

CANADA
PROVINCE OF
QUEBEC
MONTREAL

Court of King's Bench
(APPEAL SIDE)

8

On appeal from a judgment of the Superior Court, in the District of Montreal,
rendered by the Honourable Mr Justice Albert DeLorimier on the
28th day of June, 1933.

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GATINEAU POWER COMPANY,

a body politic and corporate, duly incorporated, having its head
office and principal place of business at the City and District
of Montreal,

(Defendant in the Superior Court),

APPELLANT,

—AND—

FREEMAN T. CROSS,

of the Village of Farm Point, in the Province of Quebec,
Lumber Merchant,

(Plaintiff in the Superior Court),

RESPONDENT.

THE CASE

VOLUME 8

PLAINTIFF'S EVIDENCE IN REBUTTAL (1st Hearing)
AND DEFENDANT'S EVIDENCE IN
SUR-REBUTTAL (1st Hearing)

UNIVERSITY OF LONDON
W.C.L.
-6 JUL 1953
INSTITUTE OF FINANCE
LEGAL STUDIES

BROWN, MONTGOMERY & McMICHAEL
Attorneys for Appellant

MacDOUGALL, MacFARLANE & BARCLAY
Attorneys for Respondent

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25, RUSSELL SQUARE,

LONDON,

W.C.1.

**PLAINTIFF'S EVIDENCE
IN REBUTTAL**

In the
Superior Court

No. 45.
Plaintiff's
Evidence.
In Rebuttal
G. J. Papineau,
Examination
Nov. 13th, 1931.

L'an mil neuf cent trente et un, le treizième jour de novembre,
Est comparu :

GUSTAVE JOSEPH PAPINEAU,

ingénieur civil et arpenteur géomètre, témoin déjà entendu de la part
du demandeur et rappelé en contre-preuve ;

Lequel, sous le serment qu'il a déjà prêté dépose et dit :

10 INTERROGE PAR Me LOUIS S. ST-LAURENT, c.r.,
CONSEIL POUR LE DEMANDEUR :

Q.—Monsieur Papineau, vous êtes arpenteur géomètre et vous
avez déjà été entendu comme témoin en cette cause ?

R.—Oui.

Q.—Nous vous avons montré le plan de M. Farley qui a été
produit en la cause comme pièce D-69 ?

R.—Oui.

20 Q.—Sur ce plan D-69, le lot indiqué C. I. P. Co. ex-Flynn y
est indiqué comme partie du lot 21-D, n'est-ce pas ?

R.—Oui.

Q.—Alors que dans le contrat de vente qui a été produit comme
pièce D-15 il était indiqué comme 20-C, mais comme devant être
21-C ?

R.—Oui.

Q.—Si le lot Flynn faisait réellement partie de 21-C, jusqu'où
viendrait sur le rivage le lot 21-C ?

30 R.—La ligne sud-ouest prolongée au bord de la rivière laisse-
rait un espace d'environ dix (10) pieds, dix (10) à douze (12) pieds,
entre cette ligne prolongée et la ligne entre les lots originaires 20 et
21 du 15ème rang.

Q.—Avez-vous préparé un plan qui ferait voir où se trouverait
cette intersection, si le lot Flynn doit être considéré comme partie
du lot 21-C ?

R.—J'ai préparé un plan qui est une copie, pratiquement une
copie du plan P-19, et j'ai prolongé la ligne sud-ouest du lot Flynn
jusqu'au bord de la rivière. Cette ligne prolongée est indiquée par
les points G et H sur cet exhibit.

40 Q.—Voulez-vous produire ce plan comme pièce P-61 ?

R.—Oui.

Q.—Ce plan paraît être fait à la même échelle que D-69 ?

R.—Oui. Une échelle de cent pieds au pouce, qui est la même
que l'exhibit D-69.

Q.—Et le lot Flynn est-il, sur votre pièce P-61, indiqué comme
étant à la même place relativement aux autres choses, qu'il l'est sur
D-69 ?

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(continued)

(Le témoin prend des mesures sur les deux plans en question).

R.—Oui.

Q.—La seule différence, c'est que vous avez prolongé la ligne qui part du point H, se dirigeant vers le point G, jusqu'à l'intersection avec la rive?

R.—Oui.

10 Q.—Et vous avez mis sur le lot Flynn " 21-C ", alors que sur le plan D-69 le lot Flynn est indiqué comme faisant partie de 21-D?

R.—Oui. D'après l'Exhibit D-15.

Q.—Les autres indications sont les mêmes que vous aviez sur l'autre plan que vous avez produit lorsque vous avez été entendu en chef?

R.—Oui. Et, en plus, les lignes de contour sur la moitié nord du lot 21, sur la propriété de Cave.

Q.—Vous avez indiqué la ligne de contour 318 sur le lot. . . .

R.—21-A.

20 Q.—. . . . 21-A, qui se trouvait la propriété Cave?

R.—Oui. Ce contour a été extrait de la pièce D-10.

Q.—La pièce D-10 qui est l'un des plans déposés par la compagnie défenderesse?

R.—Oui.

Q.—Vous avez coloré en rose toute cette partie du lit de la rivière qui se trouverait incluse dans le prolongement des lignes rectangulaires de l'ancien lot 21?

R.—Oui. Ainsi que le terrain compris entre le chemin de fer et la rivière Gatineau.

30 Q.—Maintenant, je vois qu'il y a une ligne qui paraît séparer les lots 20 et 21, ou du moins, une ligne traversant la rivière, portant au-dessus " lot 20 ", et, en dessous, " lot 21 " ?

R.—Cette ligne a ses extrémités marquées par les lettres A et L-2.

Q.—Je comprends que c'est, sur la terre ferme, les lignes latérales du lot 21, et dans le lit de la rivière, le prolongement de ces lignes latérales?

R.—Oui.

40 Q.—Quelle est cette ligne qui fait un angle avec celle dont je viens de vous parler et qui se trouve très rapprochée de celle dont je viens de vous parler?

R.—C'est une ligne d'arpentage tracée sur la glace et où j'ai pris des sondages du fond de la rivière.

Q.—Vous l'avez fait apparaître sur le plan, mais ce n'est pas une ligne qui existe sur le terrain du tout?

R.—La ligne marquée Alpha, E n'existe pas sur le terrain.

Q.—C'est simplement l'indication sur votre plan d'une ligne

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Cross-examination

suisant laquelle vous avez pris les différents chaînages qui sont écrits vis-à-vis?

R.—Oui,—Sondages.

Q.—Les différents sondages qui sont écrits vis-à-vis?

R.—Oui.

CONTRE-INTERROGE

PAR Me CASIMIR DESSAULLES, c.r.,
CONSEIL POUR LA DEFENDERESSE:

10

Q.—Cette nouvelle figure du lot 21-C n'apparaît pas sur le plan que vous avez déjà produit?

PAR LA COUR:

A quel exhibit réferez-vous?

Me Dessaulles, c.r.: L'exhibit P-20.

20 PAR Me DESAULLES, c.r.:

Q.—Sur l'exhibit P-20 il n'y a pas d'indication de numéro? où est-ce qu'il n'apparaît pas que c'est une partie du lot 21-D?

R.—Il n'apparaît pas de numéro de lot sur la partie appartenant à Flynn.

Q.—Votre plan P-20 avait-il été préparé par vous après les recherches que vous aviez faites au bureau d'enregistrement par rapport à ce lot-là?

30 R.—Non. C'est une copie du plan d'expropriation de Farley, sauf vérification, pour la ligne sud-ouest de la propriété Flynn, que j'ai rattachée à mon arpentage sur les lieux.

Q.—Avez-vous fait un arpentage quant à la propriété Flynn?

R.—Non, sauf le relevé sur le terrain de la ligne sud-ouest de la propriété Flynn.

Q.—La ligne sud-ouest de la propriété Flynn, c'est marqué H-G sur votre plan P-61?

R.—La propriété Flynn n'occupe qu'une partie de la ligne G-H.

40 Q.—Alors, quelle est la partie de la ligne G-H que vous aviez relevée sur le terrain?

R.—L'intersection de cette ligne avec la clôture du chemin de fer, et l'intersection de cette ligne avec la route, le chemin public.

