR. GOWLING: 401. Q.—You were asked by my friend to give the meaning of the term “alkaline xanthate”? A.—Yes.

402. Q.—You mentioned that when that question was first asked of you it gave you considerable concern? A.—Yes.

403. Q.—Were you asked that question before you read the specification of the Keller patent? A.—No, I was given the specification. I had that at the time and I was asked: “What does that mean?” And the moment I started to find out specifically what it
20 meant, of course I noticed the contradiction in terms and then started speculating on the various possibilities. That was the situation. Of course what I did was read the whole patent through very carefully and then try and act like Sherlock Holmes, I mean as a sort of guide.

HIS LORDSHIP: 404. Q.—It was not as bad as that, was it? A.—Well, I spent a lot of time studying it and looking up the way in which “alkaline” was used in other portions of the patent and trying to get the whole drift of the patent, under the handicap that I know no flotation at all, nothing about flotation, but with the patent before me and the request of the lawyers for a meaning for “alkaline
30 xanthate” I had great difficulty in coming to any opinion.

405. Q.—You qualify that now, do you, by saying that you know nothing about flotation? A.—No, I don't know that. The first time I witnessed flotation, any experiment, was Mr. Higgins' excellent demonstration a week ago. That was the first time I ever saw a flotation operation.

MR. GOWLING: 406. Q.—It was almost my first time, Dr. Purves—no, I guess it was my second time. I think we agree, Dr. Purves, on most matters on which you have testified, but I would like to have a little more information on some of these points. First
40 of all, would you give me the physical characteristics of cellulose xanthate? A.—Cellulose xanthate in the purest state is a white fibrous material which is soluble in caustic soda.

407. Q.—It is not a crystalline substance? A.—No, it is not a crystalline substance.

HIS LORDSHIP: Q.—It is not a crystalline substance? A.—No, not in the usual sense at all.

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MR. GOWLING: 408. Q.—Is it soluble in water? A.—The pure xanthate—

HIS LORDSHIP: 409. Q.—May I just ask if you said it was a fibre? A.—It is a fibrous material, my Lord; yes.

MR. GOWLING: 410. Q.—Is it also known as viscose? A.—Well, viscose is the word which Cross and Bevan give to the solution of cellulose xanthate in caustic soda, which is the technical intermediate in making regenerated cellulose, as it is called, or rayons. So this acts as the highly viscous solution of the xanthate in caustic soda.

10 411. Q.—And it differs from xanthates made with the alkyl radicals in that a cellulose radical is substituted theoretically for the alkyl radical? A.—Yes, in theory. That is how Cross and Bevan got the idea of starting that viscose industry.

412. Q.—Is the cellulose radical a hydrocarbon? A.—No, it is not.

413. Q.—It is not like ethyl or methyl? A.—No.

414. Q.—Would you call it a carbohydrate? A.—Yes, it is definitely in that class.

415. Q.—It then contains oxygen? A.—Yes.

20 416. Q.—Would this formula be correct for it: $C_6H_{10}O_5$? A.—Yes.

417. Q.—And that would be X times? A.—Yes. That is cellulose itself, not the radical. To get the radical you would have to remove from that formula three OH groups, so the radical would be $C_6H_7O_2$, that would be the radical of cellulose, and still containing the oxygen, and you take it X times.

418. Q.—Did you ever make cellulose xanthate yourself? A.—Yes, I have made that, and been responsible for B.Sc. candidates who have written I think two theses on this subject.

30 419. Q.—Would you explain how it is prepared? A.—In brief, my Lord, it is prepared by replacing the alcohol, or the ethyl alcohol in an ethyl alcohol caustic soda carbon disulphide mixture, replacing the alcohol with fibrous cellulose.

40 420. Q.—Would you explain the actual steps which are taken in the preparation of the cellulose xanthate? A.—Yes. The first step in the preparation of that is to add the caustic soda to the cellulose, which might be derived from wood, wood pulp, or from cotton. And then the caustic soda and the cellulose become intimately mixed and give a swollen gelatinous mass. And after that mass is swollen and is in this gelatinous state it is usually subdivided in shredders, to get it into small particles. And then that mass is treated with carbon disulphide, and the yellow cellulose xanthate forms, and in that stage in the industrial process it is a highly swollen, yellow, somewhat crumbly material. That makes a xanthate. And of course if you want to isolate that xanthate you would stop there

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and work it up by a suitable procedure, for example, washing out the excess alcohol and the excess caustic with methyl alcohol and isolating the xanthate in a pure condition. Technically they take the yellow mass and dissolve it in caustic soda.

421. Q.—It is more complicated than the procedure followed in making, say, a potassium or sodium xanthate? A.—Yes. The extra complication is due to the fact that you have got to start with this fibrous material, which does not give a complete solution in the caustic soda or the carbon disulphide. It stays in a solid phase and
10 swells very rapidly as it sucks them into itself, but it does not actually dissolve; so you are dealing right through with a mixture instead of with a homogeneous solution.

422. Q.—Do you have to take steps to control the temperature of the solution? A.—Yes. That is done in practice, because in the mass production industry they want to come out with a product which is as highly uniform as it can possibly be made. So in the technical process the temperature is controlled very narrowly and all the times are controlled minutely. But of course if one wanted to make an ordinary sample of cellulose xanthate in the laboratory,
20 within quite wide limits, you would get a cellulose xanthate of one degree of substitution or another without being too particular about your conditions.

423. Q.—It is not a product that you can buy readily on the open market, is it? A.—No, the cellulose xanthate is not readily bought.

424. Q.—In other words, it is something that a company wishing to use it would have to give a special order to have it made up at certain times? A.—Yes. The industrial process is that usually they make up the batches of this viscose, which is the xanthate and
30 caustic soda, and then they usually let that xanthate sit in vats. The process is called ripening, and that ripening process may last perhaps three days, perhaps more. Then when it suits their conditions they will take that material and use it for spinning rayon or something like that.

425. Q.—If you attempted to store cellulose xanthate for a few months, what would happen to it? A.—It would decompose unless it was in the pure, dry condition.

426. Q.—It would have to be kept perfectly dry? A.—Yes. In the laboratory it can be kept when it is the dry white solid, which
40 is fairly stable, but when it is mixed up, particularly with water or with alkali, then it slowly decomposes just like any other xanthate does.

427. Q.—You get a brownish liquid from it, is that right? A.—Yes.

HIS LORDSHIP: 428. Q.—You said, in answer to the previous question, just like any other xanthate does. A.—In aqueous solution or in water they all slowly decompose.

For Defendant—Dr. Purves—Cross-Examination

MR. GOWLING: 429. Q.—When you are shipping it you do not actually ship the cellulose xanthate itself, do you? A.—No, that is not done industrially.