Q.—Marquez donc le point d'intersection avec le chemin de fer.

R.—Je vais marquer Z et Z-1 la partie que j'ai relevée sur le terrain.

Q.—Alors, sur quoi vous basez-vous pour ce prolongement de la ligne entre Z et G?

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R.—Sur le plan cadastral.

Q.—Voulez-vous regarder le plan cadastral et m'indiquer où vous trouvez cette ligne Z-G?

R.—C'est la ligne nord-ouest du lot 21-D.

Q.—Pourriez-vous regarder le plan cadastral et me la montrer?

(Le témoin examine le plan cadastral et indique une ligne à l'avocat).

10 Q.—Maintenant, sur le plan cadastral, cette ligne se trouve, en fait, vis-à-vis le lot 21-D et non pas vis-à-vis le lot 21-C?

R.—C'est la limite entre le 21-C et le 21-D.

Q.—Mais dans votre plan P-61, vous déplacez cette limite de manière à inclure la partie Flynn dans le lot 21-C, au lieu de la laisser dans le lot 21-D?

R.—Non. L'exhibit D-15 est ma seule source pour placer l'indication 21-C au nord de la ligne G-H.

20 Q.—Où trouvez-vous une indication qui puisse vous permettre, sur le plan du cadastre, P-14, de placer le numéro 21-C sur la propriété Flynn?

R.—Non. L'idée est que sur le plan du cadastre la ligne 21-D est indiquée sensiblement droite, ou est indiquée droite en tant qu'on peut le constater sur le plan. Me basant sur l'exhibit D-15 qui me dit que la propriété Flynn est du 21-C, j'ai prolongé cette ligne en ligne droite, tel qu'indiqué sur le cadastre.

Q.—Savez-vous quel est l'auteur de Flynn?

R.—Non.

Q.—Ce n'est pas un nommé Reid?

30 R.—Je ne le sais pas.

Q.—Ce n'est pas Thomas Reid?

R.—Je ne le sais pas.

Q.—Voulez-vous prendre connaissance de la pièce P-25, qui est le plan du Pacifique, et dire si vous trouvez l'indication que le lot Reid correspond au lot Flynn?

R.—Sur le plan en question, je ne vois pas le numéro de cadastre. Le seul numéro de cadastre montré, est 21-C.

Q.—Mais vous savez que 21-C ne s'étend pas jusqu'à la limite entre 14 et 15? Ou s'étend-t-il jusqu'à la limite?

40 R.—Quels lots 14 et 15?

Q.—Entre les rangs 14 et 15?

R.—Ah oui, le 21-C s'étend jusqu'aux rangs 14 et 15.

Q.—Si on prenait pour acquit, que, suivant la théorie de la division du lit de la rivière, illustrée par le plan D-69, la compagnie du Pacifique avait des droits riverains jusqu'au milieu de la rivière, comment diviseriez-vous le lit de la rivière, d'après votre théorie à vous?

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Me Louis S. St-Laurent, c.r., Conseil pour le demandeur, s'oppose à la question comme ne découlant pas de l'interrogatoire principal.

L'objection est maintenue par la Cour.

Q.—Vous avez dit, nest-ce pas, que vous aviez coloré en rose la partie du lit de la rivière qui se trouvait vis-à-vis la propriété du Pacifique?

10

Me St-Laurent, c.r.: Je ne pense pas que le témoin ait dit cela, monsieur Dessaulles.

Me Dessaulles, c.r.: Je crois que oui.

PAR Me DESSAULLES, c.r.:

Q.—Avez-vous référé ou non à la propriété du Pacifique dans votre déposition? J'ai compris cela.

20

R.—J'ai coloré en rose à partir de la voie du Canadien Pacifique.

Q.—Si vous preniez le plan D-69, comment arriveriez-vous à attribuer le lit de la rivière à M. Cross? Ou, de quelle façon diviseriez-vous le lit de la rivière?

Même objection que ci-dessus de la part de Me St-Laurent, c.r., Conseil pour le demandeur.

L'objection est maintenue par la Cour.

30

Et le témoin ne dit rien de plus.

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Examination
Jan. 11th, 1932.

On this eleventh day of January, in the year of our Lord one thousand nine hundred and thirty-two, personally came and appeared

DE GASPE BEAUBIEN,

40 of the City of Montreal, Consulting Engineer, aged fifty years, a witness produced on behalf of the plaintiff in rebuttal, who, being duly sworn, doth depose and say as follows:

EXAMINED BY MR. ST. LAURENT, K.C.,
OF COUNSEL FOR PLAINTIFF:

Q.—Mr. Beaubien, although your language and mine is French, for the purpose of dealing with the evidence given by Mr. Scovil and

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other engineers, we have thought it might be more convenient if you would testify in English, and you have expressed your willingness to do so?

A.—Yes.

Q.—What is your occupation?

A.—Consulting Engineer.

Q.—What are your professional qualifications?

10 A.—I am a graduate of McGill University. I worked in engineering work before I graduated with the Montreal Light, Heat and Power Company, the Shawinigan Water and Power Company, and since graduation with the Westinghouse Electric and Manufacturing Company, in Pittsburgh, and as Consulting Engineer in Montreal since 1908.

I have done electrical work, but since that time I have done more hydraulic works than electrical.

20 I am a member of the Electric Service Commission of the City of Montreal, which is not hydraulic, but which is in charge of putting wires underground in the city, and I have been doing this work for the last twelve years.

I am a member of all the engineering bodies; the Corporation of Professional Engineers, and the Engineering Institute of Canada, and of the Association of Consulting Engineers.

30 In hydraulic work I had the opportunity of working on the hydraulic jump, that is, a hydraulic device, in order to decrease the tail water elevation on a power plant, which is rather a hydraulic problem, and since it was one involving important matters, I had my figures confirmed by Mr. R. A. Johnson, of New York, who is the inventor of the Johnson Valve and Surge Tank and Pump Test, and I might say he found everything absolutely correct.

I have designed differential surge tanks, and, of course, worked backwater curves, and in one instance, for the Montreal Cotton Company, in Valleyfield, where we had to excavate the tail-race in order to get more head in the plant, which was a work which lasted three years on a drop where we managed to get a gain of two and a half feet, which represented a very substantial amount for the Montreal Cotton Company.

Q.—Just what is meant by backwater curve?

40 A.—If you put an obstruction in the river that stops the flow of the current, that will raise the water behind the obstruction, and it will go up the river to a certain point where it gradually disappears and what we have to work out is to find out actually where that point is.

Q.—Are there hydraulic formulas according to which those curves can be worked out after a certain number of observations have been secured?

A.—Of course, that is a problem that presents itself in almost

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every hydraulic development, and it has been solved and treated in so many ways and so different for so long, that we have arrived at methods which are fairly reliable and allows us to predetermine within reasonable limits what is going to happen in the river.

Q.—Was it in using these methods that you did this work which you have referred to a moment ago, and which was checked by Mr. Johnson?

A.—No. That was a very special hydraulic problem which does not come in under that sphere at all. It is a very unusual hydraulic
10 problem and unusually difficult.

Q.—Had it also to do with the problem of getting away a certain volume of water?

A.—It had to do with allowing excess water which was of no use in spring floods to be used to lower the tail elevation of the plant where the water of the turbines came out.

Q.—Then, in this case of the Montreal Cotton Company, where I understand you to say there was a gain obtained of some two and a half feet in head, what kind of calculation did that involve?

A.—That was purely a backwater curve. The problem there was
20 to excavate with as little capital expenditure as possible, or at such parts as would entail as little capital expenditure as possible, in order to gain a maximum head for the Montreal Cotton Power Plant.

Q.—Was that something that could be done by merely going out and looking at the scene?

A.—No.

Q.—Did it involve the taking of calculations from observations?

A.—It involved the taking of observations for some time, and it involved the starting of the work and valuing with constant re-
30 checking and working for some two or three years, of three years' duration.

Q.—I understand you were present in Court during the greater part of this trial which has taken place?

A.—Yes.

Q.—And you were here especially when Mr. Scovil and Mr. Simpson were heard?

A.—Yes.

Q.—And you heard their evidence as to the effect of this back-
40 water curve on the Pagan Water Power which would result from obstructions placed at certain elevations at Cascades?

A.—Yes, I did.

Q.—Have you studied the exhibits filed in that connection and the data spoken about by these witnesses?

A.—I have, and I have studied a great deal more data than was supplied to me by Mr. MacRostie from the Department in Ottawa and from first hand observation of the river, and I have gone into that very fully, because the question as to what the effect might be

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in the development at Cascades on Paugan is the factor which controls this possible development of Mr. Cross' property.

Now, unfortunately, I will have to go into the question of hydraulics, which are rather profuse, and I will ask you to bear with me while I labour through that, and try to make myself clear.

I have these exhibits all paged in one booklet, so that the sheets shall not get separated and lost.

10 Q.—Will you file as Plaintiff's Exhibit P-62 this booklet containing figures, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and the typewritten contents entitled: "Average Duration of Flow in per cent and time in the Gatineau River. Elevations of water at Alcove and Wakefield since the Chelsea Plant has been put into operation, and estimate of cost of development F.T. Property."

(Mr. Ker, K.C., of counsel for defendant, objects to this evidence as not being rebuttal.)

(The Court allows the evidence under reserve.)

A.—Yes.

Q.—Will you explain what the first figure in this booklet P-62 is?

20 A.—This first figure is a reproduction of a profile of the Gatineau River published by the Quebec Streams Commission in their 1924 report. It is condensed on one sheet so that the different points of importance which I will have to refer to may be readily located.

The base of this curve are the distances in miles from the Ottawa River, and the elevations which are on the left hand side show mean sea level

30 Q.—Pardon me just a moment. I understand this is merely a reproduction of a part of this report, and it is not being put in as evidence, but as showing the things you have referred to and that you will refer to in the evidence you are going to give?

A.—Exactly.

Q.—And that you have brought it down, condensed it in length by cutting out that portion between mileages 20 and 25 and between mileages 25 and 31?

A.—Yes.

Q.—By breaking the lines?

A.—Breaking the lines.

Q.—That is so you would not have too big a sheet?

A.—Exactly.

40 Q.—On this there are certain distances at elevations which you are not proving as a witness, but which you are taking for granted?

A.—Which I am taking for granted. I will refer to the questions of levels later on.

Q.—On this figure 1 I see there is high water elevation at Chelsea Point, 320, and that is a red ink line?

A.—That is a red ink line I have added. That is supposed to be the elevation of the total water of that part of the Cascades belong-

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ing to Mr. F. T. Cross.

BY MR. KER:

Q.—Where do you get that?

10 A.—I am coming to that in one minute. This curve has been plotted for summer conditions of 1923 as stated in the report to the Quebec Streams Commission. The elevation shown on this curve for Wakefield Village is 312.27. Mr. Scovil produced a curve, a rating curve, showing the flow at Wakefield for that level, and it comes to around 6,000 feet per second. With that flow the elevation of the bottom of Cross' curves given by his own figure is 304.

Q.—Given by whose own figure?

A.—Given by Mr. Scovil's own figure in his exhibit, is 304, and that has been reproduced on that simply to give an impression what the head is available that might possibly be used by Mr. Cross in his development.

20 No, the high water mark of 320, which is also marked in red, is taken from an exhibit which contains a section of your Chelsea Power Plant, upon which you have got the elevation 320 put as your high water mark, so that is a reproduction from your own figures, but I am not taking that into account.

Q.—When you say, "Reproduction from your own figures", what do you mean?

A.—From their own figures submitted.

BY MR. ST. LAURENT:

30 Q.—You mean the figures submitted for the defendant by witnesses examined on behalf of the Gatineau Power Company?

A.—I forget whether by Mr. Scovil or Mr. Simpson, but it is a profile of the Chelsea Power Plant giving the high water level, and the low water level for the plant, and the high water level is indicated at 320.

40 Before going into this, perhaps I had better state certain premises from which I went in arriving at the conclusions to which I come. First, that the water on the Gatineau River at Cascades, or on that part of Cascades rather. It has been shown by an exhibit, this aerial photograph, whichever that may be, as belonging to Mr. Cross.

Q.—There are two aerial photographs?

A.—Exhibit D-71, the property shown as belonging to Mr. Cross, by taking the light lines on the right, that you should consider lines, and not this wavy curve going across the river. Mr. MacRostie has stated in his testimony that the bulk of the water in the Gatineau River flowed on the west shore at low water; the east shore

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was bare, and that he walked over it.

Q.—What does the photograph D-71 show in that respect?

A.—The photograph D-71, which is a photograph of the same spot taken before the Chelsea Power Plant was complete, shows logs stranded on the east shore slightly above Mr. Cross' property. It shows logs stranded on the east shore at the bottom part of the property which belongs to Mr. Cross. This is the line of the property to which I refer, that is to say, the straight lot line across the river. The logs are shown on the east side of the river. These (indicating)
10 are all logs which are stranded there. Logs are stranded here, and logs are stranded there (indicating).

Now, Mr. MacRostie stated that the river flowed from the east toward the west and nearly the totality of the water flowed on that property which belonged to Mr. Cross.

Q.—That is to say, on the western side?

A.—On the western side.

Q.—According to your experience, in reading and interpreting aerial photographs, does this Exhibit D-71 bear out that statement of Mr. MacRostie or not?
20

A.—It confirms that statement absolutely.

The second premise is that the elevation showing the total water given to me by Mr. MacRostie

Q.—And given in evidence?

A.—And given in evidence. I did not read it. I think it is given in evidence—given by Mr. MacRostie is that elevation is not the lowest water elevation of Mr. Cross' property, but that it represents a fair division of head between possible power plants on Mr. Cross' property, and one on the Canada Cement property, which means
30 that the water which flows on the east side of the river, which is very small in quantity, that a higher head is balanced by that amount of excess water, for instance, on the west side by a slight head which he leaves out and does not give any meaning to tail water at that elevation. That is the second premise.

There is a difference in the elevations for tail water given by Mr. MacRostie, and those given by Mr. Scovil for the tail at Cascades.

I am much inclined to take the elevations given by Mr. MacRostie, for I have confidence in his work and in his judgment. In
40 view of the fact that we have to face the worst possible conditions, and not what might be better, I have admitted for the sake of this discussion the figures submitted by Mr. Scovil for the elevation of tail water at Cascades, which shows to the disadvantage of Mr. Cross to the extent of nearly a foot.

Q.—So, in fact, the figures you have used for the tail waters at Cascades are Mr. Scovil's, although you would be inclined to think you might use the figures of one foot better obtained from Mr.

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MacRostie's elevation?

A.—Exactly, so that I have substituted the figures of Mr. Scovil for those given by Mr. MacRostie.

Mr. MacRostie also gave me the average duration of flow in the Gatineau River for 16 years' duration, and I will ask permission to have Mr. MacRostie, who is here, certify these.

10 Mr. Ker: May I ask again for my own information, just exactly what it is you are trying to prove by this witness?

Mr. St. Laurent: We hope to prove by this witness that we can use a ten-foot head at Cascades without interference, by back-water curve with Paugan.

Mr. Ker: Ten feet instead of fifteen?

20 Mr. St. Laurent: At 10,000 we can use 14, but we can use 10 at all stages without any interference with Paugan.

Mr. Ker: No matter what the flow may be?

Mr. St. Laurent: No matter what the flow may be.

Mr. Ker: I submit this is not new evidence. Mr. MacRostie's evidence was to the effect that there were 9 feet.

30 Mr. St. Laurent: Mr. MacRostie was not asked that in the Examination in Chief. We proved in Chief there was a difference in elevation in the physical situation, and then in Cross-Examination you asked Mr. MacRostie about the variations coming from the difference in flow.

BY MR. KER:

40 If your statement is to prove that you have now 10 feet under flood flows, I would refer you to Mr. MacRostie's evidence at page 185 where he states, "I would say you have close to 9 feet."

Mr. St. Laurent: Page 185 is part of the Cross Examination, and our statement is that we are not precluded from rebutting evidence given by the witnesses in defence because it so happens the defence in Cross-Examination of our witnesses put similar questions.