430. Q.—In other words, if one wished to obtain cellulose xanthate he would purchase the potash solution or the pulp made with the potash, is that right? A.—Yes. I don't think even that— It could always be kept and shipped for a period of several days, but in industry it is just one big intermediate and it just simply runs through the plant. If you had to ship it you would have to take
10 the crude yellow crumbs, wash them with alcohol and dry them, and then you could ship the material and it would be more stable than it was in solution.

431. Q.—So cellulose xanthate is not a very stable product which you can ship around? A.—It depends upon whether it is prepared for shipping or not.

432. Q.—Just how stable is this product, cellulose xanthate? A.—I do not have quantitative figures that I can supply your Lordship with on the subject of stability.

433. Q.—I really had in mind from a practical standpoint how
20 stable is it in shipping? A.—Well, if it was necessary to buy some of the xanthate the cheapest source would be to ship it as viscose, and in that case you would probably be restricted to perhaps a week before the xanthate started to decompose to the extent of giving you no longer a solution. It might be a week, perhaps two weeks, depending on the conditions.

434. Q.—This dark brown material which appears in the decomposition process is quite a stiff material that can be treated like horn or ebony, is it not? A.—I have heard it described so, but I do not know.

30 435. Q.—You have not made any careful analysis of it yourself? A.—No.

MR. GOWLING: My Lord, I am about to embark on another matter that will take some time.

HIS LORDSHIP: Then this may be a convenient time to adjourn.
—Court adjourned at 12.55. p.m. until 2.30 p.m.

AFTERNOON SESSION
MONDAY, NOVEMBER 20TH, 1944
2.30 P.M.

436. Q.—Dr. Purves, this morning you referred to some instruc-
40 tions that you gave Mr. Bennett. Did you instruct him to make viscose or to make cellulose xanthate? A.—The original instruction there was to make the viscose, any my memory is that from there on I think cellulose xanthate was isolated.

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437. Q.—In other words, viscose had to be made first? A.—Yes, that is the first step.

438. Q.—And the cellulose xanthate from there on? A.—Yes.

439. Q.—Did you give Mr. Bennett written instructions for that purpose? A.—No. That reference was to Ott, that is, the description of making xanthate viscose solution is in Ott, page 809, Chemistry of Cellulose.

440. Q.—Did you tell Mr. Bennett to follow the instructions in that book? A.—Yes.

10 441. Q.—Could you give those instructions from memory? A.—Not in detail, but I gave the general outline of the process just before lunch, describing the steps. I could not trust my memory for exact quantities.

442. Q.—And I do not think you mentioned the time that is taken in the preparation of cellulose xanthate? A.—No. The time in Ott, for example, in the preparation of the alkali xanthate, and then there is an aging process which is used technically to get the right viscosity to work with—in Cross and Bevan that process is described for a day or two, I think; Ott specifies the time at sixty-five hours.

20 There are details of that sort.

443. Q.—The point I have in mind is that making a cellulose xanthate is really a very complicated process as compared with the process of making xanthate from the alkali metals? A.—Well, it depends on what xanthate you make. The complexity comes in because you have got to work with a solid, which originally is immiscible.

444. Q.—Could I confine that to sodium and potassium xanthate by suggesting that sodium and potassium xanthate are very simple to make as compared to making cellulose xanthate? A.—I think it depends on what is meant by that word simplicity. In practice I do not think the difference is enormous, beyond the fact that you have to shred or disintegrate the cellulose mechanically, which you do not have to do with a simple alcohol which is miscible with your other reagents. So from that point of view it is more complicated.

445. Q.—And you have to guard your temperature carefully in making cellulose xanthate? A.—In the laboratory the exact conditions of temperature are within certain limits immaterial. You got out the xanthate that is soluble. But in industry, where you want to get the exact viscosity and reproduce the exact properties for a mass production line, then every detail has got to be standardized in an arbitrary way.

446. Q.—I am told that cellulose xanthate itself is not really a commercial product at all, but the commercial product is viscose? A.—That is the commercial product.

447. Q.—In other words, whereas you might go out and buy viscose, you cannot go out and buy cellulose xanthate? A.—No, I do not think that is a commercial product.

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448. Q.—Would I be correct in suggesting that in discussing xanthates you would regard something like cellulose xanthate as a bit of a freak in that class? A.—I don't think you could call it a freak, because it is simply the application to a large molecule which has got many alcoholic groups of the same process which is known to work well in a simple molecule with one alcoholic group. It goes with starch too, you see, as well as with cellulose; and other carbohydrates of similar composition also will give this reaction.

10 449. Q.—Both the procedure for making it and the resulting product are very different from a xanthate such as potassium xanthate or sodium xanthate? A.—Very different in physical properties, to the extent that one group is composed of big molecules which give you viscid cellulose, and the other one is composed of small molecules. But the xanthate group in cellulose xanthate will have all the characteristic tests and so forth of the xanthate group anywhere else.

450. Q.—In chemistry when you speak of a thing as being soluble, would you say it is soluble in water? A.—The cellulose?

20 451. Q.—No, I am speaking of any material now. When a chemist says that a thing is soluble, without mentioning the liquid in which it is soluble, would it be inferred from the use of the term "soluble" that it is soluble in water? A.—As a general rule I think it would be inferred, but in chemistry you would know at a glance. For example, I might say that alcohol is soluble, and the assumption would be water. But if I said that a hydrocarbon like naphtholene was soluble, people would know instantly it was not water, that I was talking about something else.

30 452. Q.—If you were suggesting that a hydrocarbon was soluble, you would still specify the material in which it would be dissolved? A.—Yes, in which it would be dissolved.

453. Q.—So that when you say simply that a thing is soluble, you would mean soluble in water? A.—Yes, that would be a general implication, but the context would have to be checked in each case.

454. Q.—If you said that a hydrocarbon was soluble, a chemist would know that it is not soluble in water? A.—Yes. It is soluble in organic solvents, that would be the implication there.

455. Q.—Is cellulose xanthate soluble in water? A.—I am not sure at all about that.

456. Q.—You did not try that to see? A.—No.

40 457. Q.—Do you know whether potassium and sodium xanthate are soluble in water? A.—Yes, they are soluble.

458. Q.—And potassium and sodium xanthate will form anions and cations in solution? A.—Yes.

459. Q.—But you could not say about cellulose xanthate? A.—Yes, it would form anions and cations.

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460. Q.—If it is soluble? A.—It if is soluble.

461. Q.—But you do not know that it is soluble? A.—No, but it has most certainly got a certain amount of solubility, because it is soluble in caustic soda, and if you cut down the caustic you cut down the solubility, but I cannot say that is cuts down to zero in distilled water.

462. Q.—I am speaking now of the word "soluble" in its ordinary meaning of soluble in water. You would not say that it is soluble in water? A.—I have got no definite knowledge on that point.
10 The solubility is not very large, I think I could volunteer that information.