Mr. Ker: Am I then to understand that this witness is brought

forward to state that the evidence of the witness MacRostie is not accurate to the extent of one foot.

Mr. St. Laurent: This witness is brought forward for the purpose of contradicting the evidence of Messrs. Scovil and Simpson as to the effect of backwater curve on the Paugan development.

10 Mr. Ker: He is apparently contradicting Mr. MacRostie as well.

Mr. St. Laurent: That is not part of our evidence. That is something which you attempted to bring out in Cross-Examination.

20 Mr. Ker: This will necessitate the reopening of the whole case on these technical details. If Mr. Beaubien is going to give evidence on the effect of backwater on the proposed Cascades development, surely we will have the right to make our own proof of the facts. My learned friend has made proof definitely and fair that there is a 9-foot head under flood flows available. Now, my learned friend brings this witness forward with a long statement and plans to show there are 10 feet head there. Surely, that is a fact proven in Examination-in-Chief. If we are going on in this way we would have the right to disprove the witness and keep on *ad lib*.

His Lordship: I will reserve the objection.

30 Witness: The curve indicated in figure 2 shows the average duration of flow of the Gatineau River under its natural condition, that is, flow is indicated on the bottom of the diagram. On the left you have the figure "4,000." 4,000 cubic feet flow if you read up— at 4,000 you have about 91 per cent of the time. You could count on a flood of 4,000 cubic feet for 91 per cent of the time, and a flood of 10,000 feet for about 37 per cent of the time; a flood of 20,000 feet for about 15 per cent of the time, and so on, as the flow increases you can count on that. You can have that for much less time.

40 This is compiled from figures taken by Mr. MacRostie, and covers a period of 16 years. These figures have been added in tabular form in the back so it can be checked, from the actual figures given to me by Mr. MacRostie.

Mr. Montgomery: Would your Lordship allow Mr. MacRostie to give his evidence now, after he has testified in Chief on the same subject matter? If Mr. MacRostie could not be permitted to give this testimony now, could Mr. Beaubien, much less, introduce it?

Mr. St. Laurent: Mr. MacRostie certainly could be permitted

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to give these figures now. He was cross-examined as to certain features of that. Our statement is, you cannot take away our right to rebut the evidence you may make on your plea, by putting certain questions that you did in cross-examination to our witnesses. I think that has been decided many times. We, ourselves, purposely and designedly omitted to go into that, and it was part of your plea, and we are now attempting to disprove it.

10 (The Court reserves the objection.)

Witness (continuing): Mr. Scovil produced a number of curves showing the elevation of the water in the river at different points. These figures, curves, have been accumulated in one sheet and figure 3, so that we may see them at a glance, and are able to establish a relation between one and another. On this figure 3 we have the flow in the river, 10,000 cubic feet, shown on the bottom of the picture. On the left the mean sea level elevation is shown, and from it we can cover the levels of the river and know all conditions.

20 The flow of the river is 4,000 cubic feet second as shown at the bottom; on the left hand side, 4,000 cubic feet second shown on the base, and as we go up we see the elevation at the foot of Cascades from point C referred to by Mr. Scovil. We see the elevation is about 302.8, and the head of Cascades is 309.2. Wakefield Village is 310.1 and Alcove is 317.2, and Paugan 320.2, that is, always at a flow of 4,000 cubic feet second, that is, the levels of the river, you read up, over 4,000. If you take 10,000 cubic feet flow, we have again the levels of those important points in the river, as you go up, first is point C, then point A, then Wakefield, then Alcove and on top the
30 last curve, Paugan tail race. Then, if we go from left to right we see what the elevation is at any of these points for all the flows, starting at 4,000 cubic feet, and as you go to the right in any one curve, you see how the elevation rises to 305, at 10 feet for Cascades, point C, which is the lower curve; 307.4, for 20,000 cubic feet; 309, for 30,000 cubic feet, and 310 for 40,000 cubic feet, and 311.4 for 60,000 cubic feet at Cascades.

40 At each of the other points we have indicated the same story, the elevation of the water under natural conditions at that spot for that flow, so that by taking any flow in the river and reading up we get the elevations of all those points, and taking any curve for any one spot we get the variation in elevation at that spot for variation in flow. Now, that is the basis and shows conditions as they existed. Upon that I will try and make changes and see what can be obtained.

The first thing that Mr. Cross could count upon was regulation, and it was quite reasonable for him to expect that the regulation of 10,000 cubic feet could be counted upon, then, as it was realized, practiced.

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Then, it is reasonable that the head at the top of Cascades might be raised instead of having only a drop of 6 feet as shown in a curve submitted by Mr. Scovil that that head might be considerably increased.

10 In order to see whether this could be done, we have to assume that the curtain dam or some sort of moveable dam is built at Cascades, and with that we can raise the water in the stretch of the river coming from the top of Cascades to Wakefield Village, or the foot of what is called the Pêche Rapids, and in that stretch of the river was a figure 1 between miles 14½ to approximately 19.

BY MR. ST. LAURENT:

Q.—At the adjournment I think you had finished discussing your figures 1, 2 and 3, which relate to the topography and the variation of elevations at different places resulting from the topography, and the variations in flow, and you had commenced to explain your figure 4.

20 A.—Between Wakefield and the top of Cascades there is a stretch of approximately five miles of river. In that stretch of the river, as the flow increases in the river the drop would naturally increase. We have to find what effect the raising of the water at the top of Cascades will have at Wakefield, so that we may work from Wakefield up afterwards.

30 On figure 3 we have the difference of level under ordinary conditions between the head of Cascades and Wakefield Village, that is between the curves marked “Head of Cascades, point A”, and “Wakefield Village”. Of course that difference in level increases as the flow increases.

From those two curves, which were submitted by Mr. Scovil, it is possible to work out the hydraulic constants, which we can apply afterwards to any set condition and see what effect it would have on the head at Cascades.

I would ask you to turn to figure 4. If we raise the head at Wakefield to an elevation of, say, 320 (which is indicated by a red line on that figure) you see the head starts from 320 to a point approximately opposite 35,000 cubic feet, where the natural head at Wakefield becomes greater than 320.

40 Of course, if we assume it to be kept constant at 318, and then we find what elevation may be maintained at Cascades, we find the curve marked 320, which is a curve sloping down, which will indicate the level we can get at Cascades.

When there is very little flow in the river, if the head at Wakefield is 320, we can hold a head of 320 at Cascades. As the flow increases that head will fall gradually.

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As a matter of fact, those curves have been calculated for an elevation of 320, with a flow of 10,000 cubic feet, so that at 4,000 cubic feet it would be brought up to one-tenth or so higher.

At 20,000 cubic feet there would be a drop in the river of between 320 and 319.4—about .6 of a foot—giving an elevation mark of about 319.4.

At 30,000 cubic feet, the elevation would be 317.5, and at about 35,000 cubic feet it will fall to natural conditions at Cascades, as it does at Wakefield, and then the elevation would be about 315.5.

10 If as the flow increases we raise the water at Wakefield, and instead of taking 320 at Wakefield we take 321, we find the head then will not reach natural condition until we get over 40,000 cubic feet. If we take 322, it will not get to natural conditions until we reach something like 47,000 cubic feet. If we raise it to 324, then it comes to about 59,000 cubic feet.

20 If we start with a given head at Cascades, say 10 feet—and I refer you to figure 5, upon which I have drawn a curve showing a constant head of 10 feet at Cascades by a heavy line marked "Elevation of water at Cascades for a head of 10 feet". That line is exactly similar to Cascades point C, but it is 10 feet higher in elevation.

We see this 10-foot line will require the water to be raised above Wakefield to elevations which are marked "Elevation of water at Wakefield for a head of 10 feet at Cascades". If this 10-foot line requires the water to be brought to elevation 320 for a flow of 28,000 cubic feet, you can see the elevation for the elevation of Wakefield passes through elevation 320 at that flow. It is the same.

30 When we get to 50,000 cubic feet, we find it requires an elevation of 324. You see where it passes the curve for 324, and the line of Wakefield is marked as passing that point at elevation 324.

So if we can maintain a head—and we can maintain a head—at Wakefield varying from 319 to 324, we can get a constant head at any flow of 10 feet at Cascades.

Those drops of elevation of water at Cascades have been checked against actual river elevations after the plant at Chelsea was started and the water elevated at Wakefield to approximately those levels, and they check exactly with those curves which have been worked out.

40 Now we come to that stretch of the river between Wakefield and Alcove, which includes the Pêche Rapid

Q. (interrupting)—Why do you use Alcove as a point?

A.—Because there was a Government gauge at Alcove which had been set and read for a long time by Government officials, and it is comparatively close to the top of the Pêche Rapid. This discussion might apply to the two points at Wakefield and Alcove which correspond approximately to the levels across the Pêche Rapids, and,

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as far as the discussion would be concerned, I do not think there would be any difference. It is really between the points of Wakefield and Alcove.

Q.—I understand you have a graph that uses Alcove, because Alcove is one of the measuring stations for which you obtained accurate data?

A.—Yes.

Q.—But it does not otherwise enter into the problem?

10 A.—No. It just happens to be very close to what would be above Wakefield.

Q.—And it is a point where you had accurate data?

A.—Yes: that is the reason Alcove is chosen.

20 With the curve submitted by Mr. Scovil for the elevations at Alcove and the elevations at Wakefield Village, at variable flow, I attempted to work out what the drop would be under different hydraulic conditions, and I found it extremely difficult, in fact impossible, to arrive at a satisfactory figure. We, therefore, searched for additional figures, and I found the elevations at Alcove had been kept after the water had been raised at Chelsea to approximately the conditions required here. From those results I could calculate exactly what the drop at Alcove, across the Pêche Rapids, would be for variable flows—and this I have done. These elevations are plotted on figure 6. They were taken from actual observation, and they are represented by the two heavy lines in the small square. They are brought back to the general form of diagram adopted, so that their relations might be directly visible on the chart.

30 Those curves are further plotted in the following diagram (No. 7) on an enlarged scale; the dots showing the observations are marked. Of course, the elevation at Wakefield being controlled by the dam, the operation at Chelsea would give a varying elevation because as the gates are opened the head would fall a little, and as they are closed it would rise. Those figures had to be averaged on those curves in order to get the working curves which are drawn on this diagram. I might say there are something like 150 observations on each of those two curves, and those curves are the average of those, based on the flow, and the flow in this diagram is from 5,000 cubic feet second to 30,000 cubic feet second. The observations were taken as the river rose, and again as the river fell, so they gave a
40 very close check.

You will note the elevations at Alcove did not vary to a very great extent, and they are not very much higher than they were under natural conditions.

For the Alcove line, Exhibit D-77 of Mr. Scovil shows the river in its natural condition, while this curve shows the elevation of the river when the water had been raised from natural condition, which is somewhere around 312 or 315 or 316, to over 318 to nearly 322.

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From these curves it has been possible to calculate the hydraulic constants that would allow us to determine the conditions which very closely approach those for the operation of a plant at Cascades with a constant head of 10 feet at high flows.

I might say the figures shown on this diagram are set forth in tabular form and are attached to the diagram so that they may be checked if required.

10 From the hydraulic constants obtained from those curves it has been possible to calculate the elevation at Alcove for any fixed elevation chosen at Wakefield. If the water is maintained to 318.3 at Wakefield there would be no effect whatever at Alcove at 10,000 cubic feet and above. If the water is raised to 319, the elevation will be raised at Alcove from 320.7 to 321.2. If elevation 320 is maintained at Wakefield, the elevation at Alcove will be brought up to 321.7.

20 This elevation at Alcove has been calculated for all flows up to 30,000 cubic feet, and the line shown on this diagram as 319 means the elevation at Alcove for an Alcove elevation of 319 at Wakefield. It is the same with 320, 321, 322 and 323.

30 To bring back this diagram to the diagram we have adopted for general conditons, and show the relative perspective, figures have been drawn on figure 9. If the water is maintained at 319 at Wakefield it would have an effect of half a foot at Alcove. If the elevation is maintained at 319, as the flow increases instead of diminishing, the moment the flow gets larger than 10,000 cubic feet second it ceases to have any effect whatever above Alcove, and does not start to have any effect again until it gets to over 20,000 feet second—nearly 21,000 cubic feet second. When it gets to 21,000 cubic feet second
40 it starts to raise the water slightly above Alcove, to an extent of something under half a foot, and that remains constant for all flows above that up to 60,000 or 70,000 cubic feet second, for the curves are practically parallel to the natural conditions of the river, and about half a foot higher. This means that we have a constant head of 10 feet at Cascades for high flows up to 21,000 cubic feet second, and it will affect above Alcove only above 21,000 cubic feet second, and to an extent of less than half a foot. Then it would have no effect whatever until we get to 10,000 cubic feet second, where again it will have an effect of about one-half a foot. As the flow gets lower, the effect will be slightly greater; but I am not taking that into consideration, as the flow between 10,000 cubic feet second is not interesting in this case, the water in the river being regulated and it can be counted as being regulated to approximately 10,000 cubic feet second flow. A plant under those conditions could be operated at an elevation of 319 at 10,000 cubic feet second flow, affecting the water above Alcove to the extent of only .4 of a foot, and not affecting it at all until you get to 20,000 cubic feet second, then only to less than

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half a foot.

I might say this half a foot rise in water at Alcove means, with the ordinary calculations, less than two-tenths of a foot at the foot of Paugan.

10 This is calculated with the conditions of the river as they are: that is to say, the river arrives at a certain elevation naturally, and we take the hydraulic constants for the river under natural conditions of flow and apply them to the conditions created by banking the water up. Natural conditions mean the water is increased in speed, and there are eddies and numerous losses in the river caused by the increase of velocity in the current. If you back the water up, and bring it back to the same conditions, the hydraulic conditions would be better than the ones you had found by taking the natural conditions, because you drown out a lot of those eddies, and slow down your current, which means there is less loss; so, I do not think this .2 would exist at all in reality. I am absolutely convinced you could get a head of 319 at Alcove and have absolutely no effect on the foot of Paugan, and the most that could possibly arise would be
20 less than .2 of a foot.

Which means, in summary, that a power plant with a constant head of 10 feet at high flows at Cascades could be built, and at 10,000 cubic feet second this head might be raised to elevation 319, giving a head of 14 feet at Cascades. A 14-foot head on that river means 14,000 horsepower, at 10,000 cubic feet flow, 100 per cent load factor; but, as you have a pond and you can use the water at 70 per cent load factor (and that is the standard method of measuring power), it means you have 20,000 horsepower available there under all conditions of flow of that river.

30 Mr. Simpson has submitted figures and costs for a development at Cascades with a head as low as 5.2 feet. The turbine design which will develop the power he has given, 1,340 horsepower, per unit, at 5½ feet, happens to be exactly the size of a turbine that will give 3,400 horsepower under a 10-foot head, so, so far as size is concerned, it means the waterwheels would be capable of 3,400 horsepower per unit under a 10-foot head, and the power house would be big enough to take care of the units that would be required to develop 3,400 horsepower per unit. Seven units means a total machinery installation of 23,800 horsepower, with the same machinery he has.
40 Of course, the power house would have to be deepened a little in order to allow a greater flow of water through the waterwheels, but that amounts to less than 10 per cent. The generators would have to be enlarged in order to take care of the greater power. However, with a power house practically the same as that which Mr. Simpson has submitted (and which I accept for this purpose), and with this power house enlarged as necessary in order to give it a little greater depth and take care of the additional excavation required, I find a

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power plant to develop 20,000 horsepower at 70 per cent load factor costs \$144.60 per horsepower, and on the basis of the machinery installed, \$121.00 per horsepower—which comes within the usual figure of cost of development per horsepower.

Q.—How would these figures compare with the cost of the horsepower at Chelsea, from the published reports?

A.—From the reports, the bonded issue for all the developments of the Gatineau Power, on the machinery installed, comes to \$140.00 per horsepower. The machinery installed at Chelsea is 170,000 horsepower, if I am not mistaken, and the firm power there is about 96,000 horsepower; so there is practically machinery installed for double the amount of low water flow there is in the river.