463. Q.—Will cellulose xanthate decompose under an electric current? A.—Yes.

464. Q.—And it will yield cellulose at the anode? A.—It sounds reasonable, because I know that some of the simpler xanthates in solution will decompose when you pass an electric current through the solution. I think the xanthate group goes to pieces.

465. Q.—You would expect to find cellulose at the anode? A.—Yes, it would behave essentially as a xanthate group, it has got
20 its individuality running through the whole series.

466. Q.—But if you were to pass an electric current through potassium xanthate you would form dixanthogen at the anode? A.—At the anode?

467. Q.—I think it would be the anode, would it not? A.—Yes.

HIS LORDSHIP: 468. Q.—You would form what? A.—Dixanthogen. Yes, I can form that. I know that that is the behaviour of the xanthate group under certain circumstances, and your cellulose would be in an analogous position.

MR. GOWLING: 469. Q.—In passing this current through, do
30 you know what would be formed at the cathode in both those cases? A.—That would be caustic soda.

470. Q.—Caustic soda? A.—I think that would be it. That is, an oxidation reduction process goes on in that salt, the dixanthogen being the oxidized product of xanthic acid groups. The sodium atoms of two SNa groups drop out and the two sulphur atoms join up SS.

471. Q.—If you treat a solution of sodium or potassium xanthate with, say, acetone or alcohol, can you precipitate the sodium or the potassium xanthate? A.—Some of those xanthates are soluble in solvents such as acetone or alcohol.

40 472. Q.—So that you would not form a precipitate? A.—It would depend on the relative amounts and the solubilities of your particular xanthate whether it stayed in solution or whether part of it separated after.

473. Q.—You would not find a precipitate in just a saturated solution of potassium or sodium xanthate in acetone or alcohol?

For Defendant—Dr. Purves—Cross-Examination

A.—I would have to try that. In some cases acetone is actually used to precipitate out a xanthate salt, and it happens to be insoluble in that medium; but whether that is a general case for all xanthate salts I could not say.

474. Q.—And the same would apply with a saturated aqueous sodium or an ammonium chloride solution? A.—In the case of the sodium chloride you would most certainly precipitate out a lot of the salt by adding acetone or alcohol to the aqueous solution if it was saturated.

10 475. Q.—Would these agents precipitate cellulose xanthate? A.—Yes, they would throw out cellulose xanthate.

476. Q.—Am I correct in saying that a solution of cellulose xanthate and caustic soda will not keep for any substantial length of time? A.—Yes, but the length of time is measured in days, and then perhaps after I think it is something like three days it has gone to the point where it is stable for spinning and is easily coagulated from solution, and then in the course of two weeks it will not even stay in solution. I might say that the time is going to depend a great deal upon the temperature at which your solution happens to remain, 20 that the decomposition will go more rapidly if it is done in warm weather than if it is done in winter—it will make a substantial difference.

477. Q.—Did I understand you to say that you have made ammonium xanthate? A.—No, I have not made it.

478. Q.—You have never made it? A.—No.

479. Q.—Am I correct in saying that both sodium and potassium xanthates are relatively easily made? I think I asked you that before. A.—Yes. You are using “xanthate” as just covering the general field?

30 480. Q.—Yes, any xanthate with an alkyl radical. A.—Yes, they are easily made.

481. Q.—I would like to refer you now to some of the literature on this subject. Before we come to the literature, may I ask you did you ever make lead or copper xanthate? A.—No, I have never made them. They are quite useful salts. I have made copper xanthate, because that is a standard method for analyzing a xanthate.

482. Q.—In making copper xanthate did you first have to make sodium or potassium xanthate? A.—That is the usual way.

483. Q.—And then knock out the sodium or potassium? A.—By 40 adding a soluble copper salt.

484. Q.—Can you say, just generally speaking, if ammonium xanthate is a stable compound? A.—Yes, I think it is.

HIS LORDSHIP: 485. Q.—Then you would make a copper or lead xanthate by following the same kind of process that you would follow in making an ammonium xanthate? A.—Yes.

For Defendant—Dr. Purves—Cross-Examination

486. Q.—You would make a potassium or sodium xanthate first?
A.—Yes, in general.

487. Q.—In each case? A.—Yes. There are certain soluble bases like caustic soda or caustic potash or barium, and it is very easy to make a xanthate. And then those salts are usually used.

MR. GOWLING: Your Lordship used the term “ammonium xanthate” when I think you perhaps meant to say “potassium xanthate” or “sodium xanthate.”

HIS LORDSHIP: No.

10 MR. GOWLING: The witness had told me, I think, that in preparing lead or copper xanthate—

HIS LORDSHIP: 488. Q.—You first make a potassium or sodium xanthate, just as in the case of making an ammonium xanthate you make a potassium or sodium xanthate first? A.—Yes, that is the simplest way.

489. Q.—Can you make a copper xanthate directly? A.—I do not think so. It is not made that way in practice, I can say that.

490. Q.—And you cannot make an ammonium xanthate directly?
A.—No.

20 MR. GOWLING: 491. Q.—I have here a document, which I understand to be written in Spanish.

HIS LORDSHIP: May I just interrupt a moment?

492. Q.—Do you know what effect a cellulose xanthate would have in the presence of a frothing agent in connection with mineral ore? A.—I have no first-hand experience at all on that, I have no knowledge of that field at all, in flotation.

MR. GOWLING: 493. Q.—I am not sure, Dr. Purves, that I can refer you to the literature which you had in mind this morning, but I draw your attention first of all to a document in Spanish,
30 identified as No. 16-2. I am advised that this writer states that it is impossible to prepare ammonium amyl xanthate by the usual processes of making xanthate? A.—I do not know whether it is. I know the author has done a great deal of work on xanthates. I am afraid my Spanish is very rudimentary. I do know that he has got “ammonio,” which I presume is ammonium, in a long list of other xanthates.

494. Q.—Did you read through the documents that you referred to this morning? A.—Which documents are those?

495. Q.—You mentioned the fact that a number of documents
40 disclose methods of preparing ammonium xanthate.

MR. BIGGAR: No, that document was prepared by the next witness, not by this witness, that is Exhibit D-61.

THE WITNESS: Yes, I have that list, I think, showing the way in which ammonium xanthate is prepared.

For Defendant—Dr. Purves—Cross-Examination

MR. GOWLING: 496. Q.—You did not study the publications themselves which are listed on that list? A.—I studied a lot of them, and then I made out an independent list from my own direct research, which was included eventually in the final list of xanthates prepared.

497. Q.—Can you say whether any of the authors indicate that they analyzed the substance that they produced which they called ammonium xanthate? A.—I don't know at all about that.

10 498. Q.—You do not know whether any of the authors of these publications subjected the products they made to any chemical tests? A.—In the vast majority of cases it is almost mandatory before the article is accepted for publication in a reputable journal. Whether it was specifically done on ammonium xanthate, I cannot recall that, except it is listed by at least two authors as having been made.