Q.—You are not criticizing that, I understand?

A.—No, I am not criticizing it at all. On the basis of 70 per cent, it would bring the cost a great deal higher than that; and on the basis of 100 per cent, even greater still. Those figures are away above the \$140.00 per horsepower—it might come to \$210.00 or \$220.00; I have not worked it out exactly.

Q.—That installation of machinery very largely in excess of the firm water power available is good engineering practice?

A.—Yes.

Q.—And common engineering practice?

A.—Common engineering practice.

Q.—And it allows you to operate at 70 per cent?

A.—It allows you to take advantage of any increased flow in the river which may arise. Of course, in this river it does not arise for any great length of time. With the regulation kept to 10,000 cubic feet second, the increased flow over 10,000 cubic feet would be very much reduced, so the high flows will not exist for very serious periods.

Q.—Does the typewritten sheet figure 10 show the different additions that would have to be made to Mr. Simpson's costs, to alter his development to one which would use a 10-foot head at high flows and a 14-foot head on the 10,000 cubic feet second flow?

A.—Yes. I have accepted his figures throughout, and I have only increased such equipment as would have to be increased in order to make it suitable for the additional power.

Q.—How would you go about getting the head at a given point?

A.—Of course it would come in quite a natural way. The Chelsea plant is in exactly a similar position to that in which a plant would be at Cascades. If they allowed the head to drop at Cascades, the drop in the river between Cascades and Wakefield would be very great, and it would lose a great deal of head. By raising the head a little at Wakefield you make up for that loss in the five-mile stretch.

I have plotted on figure 10 the elevations at Wakefield in the years 1926 to 1929, and it shows the history of the raising of the

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water at Wakefield. 1926 was before the plant was built. 1927 was when they started building it. You can see how the water at Wakefield rose in the low water periods from 1926 to 1927. That was when the dam at Chelsea started to back the water up. An operator in the plant at Chelsea, as an operator of the plant at Cascades, would naturally raise his head, or allow his head to raise, at Wakefield in operating. It would come quite naturally. As a matter of fact, I think it would be very difficult to stop an operator from doing it under normal operating conditions.

10

Q.—How, physically, do you install your plant so that you have the capacity to do it?

A.—Your operator would have instructions to maintain the head at 10 feet, and when the flow got above 20,000 feet he would be instructed to open his gates and let the water go through his gates controlling the level of the water at Cascades.

Q.—Are those hydraulic dams built in such a way that the elevation of the obstruction can be varied?

20

A.—Yes, they always are built in that way. They are built like that at Chelsea now.

Q.—Is that why you referred to it as a curtain dam?

A.—I referred to it as a curtain dam as an expression of something that would convey the impression that it is moveable. As a matter of fact, they are stop logs which are taken out of the river as the flow increases, in order to allow the excess water to go by.

Q.—So those hydraulic dams are not something solid and permanent which maintain a constant elevation?

30

A.—No. In a river which has a fluctuating level you must have something to control the level or it might get away from you and cause damages which you might be called upon to reimburse.

Q.—You spoke of gates. Just what did you mean?

A.—The dam has openings, which are generally closed with heavy logs. Those logs are removed as may be desired in order to allow the excess water to go by.

Q.—So, if the flow becomes greater you lower the top of the dam?

40

A.—If the flow becomes greater you lower the top of the dam to allow the water to run through.

Q.—Is that common practice in hydraulics?

A.—Common practice. It is used in nearly every case. I do not know of any case in which it is not done.

Q.—Then, your dam would have to be erected in such a way that it would be a few feet higher at some periods than at other periods?

A.—Yes. The dam designed by Mr. Simpson would do that.

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It does not have to be altered at all. There would be no difference at all in the power house, or sluice weirs, or section.

Q.—The only difference, then, would be in the way of operating it?

A.—There is a little difference, in deepening the entrance to the power house, and the exit for the water from the power house. That would be the only difference, and it is only a small amount.

10 Q.—Then, would it be just by the mode of operating that you would be using a 14-foot head under a 10,000 cubic foot flow, and a 10-foot head that would bring you up to a 20,000 cubic foot flow?

A.—As the flow increases you would have to take out your logs to take care of the excess flow, and that you would do under the natural condition, to avoid damages. As a matter of fact it probably is being done now.

Q.—You say a 10,000 cubic foot second flow, operating under a 14-foot head, would give about 14,000 100 per cent horsepower?

A.—Yes.

20 Q.—If you had to bring that head down to 10 feet, having the increased flow, what horsepower would you be getting out of the same wheels?

A.—Exactly the same horsepower, because your wheels would be designed for that. You will get 14,000 horsepower with a 10-foot head; which means the wheels would be opened a little wider. Those wheels are so designed that they will do this.

Q.—So, the wheels upon which you have made the additions to Mr. Simpson's costs are wheels which will give you the required power at the high flows under a 10-foot head?

30 A.—Yes. The wheels chosen by Mr. Simpson will give 3,400 horsepower at a 10-foot head. That is the low head under which this plant would be operated.

Q.—And, as the flow decreases the head can be raised sufficiently to have your 10,000 cubic feet second continuously?

A.—Yes. We could so operate at 319.

40 Q.—I understood you to say in one of your answers, as a conclusion from the graph at which you were looking, that you could maintain the elevation of 319 at Alcove without affecting Paugan. It was my impression that was perhaps a slip, and that what you meant to say was that you could maintain the elevation of 319 at Wakefield without affecting Paugan?

A.—It is an elevation of 319 at Wakefield.

Q.—My impression is you said Alcove?

A.—As a matter of fact, at 10,000 cubic feet second it is 319 at Wakefield. If I said Alcove I made a mistake.

Q.—I think you did say Alcove.

A.—Then I made a mistake. It is at Wakefield.

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Q.—319 at Wakefield is what your calculation is based upon?

A.—Yes. With 10,000 cubic feet second flow.

Q.—This typewritten tabulation following figure 7 is entitled:
“Obtained from the Department of the Interior.” Did you obtain those figures?

10 A.—No. I obtained those figures as regards flow, as published in Bulletin No. 58 of the Natural Resources Branch of the Department of the Interior. I obtained the elevations from Mr. MacRostie, who, I understand, obtained them from the Department of the Interior.

Q.—The flows were all you personally obtained from the Department?

A.—That is all.

Cross-examination

CROSS-EXAMINED BY MR. DESSAULLES, K.C.,
OF COUNSEL FOR DEFENDANT:

20 Q.—Did I understand you correctly as saying that your technical training had been largely electrical, and that you then branched off into hydraulics?

A.—I would say my training was pretty general, but I specialized in electricity for the first years.

Q.—You are still acting as a member of the Electrical Commission in the City of Montreal?

A.—I am.

Q.—That has no relation to hydraulics?

A.—No.

30 Q.—Have you made any development comparable to any of the developments on the Gatineau?

A.—If you mean comparable with what Mr. Cross' development would be, perhaps not.

Q.—Nothing of the same size?

A.—No.

Q.—Have you erected any large hydraulic developments?

A.—Some hydraulic developments, but not the size of Chelsea or Pagan.

Q.—Where were those?

40 A.—I built a plant at St. Jerome, which has been bought by the Gatineau Power Company. It is a smaller plant.

I referred to the tailwater depressor; that was for 100 per cent load factor plant at St. Albans. It has been taken over by the Shawinigan Water & Power Company.

Q.—How large a development was that?

A.—Firm, 4,000.

Q.—Was it ever developed to that figure?

A.—Yes.

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Q.—By yourself, or by the Shawinigan Company?

A.—By the Shawinigan Company.

Q.—What was it developed to by yourself?

A.—It was the same development. The Company operating it had a mishap; a part of a mountain fell into it, and the cost of development became so great that it was sold.

Q.—The Shawinigan Company really rebuilt it?

A.—They continued it.

Q.—They rebuilt it, did they not?

10 A.—They used what was built, and continued it.

Q.—The work that was done there was only the initial work, I understand?

A.—No. The power house had been built when this happened. They had to rebuild the power house, but they used the dams.

Q.—What part of the work was done by you?

A.—The dams.

Q.—What other development did you direct?

20 A.—I put in a plant for the Town of Drummondville. That was taken over by the Southern Canada Power Company later.

Q.—What was the size of that development?

A.—A small power.

Q.—How much?

A.—1,000 horsepower.

Q.—Were there any others?

A.—No, not that I completely developed.

Q.—What is the differential surge tank?

A.—A differential surge tank is a reservoir put into a long conduit to allow a reasonable regulation of waterwheels at the end of it.

30 Q.—That would be in draft tubes?

A.—No, in intakes. If your waterwheels have a sudden load thrown upon them, the current in the long pipe would have to be accelerated, and that would take some time, and by the time the water had reached your waterwheels the voltage of the power would have gone down, and there would be poor electrical regulation. In order to offset that there is a special type of tank designed.

Q.—A sort of regulating device?

A.—Yes.

Q.—You have not applied that to Mr. Cross' scheme?

40 A.—Mr. Cross does not need any. He might need a tailwater depressor, and still improve his conditions.

Q.—What was the nature of the work you did at the Montreal Cottons? In Valleyfield?

A.—That was a question of deepening a long tailrace tunnel in order that there would not be any backwater effect on the waterwheels. It is exactly similar in calculation to the work required to find out what head you would get in this case.

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- Q.—To get the net head?
A.—To get the net head, yes.
Q.—Did you figure on doing any work of that kind for the plant
you imagined for Mr. Cross' property?
A.—I have done it for this.
Q.—In what way is it done?
Witness: Do you mean the compilation of backwater for it?
Counsel: Yes.
A.—That is done. That has been the object of all this work.
10 Q.—It is to show that there is no backwater?
A.—To show what there is in extent and quantity in backwater,
and what the effect is, and at what point of the river.
Q.—I am very much of a layman in matters of this kind
A.—(interrupting) Then, perhaps I had better explain it all
over again. I am afraid I have not made myself clear.
Q.—Perhaps you may have to do that later on. In the meantime,
assuming you were to make a development for Mr. Cross, where
would you place your power house?
20 A.—I would place my power house slightly farther downstream
than Mr. Simpson put it.
Q.—Why?
A.—Because I think it would give better hydraulic conditions.
Q.—In what way?
A.—I think there would be less loss in your power house, and
less loss in your intake.
Q.—What about the tailwater?
A.—The tailwater would be the same in either case.
Q.—I suppose you assume that Mr. Cross would control all the
30 property above?
A.—I assumed he had rights to acquire that property, I suppose
as the Gatineau Company had.
Q.—Or that he would get those rights?
A.—Yes. The cost of that has been included in those costs of
our development.
Q.—You also assumed that he would have the right to a regu-
lated flow?
A.—Yes.
Q.—On the same lines as they have now?
40 A.—As they have now.
Q.—In your estimates (and I have not had time to read them
yet) did you figure anything for payment to the Government on the
basis of the regulation?
A.—I have not gone into the cost of a horsepower year at all. I
have only given the capital cost of development. The payment to
the Government for regulated water would be a payment for horse-
power year for operation.

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Q.—Of course, it would only be a very small development as compared with the possible development of the Gatineau? It would only be a partial development—at most, 20,000 horsepower, with 70 per cent efficiency?

A.—Seventy per cent load factor. Yes, in comparison with the Chelsea plant, which is 96,000 horsepower, 100,000 firm power; 20,000 to 100,000.

Q.—That would be about one-fifth?

A.—About one-fifth of Chelsea plant.

10

BY MR. ST. LAURENT:

Q.—If it is 96,000 firm, it would be more than 100,000?

A.—Yes, it would. It would be about 120,000. It would be one-sixth, instead of one-fifth.

BY MR. DESSAULLES (continuing):

20 Q.—Are there any of the figures contained in your Exhibit P-62 that are the result of personal observation on your part?

A.—Yes; the calculations are my personal calculations.

Q.—But I am referring to the data.

A.—It has been taken from official sources, either directly or through Mr. MacRostie, or from exhibits submitted in this case by Mr. Simpson or by Mr. Scovil.

30 Q.—Take, for instance, the table which follows figure 7, and which is entitled: "Elevations of Water at Alcove and Wakefield since the Chelsea plant has been put into operation". What are the figures you say were obtained from the Department of the Interior?

A.—As a matter of fact, to the best of my knowledge they have all been obtained from the Department of the Interior. The figures as to the flow I personally took from Bulletin 58 of the Natural Resources Branch of the Department of the Interior. The elevations were taken by Mr. MacRostie; he will tell you where he got them.

Q.—They are those to which he referred in his evidence?

A.—I do not know whether he referred to them or not.

Q.—You did not check them with his deposition?

A.—No.

40 Those are elevations taken in 1927.

Q.—Do you know if Mr. MacRostie's figures were taken by him or were taken from records of the Department of the Interior?

A.—I am convinced they were taken from the Department. Some of them were taken by him. In my premises I have taken those figures as being correct, and I believe them to be correct.

Q.—Is the figure of flow a figure given in the books of the Department of the Interior, or is it a deduction which you make?

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A.—They are taken directly from the book of the Department of the Interior.

Q.—Can you give me the reference to that book?

A.—“ Water Resources, Paper No. 58 ”, published in 1929. It is the “ Surface Water Supply of Canada, the St. Lawrence and Hudson Bay Branch, Ontario and Quebec, for the years 1925-26, 1926-27 ”, published in 1929. It is entitled: “ Water Resources: Paper 58 ”. You will find at page 179 that you have the flood flow of that river for the year 1926-27.

10 Q.—Have you any information as to where those figures come from?

A.—Yes. There is a note at the bottom to the effect that they were taken either from Chelsea or Paugan. “ Taken at Paugan gauge ”. Those flows were taken at Paugan gauge.

Q.—Whose gauge is that?

A.—I do not know.

Q.—Do you know if that gauge was changed after the raising of the water level at Chelsea?

20 A.—By the figures of the Department I know it was not, and I take those figures as correct.

Q.—Why do you choose that period rather than any other?

A.—Because it gave the uniform rise and drop in the level for the greatest variation in flow that I could get.

Q.—Did you pick that period out from several periods?

30 A.—I picked that period out from the elevations of the water at Wakefield; then I had a gradual rise of the water over that period from the elevations of the water at Wakefield, and I looked up to see the variations in flow and found it was a condition that would give me the widest scope for calculation of the hydraulic constants.

Q.—Did you look at the summer period for any other years—later?

A.—No, because I only had the elevations for a number of years. I did not have them for Alcove since that plant has been put into operation. I had them for a few months more than is indicated.

Q.—Supposing you were called upon to build a plant, or to give estimates, or to advise a contractor on the cost of work there to provide a certain development, would you not require much more information than what is contained in those few months' figures?

40 A.—No. I think the elevations would be brought very close to the conditions I wanted to find out about, and those are the figures that approach them more closely than anywhere else. Any error would be much less marked with flows taken under the conditions I wanted than with those taken very much farther away.

Q.—Have you visited the site between Chelsea and Paugan?

A.—I have visited the site at Chelsea, and from Chelsea to Cascades, and from Cascades to Wakefield, to the rapids, and to Alcove.

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From Alcove I did not go up to Paugan.

Q.—How much time did you spend there?

A.—I went there on different occasions. I suppose I spent two or three days on the spot.

Q.—Was it with a view to preparing your evidence in this case?

A.—Yes.

Q.—When were those visits made?

A.—The last one was since the last sitting of the Court. Before
10 that I think I was there just about when the water was raised.

Q.—Did you see the river in its natural condition before the water was raised?

A.—I think I did.

Q.—When?

A.—I think I went with Mr. Cross and Mr. Busfield on one occasion before; I cannot tell you now just when it was.

Q.—Did you personally make any observation of elevations?

A.—No.

Q.—To ascertain whether the water was following the west
20 shore, or the east shore?

A.—No. I did not look into that at all at that time.

Q.—Did you at any time have any cross sections of the river before you?

A.—Yes. Since we went there we got sections of the Pêche Rapids.

Q.—Who did?

A.—Mr. MacRostie got them. We went there and decided what was wanted, and he got the sections.