499. Q.—I know that, but I understand that some of the authors say it cannot be made? A.—Yes, that is also true.

20 499A. Q.—So there seems to be a difference of opinion as to whether it can be made? A.—I do not think there is any difference there. It is a question of the two things. There seems to be, as far as I can find it, agreement that it cannot be made by the direct process and agreement that it can be made by a slightly indirect process. That is the situation as I get it from my own independent study of the literature.

HIS LORDSHIP: That is, you cannot make it without making sodium xanthate or potassium xanthate first? A.—To the best of my knowledge that is the situation.

30 MR. GOWLING: 499B. Q.—But you cannot say whether any of these authors subjected the so-called ammonium xanthate which they made to any tests? A.—Oh, I feel sure that they would do that.

499C. Q.—But of your own knowledge you do not know whether they did or not? A.—No, but the tests are so exceedingly simple, they are just the tests for the xanthate group. The addition of copper would analyze the xanthate group.

499D. Q.—Did you find in any of the references an indication that the products had been tested? A.—Analyzed, do you mean?

499E. Q.—Yes, analyzed. A.—Not that I can quote just at the moment.

40 499F. Q.—I should say in all of these references it is indicated that in making this so-called ammonium xanthate it gives it an aqueous solution which is readily decomposed by boiling it? A.—Yes, I imagine that might be the case.

499G. Q.—It does not give it as a crystalline product in any of the processes in these references? A.—I do not remember its physical properties at all.

For Defendant—Dr. Purves—Cross-Examination

499H. Q.—Do you know anything about the yield which any of these authors obtained from the process, that is the percentage yield from the theoretical? A.—No, I have got no information on that. A good deal would depend on the technique by which they concentrated or removed the water from the initial preparation. If it was done under modern conditions the yield might be high; carelessly done, it might be low.

499I. Q.—I would like to refer you again to the chart D-57.

HIS LORDSHIP: That other document you just referred to is
10 not in?

MR. GOWLING: No, my Lord, it is not in. It is written in Spanish, and I do not know that it would serve any purpose to put it in. I think in view of the evidence given by Dr. Purves there is no object in filing this document. The nature of my questions, as your Lordship will have perceived, was directed generally to ammonium xanthates more than to this particular publication. I was going to deal with a number of them, but in view of Dr. Purves' answers I find that unnecessary. The point is that
20 Dr. Purves indicated he had not analyzed these documents, and I therefore see no reason for pursuing cross-examination on them. It may be that another witness will refer to them and that we will have to file them, but for the moment I see no object in filing this particular document.

MR. BIGGAR: Is that one of the produced documents? I mean, is it one of those pleaded?

MR. GOWLING? It is one in the pleadings.

MR. BIGGAR: It is one of the documents pleaded?

MR. GOWLING: Yes. I thought it was one that Dr. Purves had in mind this morning, but I may have been mistaken. It is on that
30 list that my learned friend filed in Court yesterday of the day before.

HIS LORDSHIP: Oh, yes.

MR. GOWLING: It is on this list. I think the Exhibit No. is D-61.

MR. BIGGAR: That is the one where my friend admitted that those xanthates had been made.

MR. GOWLING: We did not admit the xanthates had been made.

HIS LORDSHIP: No.

MR. BIGGAR: That they were reported to have been made.

MR. GOWLING: We admit the documents say the xanthates
40 had been made.

HIS LORDSHIP: The admission was that there were publications which said that they had been made.

MR. BIGGAR: That is quite right, my Lord, that they were reported to have been made.

For Defendant—Dr. Purves—Cross-Examination

HIS LORDSHIP: Mr. Gowling was very particular to emphasize that there was no admission that they had been made.

MR. BIGGAR: Well, I think for the purpose of a patent case, it does not matter at all which way it is put.

HIS LORDSHIP: That may be.

MR. BIGGAR: That was the reason I overlooked the distinction.

HIS LORDSHIP: That may be. You are not insisting on that document going in?

MR. BIGGAR: We do not ask to have it put in, if nothing turns
10 on it.

MR. GOWLING: Nothing turns on it, my Lord.

500. Q.—Now I should like to refer to this chart, Exhibit D-57. Can you tell me how many of the compounds in line D actually exist? A.—The ones I have checked off, after consulting the literature here are D-2, D-3, D-4. These are formulas, of course, which summarize a large number, theoretically, of the different compounds; and when I say they exist, I have checked at least one representative of each class—sometimes there may be more where R varies.

501. Q.—You do not know how many more would actually
20 exist? A.—No. There are different variations from case to case.

502. Q.—Yes. A.—It is really a guess where I have established that at least one exists. D-2, D-3, D-4.

503. Q.—Could I refer specifically to D-4? Do you know how many of that formula would actually exist? A.—No, I could not say. The numbers vary from 1 up to perhaps 6. The lists are in Richter's Chemistry that we have been using.

504. Q.—Then would you proceed with the others that you found to exist? A.—Then D-6 exists, D-7, D-8, D-9, D-10, D-11, D-12, D-13, D-14, D-15, D-16, D-17, D-18 and D-19.

20 505. Q.—How many of those did you find reported as having been made? A.—All of those; at least one representative of each of those compounds has been made.

506. Q.—And how many of them would be soluble? A.—In water?

507. Q.—Yes, in water. A.—Well, that is a point which I have not considered at all. In general, wherever we have an H in the formula like SH, then the alkali salt would certainly be soluble.

HIS LORDSHIP: 508. Q.—The which? A.—The alkali salt. If the H was sodium or potassium, I would expect those compounds
40 would be soluble in water, where R was a rather small radical. As R got larger and larger, the solubility would drop off.

MR. GOWLING: 509. Q.—I gathered from my learned friend Mr. Biggar, that he was under the impression that thousands of each of these compounds exists, but that does not seem to be the case.

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MR. BIGGAR: No. You misunderstood me. I was following the note attached to Exhibit 57, that except D-1 and D-5, as the note says, my Lord, some product coming within each of the other D's, had existed. The note says: "The symbol R may represent any one of many thousands of organic radicals. Each formula is this line consequently represents a correspondingly large number of possible compounds. Of the compounds represented by the formulae D-1 and D-5 none have, as far as known, ever been made, and of those represented by each of the remaining formulae the number
10 which have been made is a small fraction of the number which might be made if it were considered desirable to prepare them." I did not intend to go beyond that.

MR. GOWLING: That is all right, then.

510. Q.—Dr. Purves, you are not prepared to say how many of that small fraction have actually been made? A.—No; not in quantitative terms.

511. Q.—Could you say how many have been made at all? A.—Well, even that is a guess, because of the compounds that were found listed in Richter and similar books where R would be varied,
20 from methyl to ethyl, butyl to isobutyl and so forth, the number would vary from 1 up to perhaps 6; so that with sixteen types—you have got a minimum of sixteen, and it may run from there up.

512. Q.—Would you agree with this statement by my learned friend Mr. Biggar that if you have even hundreds in the formula D-12, you have fifty times as many hundreds and therefore at the lowest 5,000 included in E-3? A.—Yes. That in general is the situation, because it is a question of permutations and combinations, my Lord. We can vary R within wide limits. There are about fifty metallic elements and groups like ammonium which are known,
30 so that we have fifty times on the combination basis. Those are the possibilities.

513. Q.—You are speaking theoretically again, not practically?

A.—Yes. That is the point. There is a very large number of compounds and of those there is a varying small number so far prepared. It is a matter of the amount of human effort that chemists are prepared to put into developing those variations, and the effort does not appear until it looks as though it is going to be useful.

514. Q.—Could you say how many xanthates have been pre-
40 pared? A.—The list that I have here adds up, I think, to something like ninety; somewhere between ninety and one hundred cases in which—R is different. Then in many of these cases, M in E-3, has been varied. Sometimes through quite a series of metals, with the commoner xanthates; and that would multiply your figure of roughly about ninety at the present time, several fold, to include variations in M.

For Defendant—Dr. Purves—Cross-Examination

515. Q.—Again reading the statement by my learned friend Mr. Biggar, he said: “There are a great many xanthates, of the order we will say, at the very least, of 5,000; and I think we shall give evidence to show that the order is rather of the order of hundreds of thousands than merely thousands.” Would you agree with that statement? A.—Yes, from the theoretical point of view. I think I mentioned that before, that if we even restrict R to the simplest series of alkyl compounds, which mathematicians find that they can deal with, by the time you have got 19 carbon atoms, there are
10 something more than 17,000 possibilities for R; and then if you interchange M half a dozen times, you are up into the five figures, hundred thousands.

516. Q.—And in spite of that number running into hundreds of thousands, you have only been able to find reports of about 90 as ever having been made? A.—90 times the variations in M, which would give you—

517. Q.—No. I am speaking now of what you found as having been reported to have been made? A.—Oh, yes. That is about it; 90 in which R varies.

20 518. Q.—And you made a thorough search of the publications in which xanthates were mentioned? A.—Yes; I have my own file here.

519. Q.—And this list of 90 actually includes the different metals? A.—No. My list of 90 did not take account of the variations in M. That was 90 different variations for R, and that 90 brings us right up to the present date, 1943.

HIS LORDSHIP: 520. Q.—In your 90 you have included the various variations of it? A.—Yes, of R; but not of M.

MR. GOWLING: 521. Q.—I am referring to Exhibit D-61. And
30 this covers, I understand, all the different variations in metals which you have taken into consideration and it still just adds up to about 90? A.—Yes. I think that list, or the date of that list there is only up to 1924.

522. Q.—Yes. That is the date in question in this action. A.—I am sorry. My 90 variations for R went right up to date.

523. Q.—Yes. A.—So that at that time, of course, the list of xanthates, with the variations in R was about at least 14. Since then it has been greatly extended just by the development of chemistry.

40 524. Q.—So that this list—that is, Exhibit D-61—represents the xanthates which were reported to have been made up to, say, 1924 or about that time? A.—Yes. That is as far as our literature research went, at that date.

525. Q.—What are the physical properties of a xanthate; that is, the colour, the odor, when it is pure?

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MR. ROBINSON: I am sorry, but I did not hear the beginning of that question.

MR. GOWLING: 526. Q.—The question was, “what are the physical properties of a xanthate; that is, the colour and the odor, when it is pure? A.—Which xanthate would that be?

527. Q.—Well, xanthate formed with alkali metals, such as sodium or potassium. A.—In general the physical property of a pure xanthate is that it is a very nearly colourless, crystal powder. Sometimes there is a faint yellow to the colour of the pure compound.

10 528. Q.—I understand if it is pure, it is practically odorless? A.—Yes.

529. Q.—You, of course, would call it a compound and not a mixture? A.—It would be a compound if it were pure.

530. Q.—Would you distinguish between “compound” and “mixture”? That is, would you give a definition of the difference? A.—Yes. A mixture is something whose constituent parts can usually be separated by simple physical methods that do not involve chemical reaction. A mixture of sand and sugar can be separated very simply by adding water to the mixture. The sugar dissolves
20 and the sand does not. But procedures of that sort would not separate the atoms from the constituent portions or the radicals from a pure chemical individual compound.

531. Q.—So that a xanthate is a chemical compound? A.—Yes.

532. Q.—Could you call it by the name “alkaline organic sulphide containing a great many complex sulphides?” A.—An alkaline which?

533. Q.—“Alkaline organic sulphide containing a great many complex organic sulphides?” A.—That would not be an accurate description.

30 HIS LORDSHIP: Would be or would not be?

MR. GOWLING: Would not be.

THE WITNESS: That would not be an accurate description.

MR. GOWLING: 534. Q.—Would you say that it contains a great many complex organic sulphides? A.—No. I do not get that. I do not understand the nomenclature just now.

535. Q.—You would not say that is a proper description of a xanthate? A.—No. It depends to some extent—it is not a proper description in any case.

536. Q.—Are the proportions of a xanthate fixed by inflexible
40 chemical laws? A.—You mean the proportions of the atoms to each other?

537. Q.—Yes. That is right. A.—The percentage, do you mean?

538. Q.—Yes. A.—Yes. Once you know the formula of the xanthate, what R is in E-3, and what M is, then you can calculate

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exactly the amount of sulphur in it, the amount of carbon and the amount of sodium and so forth, on a percentage basis, when it is pure.

539. Q.—And by altering the proportions of the ingredients, would you get a different kind of xanthate? A.—Oh, no. The ingredients would form the xanthate in the proportions determined by the formula of the xanthate; and then any lack of balance in the amount used would appear as an excess.

540. Q.—Would you say that the formation of a xanthate is a simple reaction or a complicated reaction? A.—I think, as reactions
10 go, it is quite a simple one.

541. Q.—Are there a great many impurities formed in the reaction? A.—Yes. There are a number of impurities.

542. Q.—I am assuming now that you use the proper proportions and method of preparing xanthate? A.—Yes. Well, when you are dealing with, say, the very best cases, the amounts of impurities found are not very large; perhaps maybe 10 per cent of the total reactant, either caustic soda or carbon disulphide may go off in the form of impurities.

543. Q.—Are any mercaptans formed in the reaction?
20 A.—Those are side reactions which take place; when the reaction stands or is prolonged for a long time, you will get a slight development of mercaptans.

544. Q.—What about alkynes? Are there any alkynes formed in the reaction? A.—I am not sure what alkyne means. It usually means compounds of an acetylenic nature.

545. Q.—Would there be any of those formed in the reaction? A.—Not as a rule; not unless the xanthate decomposes.

546. Q.—What about esters? Are there any esters formed in the reaction? A.—No.

30 HIS LORDSHIP: 547. Q.—You have used that term several times, but so far there has not been any explanation of what it means. A.—Of the word “ester”?

548. Q.—Yes. A.—An ester is a combination of an acid usually, but not always, an organic acid like acetic acid, with an alcohol; or in the case of an ester, you can also get it to react with the carbolic compound phenyl. I could sketch that out for your Lordship if you would be interested.

549. Q.—It is the combination of an acid with what? A.—With an alcohol, with the loss of a molecule of water.

40 550. Q.—With the loss of a molecule of water? A.—Yes. The acid has got the group COOH, and the OH of the acid attaches itself to the H of the hydroxy group, and that forms H₂O; and then the two radicals unite so that the ester group would be CO from the alcohol side and then OC from the acid side.

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MR. GOWLING: 551. Q.—Natural fats are common esters? A.—Yes. They are esters of that glycerol tri-valent radical which we discussed in the morning.

552. Q.—Is the presence of water essential in promoting the reaction and producing xanthate? A.—No, I would say it was not essential at all.

553. Q.—Which of the many organic compounds can be used in preparing xanthate? A.—To prepare xanthate, we first of all have to have carbon disulphide there.

10 554. Q.—That is one absolutely essential ingredient? A.—That is an absolutely essential ingredient. Then we have to have a strong base, which may be caustic soda or caustic potash. Then we can have either a strong base like calcium hydroxide, or barium or strontium, or we can have a strong base derived from ions that are like ammonium or phosphonium.

555. Q.—Are those all organic compounds? A.—The last are organic bases which you could use in a xanthate reaction. And then you have to have alcohol, with alkyl groups, in the broad sense of the word.

20 556. Q.—Which hydro-carbons can be used in forming xanthate? A.—Hydro-carbons is not accurate.

557. Q.—It is an improper term? A.—It is an improper term, yes.

558. Q.—What about the term carbohydrate? Is that an improper term to use? A.—Yes. That brings us into the class of sugars; and there has been quite a wide range of xanthates studied in research by Lieser in Germany, in the period around 1932. He used derivatives of glucose, starch and cellulose. Then there is lichenin.

30 559. Q.—You would not use carbohydrates in producing a xanthate with one of the alkyl radicals? A.—Well, it depends again on the definition of alkyl.

560. Q.—The definition given by Mr. Higgins? A.—Oh, no. They are not alkyls. None of those carbohydrates are alkyls, according to the strict definition. They fall right outside that.

561. Q.—Can you use carbon tetrachloride in producing xanthate? A.—No, you cannot. If you use carbon tetrachloride, you wander off into that ortho-thiocarbonate series which are left off that chart.

40 562. Q.—I understood that you would not use methane nor carbon monoxide either? A.—Methane would be the first member of the hydrocarbons, so it would be inert.

563. Q.—What about carbon monoxide? A.—That would not give a xanthate.

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564. Q.—Do you know of any place that molasses would have in the preparation of xanthate? A.—Well, molasses is a mixture of carbo-hydrates, mostly cane sugar, mixed up with perhaps their own weight of water. So that if you started from that source, your xanthate would be a mixture of xanthates.

566. Q.—In preparing xanthate, what would the effect be if you heated a mixture of caustic alkali with the alcohol and the carbon disulphide? A.—Well, the effect there I do not think would be very considerable. The reaction of xanthation is usually reached and
10 goes along with room temperature. A little heating would not matter because carbon disulphide boils at a low temperature; and if you heat it for a very long time, then you would slowly accumulate more impurities in the mixture.

567. Q.—If you had an excess of caustic alkali, what would the effect be? A.—What was not needed in the xanthate reaction—excess caustic alkali over the carbon disulphide?

568. Q.—Over the amount required in producing xanthate, assuming that you used the correct amount of carbon disulphide? A.—And alcohol?

20 569. Q.—And alcohol? A.—So that the carbon disulphide and carbon are correct?

570. Q.—Yes, they are correct. A.—And the caustic soda is in excess?

571. Q.—Yes. That is it. What would happen if you heated such a mixture? A.—I could not say what exactly would happen.

572. Q.—Would that have a deleterious effect? A.—The xanthate might slowly be decomposed in such a reaction by the hot caustic alkali. But as a rule, they are more stable in alkaline solution than in aqueous solution, so it is hard to say what would happen.

30 573. Q.—What would be the effect if water were present and you heated it? A.—Water is full of OH groups which are very similar to those of alcohol; so that when water is present, both sorts of OH groups are going to compete against each other for the other two reagents, and I would say in general that the presence of water would tend to reduce the yield of xanthate and would tend to increase the yield of other products.

600. Q.—I am informed that an excess of caustic potash would tend the xanthate to decompose even without heat. That is in the production of the xanthate. Would you agree with that? A.—If
40 it were left exposed to the material for a prolonged period I think it would tend to decompose.

601. Q.—For what length of time would you think it necessary to leave it before decomposition would set in? A.—Oh, that would be merely hazarding a guess. My feeling is if you had excess caustic potash in an ordinary xanthate preparation and then you just made

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xanthate and worked it up it would not have a great deal of influence on the yield that you got.

602. Q.—But any decomposition would likely be hastened by heat? A.—If it happened it would be hastened by heat.

603. Q.—And the more you heat it the more decomposition would be hastened? A.—Yes, I think that would be the general rule provided, of course, that your initial reaction is complete. After that heat is no advantage.

604. Q.—Is it a disadvantage after the reaction is complete?
10 A.—I would say—

HIS LORDSHIP: What is that question?

MR. GOWLING: I asked the witness if it would be a disadvantage after the reaction was complete.

THE WITNESS: Yes, I would imagine prolonged heating would be. How serious a disadvantage it would be I cannot say.

605. Q.—I refer you now to chart P-55.

MR. BIGGAR: What is the number you are referring to?

MR. GOWLING: P-55.

606. Q.—You might use this copy, Dr. Purves. I think you
20 are already familiar with this chart? A.—Yes, I was present in court when it was described.

607. Q.—Does that represent the usual method of making xanthate, that is, that you add the ingredients in the order shown in the equation in the lower half of this chart. A.—Yes, that is the usual method. I do not know that it matters a great deal whether you pour one into the other or not.

608. Q.—But you would start with a caustic alkali and add alcohol to the caustic alkali so the caustic alkali would change before
30 pouring in carbon disulphide? A.—Yes, that would be one way of doing it.

609. Q.—Is that not the usual way of doing it? A.—Yes, except that when dealing with this example the whole thing happens perhaps in fifteen seconds. It is just a question of pouring in one and it is not a serious matter from the time point of view.

610. Q.—Then it does not matter much which way you mix it up? A.—No, the whole thing is done in fifteen seconds and it is not going to matter a great deal.

611. Q.—I presume you are familiar with the method of preparing xanthate proposed in paragraph 8 of the patent in suit? A.—Yes.

40 612. Q.—Have you any criticism of the method set out in the patent for the preparation of xanthate? First of all, you might answer that question with respect to the production for laboratory purposes.

HIS LORDSHIP: 613. Q.—May I ask whether caustic alkali would include either caustic soda or caustic potash? A.—The

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words “caustic alkali” would include those two, my Lord, and several others. I have some minor criticisms in detail. I do not know whether they are what you are really asking for or not.

MR. GOWLING: 614. Q.—I am just trying to find out if in your opinion Mr. Keller set forth in his patent a satisfactory way of producing xanthate? A.—Yes, it would give him a good yield. He says 74.7 per cent of crystals. The trouble there is that you do not know exactly whether he weighed in that 20 per cent of moisture or not. It is not a major point.

10 615. Q.—It is not a major point? A.—It would give him xanthate. The other thing which I do not like as a laboratory preparation was that he used denatured alcohol. That means you have got a little methyl alcohol mixed up with your ethyl and your chances are that you may wind up with mostly ethyl xanthate mixed up with a little methyl. Then, of course, I think by and large the less water you have in your alcohol the larger your yield is going to be. That denatured alcohol probably had some water in it, maybe 5 per cent or 10 per cent. He should have used absolute alcohol to get the best yield.

20 616. Q.—Would you regard the small amount of methyl and water as of any consequence in making it in this way, any practical consequence? A.—No. Reading it over it is the sort of preparation which would be made when people were interested in using the cheapest grades of reagents and, if necessary, sacrificing a little yield to make it. I would not give it in this form for preparation by a student. I would prefer them to use a pure caustic and to use absolute ethanol. I would most certainly tell him to make it clear whether his 74 per cent yield was 20 per cent moisture or whether it was not.

30 617. Q.—Would you say this was a method which could be applied to commercial production? A.—Oh yes, I think so; if the scale were increased it would probably work.

HIS LORDSHIP: 618. Q.—It could be applied to commercial production simply by increasing the scale? A.—Increasing the scale and then watching for costs, sacrificing yield of xanthate to purity and expense of reagents. That would have to be balanced up to find out whether it was economically worth while.

40 MR. GOWLING: 619. Q.—I am now referring to exhibit K-30. That is a letter identified as plaintiff's production No. 150 which was filed on the examination of Mr. Keller. In the last paragraph of this letter there is a description of a method of preparing xanthate. Would you mind reading that, Dr. Purves? If my memory serves me correctly it is just about the fifth line in the last paragraph. Just read that method there and tell me if that agrees substantially with the method set forth in the patent? A.—I am not very clear just what happened to this —

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HIS LORDSHIP: 620. Q.—Pardon? A.—I am not very clear as to what happened in this preparation.

MR. GOWLING: 621. Q.—That is, you do not think the description in the letter is clear? A.—Well, caustic soda and alcohol are soluble. The caustic soda would dissolve in the alcohol to a limited extent. Then he talks about the aqueous phase so I must infer his alcohol was not 100 per cent.

622. Q.—There was some water present? A.—Yes, so that I imagine what happened was he got as the bottom phase or bottom
10 layer a concentrated solution of caustic soda in dilute alcohol and then the top phase might be caustic soda dissolved in stronger alcohol and he rejected the aqueous phase and used the top layer.

623. Q.—The dilution of the alcohol would be with water. Do I understand you correctly? A.—I think the alcohol that he started with cannot have been high grade alcohol.

MR. BIGGAR: I think you are at cross purposes. You directed his attention to the last five lines of the letter and the witness is directing himself to something else.

HIS LORDSHIP: Your question was directed to the last five
20 lines.

THE WITNESS: I am sorry, my Lord.

MR. GOWLING: I intended to suggest that he start five lines down in the last paragraph, "if my memory serves me right."

MR. BIGGAR: That method is fully described in another letter.

MR. GOWLING: 624. Q.—My point, Dr. Purves, is whether or not the method described in this letter corresponds for practical purposes with the method set forth in the patent? A.—Well, the difficulty there is that the caustic soda or alkali would dissolve in an excess of alcohol.

MR. BIGGAR: There is a misunderstanding because the witness
30 is directing himself now to the last five lines and you are directing him to the method which is in the middle of the last paragraph.

MR. GOWLING: Are there two methods described in the last paragraph?

MR. BIGGAR: There are two methods described in the last paragraph, one Mr. Nutter's and one the laboratory.

MR. GOWLING: 625. Q.—Are there two methods described in that last paragraph, Dr. Purves? A.—Yes.

HIS LORDSHIP: Yes, there are two methods. One is Rosen-
40 stein's, is it?

MR. BIGGAR: No. If your Lordship will forgive me there are three methods referred to.

HIS LORDSHIP: There are three methods referred to.

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MR. BIGGAR: The Rosenstein method is referred to, the Nutter method is described a little and then in the last five lines a method employed by the Keller laboratory is described a little.

MR. GOWLING: I think I made it clear that the method to which I am referring is the one starting, "if my memory serves me correctly." I am sorry if I misled Dr. Purves into the last five lines because I said to start about five lines down with that description.

10 HIS LORDSHIP: "If my memory serves me" — that would be in reference to the method that had been suggested by Mr. Nutter, I suppose?

MR. GOWLING: That is right, my Lord.

HIS LORDSHIP: Then he speaks of the method employed by himself.

MR. GOWLING: What I am endeavouring to ascertain from Dr. Purves is whether there is any chemical difference between the method set forth in the passage I have referred to in the letter and that set forth in the patent. I am only concerned with the one in the letter and the method in the patent.

20 THE WITNESS: That is, "if my memory serves me right"—that method as against the patent?

MR. GOWLING: 626. Q.—Yes? A.—It seems to me that is going to give substantially the same result. The only thing is that he is using an alkali to try and get more water out of the alcohol. In other words, he is trying to dry his alcohol a little bit before he puts it through the xanthate preparation. That is what he is out to do.

627. Q.—So that for practical purposes they are the same? A.—He is going to get a yield of xanthate out of that.

30 HIS LORDSHIP: 628. Q.—That does not quite answer the question which was put to you which was that for practical purposes it is the same and your reply was, "he is going to get a yield of xanthate out of that." It might be a small yield or a large one. A.—Yes, there is that. My difficulty is that I cannot guess at the amount of water that he has got in the two preparations. It seems to me this is basically simply a device for using an inexpensive grade of alcohol instead of the difficult and more expensive absolute alcohol.

40 629. Q.—Would there be much difference in the yield of the xanthate? A.—I do not think there would be a great deal. If it was done with absolute 100 per cent ethanol the yield of xanthate would be very high. Then I notice here by using a technical grade of alcohol containing some water he is still getting a yield of apparently 74.7 per cent so that the water is not very critical in that range, you see. My only data in comparing these two is that

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I think he is probably going to get out a somewhat similar yield in this latter preparation but I cannot be specific because I do not know how much water he actually did leave in and how much he had to start with.

MR. GOWLING: 630. Q.—I am mainly concerned with whether or not there is any chemical difference, and I gather from your answers there is no chemical difference? A.—No, I do not think there is any chemical difference.

HIS LORDSHIP: 631. Q.—One method may yield more xanthate
10 than another but it would cost more? A.—Exactly; that is the thing in a nutshell, my Lord. I had not seen this letter before but it seems to be a perfectly legitimate and typical effort to get out something they want in the cheapest possible way. Then, of course, they sacrifice yield to cheapness of raw materials and then they have to strike a balance to find out what the possibilities are.

MR. GOWLING: 632. Q.—This looks like a company trying to produce it and make a profit, in other words? A.—Well, it has all the earmarks of those considerations, the paragraph I have read in this letter.

20 633. Q.—I understand that the metals potassium and sodium both fall within the group called alkali metals? A.—Yes.

634. Q.—And are there five or six metals in that group? A.—There is potassium, sodium, lithium, rubidium, caesium. That would make five.

635. Q.—I understand that potassium and sodium have many similar characteristics? A.—Yes, they are very similar.

636. Q.—For instance, they appear next to each other in what chemists call the periodic scale? A.—Yes.

30 637. Q.—Would you say they both react the same in almost all chemical reactions in which they might be involved? A.—Yes, I think that is the case. In fact, the five are classified all together as alkali metals because they have this similarity.

638. Q.—So that for practical purposes we could say they are equivalents? A.—Yes.

MR. BIGGAR: What practical purposes?

MR. GOWLING: 639. Q.—Let us say in the production of xanthate are they equivalent? A.—Potassium salts are very expensive in comparison to sodium.

40 640. Q.—But the xanthate produced by both would likely be very similar? A.—I would imagine it would be very similar.

641. Q.—And you think that the sodium might be produced somewhat cheaper because the metal is cheaper? A.—Yes.

642. Q.—In producing xanthate sodium and potassium would both react the same, that is, in the actual production of xanthate it is immaterial whether you use potassium or sodium in so far as

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the chemical reaction is concerned? A.—Yes. One has to adjust the quantities used as they were indicated on your exhibit. That would be exhibit No. P-55. There would have to be an adjustment of weights.

643. Q.—Would you expect potassium xanthate and sodium xanthate to react similarly in any chemical reaction in which they are involved? A.—Yes, by and large I would.

644. Q.—Would there be any substantial difference between the reaction of potassium xanthate with, say, sodium amyl
10 xanthate? A.—Not as far as the xanthate group is concerned.

645. Q.—They are both within the same general group? A.—Yes. In fact, those two are within the $C_n H_{2n+1}$ group.

MR. GOWLING: If you will pardon the slight delay, my Lord, it is a little difficult, as your Lordship appreciates, to cross-examine an expert such as Dr. Purves, particularly when we agree with most of what he has said.

646. Q.—Dr. Purves, in describing the production of xanthate Keller sets out in his patent that he first secures xanthate crystals by centrifuging the material. Would I be correct in assuming that in
20 the centrifuging process any impurities would likely be thrown off with the mother liquor? A.—A lot of them would, but that 20 per cent moisture which he says the centrifuging yielded — that is in line 95 of the patent, my Lord, — that, of course, is not moisture. It is mother liquor.

HIS LORDSHIP: 647. Q.—So there would be some impurities in that 20 per cent? A.—Exactly; that would be representative of the mother liquor with the impurities which were met in the process.

MR. GOWLING: 648. Q.—But you would expect that the centrifuged crystals would be somewhat purer than xanthate crys-
30 tals recovered by the evaporation of the mother liquor? A.—Oh, yes, when the mother liquor was evaporated and all the impurities—

HIS LORDSHIP: 649. Q.—All the impurities would remain? A.—Mixed up with that xanthate it remained dissolved.

MR. GOWLING: Thank you, Dr. Purves, that is all.

HIS LORDSHIP: 650. Q.—What is the substance in paragraph 7, “that this eventually yielded a yellow or orange salt”? A.—That substance I think is a mixture of inorganic salts containing sulphur, and the one present in greater amount would probably be sodium tri-thio-carbonate. It is on the chart.

40 MR. GOWLING: 651. Q.—May I suggest to the witness it would be potassium tri-thio-carbonate? A.—I am sorry; caustic potash was used so it is potassium tri-thio-carbonate.

HIS LORDSHIP: What would that substance be on the chart, exhibit P-54?

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MR. GOWLING: It is marked on the chart as potassium tri-thio-carbonate.

HIS LORDSHIP: 652. Q.—Potassium tri-thio-carbonate? A.—Yes, in the bottom right-hand corner.

MR. GOWLING: Perhaps I could clear up the mistake, by Lord, by suggesting that potassium tri-thio-carbonate was another of the sulphur derivatives of carbonic acid referred to in the patent.

HIS LORDSHIP: Yes.

MR. GOWLING: It was another of the sulphur derivatives but
10 not a xanthate itself.

HIS LORDSHIP: One of the essential distinctions is there is no alkyl radical.

MR. GOWLING: 653. Q.—That is right, is it not? A.—Yes, that is the essential distinction together with the fact it is three sulphur atoms whereas xanthate has two:

HIS LORDSHIP: 654. Q.—It is three sulphur atoms whereas xanthate has only two? A.—Yes.

655. Q.—And the potassium xanthate has only one potassium atom? A.—Yes.

20 656. Q.—And an alkyl radical? A.—Yes, replacing the other potassium.

657. Q.—Replacing the other potassium atom? A.—Yes.

MR. GOWLING: 658. Q.—In other words, OC_2H_5 in potassium xanthate is replaced by sulphur and potassium atom in the potassium tri-thio-carbonate? A.—Yes.

MR. GOWLING: Does that clarify the point your Lordship had in mind?

HIS LORDSHIP: 659. Q.—Then, would the substance prepared in accordance with paragraph 8 be a derivative of the substance
30 referred to in paragraph 7? A.—I do not think it is usually regarded in that light because I know of no easy or simple way in which one could be converted into the other. They are both derivatives of carbonic acid.

660. Q.—They are both sulphur derivatives? A.—Yes, sulphur derivatives.

MR. GOWLING: 661. Q.—As I understand it you obtain potassium xanthate through di-thio-carbonic acid and you obtain potassium tri-thio-carbonate through tri-thio-carbonic acid? A.—Exactly.

662. Q.—You read down each line? A.—Yes.

40 HIS LORDSHIP: You read down each line. We will adjourn now until 10.30 tomorrow morning.

—Court adjourned at 4 o'clock p.m. to meet Tuesday, November 21st at 10.30 o'clock a.m.