Q.—Do you mean he prepared them himself?
30

A.—I do not know whether he prepared them himself, or had his men prepare them. I suppose he had his men prepare them.

Q.—Just at the Pêche Rapids?

A.—Yes.

Q.—Would that be sufficient for you to base your calculations upon?

A.—Yes.

Q.—Just at one place?

A.—It was the Pêche Rapids. Not at one place.

Q.—On what stretch of the river was that?
40

A.—All that could be obtained at the depth of water there was taken. I suppose it covered 400 or 500 or 600 feet of the Pêche Rapids.

Q.—What is the extent of the Pêche Rapids?

A.—About 1,200 feet. The rest was under water.

Q.—And that was before the Chelsea plant was built?

A.—No, since.

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Q.—Have you any of the cross-sections you can show me?

A.—I have some in my notes. They are not in shape to be produced. I can show them to you in my notes, if you wish.

Q.—Will you please let me see them, so that I may ascertain whether they would be of a nature to assist in controlling your figures?

(The witness exhibits the cross-sections to counsel.)

10 Q.—I understand the cross-section you show me was taken at two points?

A.—There are two sections there. Yes.

Q.—Are there any other points?

A.—I have a whole plan giving the contours and the depths, prepared by Mr. MacRostie, of that part of the Pêche Rapids of which I speak.

Q.—Did you have any cross-sections at any other parts?

20 Witness: In the river?

Counsel: Yes.

A.—No.

Q.—Why did you think a cross-section was necessary at Pêche Rapids, and not at any other place?

A.—Because the Pêche Rapid was the key to the problem.

30 The question of the drop on the rise of the river was checked by actual measurements of the drop in the river under operation at Chelsea plant, and was checked with the results; so we did not have to go any deeper into it. I had certain readings close to it, and I wanted to have something more precise, and to be sure, so I went into very much more detail on the Pêche Rapid than I did on the rest of it, and that is where the greater drop occurs.

Q.—Is not the Pêche Rapids really in the nature of a submerged weir?

A.—No. At first I thought it was, but it is not that at all. It is a long sloping rapid, 1,200 feet long, and there are only seven to twelve feet drop as the case may be.

40 Q.—And are you sure there is no rock at the head of the slope?

A.—There are rocks all over. It is nothing but rocks. It is partly solid rock at the top, but right below the solid rock it seems to have been filled in by boulders rolled along the bed of the river, and the river seems to have been filled up to a certain elevation. Anything above that was probably carried away, and it is smooth filled, partly solid and partly boulders.

Q.—Do you contend that you could raise the level of the water

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so as to eliminate the Pêche Rapids without raising the water above?

A.—To the extent of 319.

Q.—By holding the water to 319?

A.—To 319 affects it less than half a foot above at 10,000 cubic feet flow. That is from observations very closely to the actual conditions.

Q.—Observations since the plant has been built?

A.—Yes.

10 Q.—Your first premise, if I remember rightly, was that Mr. MacRostie had said the totality of the water went on the west shore?

A.—Nearly the totality.

Q.—What is the width of the river there?

A.—I suppose it must be 800 feet. It may be 900 feet. I am simply guessing at a scale.

Q.—I think you stated Mr. MacRostie had said he had walked over a portion of the rock there?

A.—I believe he said it in Court, and I know he said it to me.

Q.—He stated in Court that he had walked over 25 feet. 25 feet is a very small figure in proportion to 900 feet, is it not?

20 A.—Mr. MacRostie conveyed to me (and I have not the slightest idea he did not want to convey exactly what he said) that all the water went on the west shore. This is certainly confirmed by the aerial photograph Exhibit D-71.

Q.—According to the photograph, is there no water in the middle of the river?

A.—The photograph shows the logs on the east shore.

Q.—Along the shore?

30 A.—No. They go very close to the middle of the river. The parts colored white on the photograph are logs.

Q.—They might be stopped on rocks?

A.—If you look at it carefully you will see the logs. This is a somewhat overlarge photograph. It is made to represent the scale on a plan. You will see them very much better on the smaller plan. On this photograph you can see the logs, and you can see the direction in which they are lying. Apart from that they have been spoken of as being inside the pencil marks by the gentleman who produced the photograph.

40 Q.—There may be a considerable quantity of water between those places that are marked?

A.—The logs are shown there, and you can see them quite distinctly. If the current had been at all strong they would not have remained there. They are stranded.

Q.—This photograph shows the river in its natural condition?

A.—Yes.

Q.—Supposing at a given time there was less water, the logs might have been stranded there?

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A.—My recollection is the flow which on that date was given, and it seemed to convey to my mind a very normal condition of flow—not a low flow.

Q.—Supposing you were wrong on that, and supposing you were mistaken on the question of the east shore and the west shore, what difference would it make in your estimates?

A.—If the water was equally divided on both shores, it would make a difference.

10 Q.—As a matter of fact, Mr. Scovil divides the water equally between both shores, and I take it that would account for a great deal of the difference between your estimates and his?

A.—It accounts for a great deal of difference, as far as power is concerned.

Q.—It makes for a difference of nearly one-half, does it not?

A.—I do not know exactly how Mr. Scovil comes to the one and a half feet which he takes off. It means a difference of one and a half feet, if his reasoning is right.

20 Q.—And of course he has had the advantage of personal observation over a long period of time, whereas you were there for only two or three days?

A.—I understand Mr. Scovil also took figures from the Department of the Interior. That is what he seemed to base his testimony upon.

Q.—And also on personal observation?

A.—I do not remember he said the elevations were taken by him personally. My impression was they were delegated to someone else right through.

Q.—At page 127 of Mr. MacRostie's deposition I find:

30 “ If I might explain, the main drop comes in around E on the river, and impinging upon this point opposite F (that is on Exhibit P-1) seems to shoot towards the easterly side of the river, and goes in between some little islands that are there. The water is fairly deep around the pool G, and then goes back and flattens out towards C, and goes out on both sides of the island, and just touches the line between lots 20 and 21.”

That does not mean the totality of the water, or nearly the totality of the water, is on the west shore, does it?

40 A.—Yes, it does.

Q.—You think it does?

A.—Yes.

He says it impinges on the shore opposite that part of Mr. Cross' property 21-B on the east shore, and then is swung back towards the west.

Q.—He says: “It seems to shoot towards the easterly side of the river”?

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A.—It shoots towards the easterly side of the river on the top of the rapid, that is to say from E to opposite the point F. The point F is opposite the upper part of Mr. Cross' property on the east shore. Then it is thrown back towards the west, to point C.

Q.—At page 237 Mr. MacRostie says:

10 “ Q.—Excluding your high water conditions, there is a flow down the river and the projection of land at the point F diverts the water across towards 21-B, and it impinges on that side and flows back again approaching Mr. Cross' property at C? ”

That does not indicate, does it, that the water is on the west shore?

A.—It does, in that part of the property which is under consideration, where the development would be made. It means that above that development the water impinges on the east shore, and then it is thrown back on the west shore.

20 The aerial photograph seems to show it flows very evenly on the upper part of the Cross property, then it is diverted down to the west before crossing Cross' property line.

Q.—Mr. MacRostie also says (page 238) that the rock generally tips towards the upstream side, and adjacent to the submerged rock there is apparently a piece of this ledge broken through which most of the swift water goes, and as you approach the east bank this ledge appears again along with a number of boulders and large rocks. This might explain the presence of stranded logs on those boulders.

30 A.—Yes, and it would explain why the water is thrown to the west shore.

Q.—And, thrown back afterwards to the east shore?

A.—No. He said the water is thrown on the east shore above the drop, and as you come to the drop it is thrown back again towards the west shore.

Q.—In any event, your figures are based on the assumption that the water flows on the west shore, and not on the east shore?

40 A.—Nearly the totality: and also that the elevations of water given to me by Mr. MacRostie represent a fair average of head for distribution of power between the Cross property and that of the Canada Cement. It is not the lowest elevation of the water on the Cross property. That would give Mr. Cross the full benefit of a head between the elevations given for point C and above and what water may be maintained at Cascades.

Q.—At page 247 Mr. MacRostie was questioned about the 25 feet to which I have already referred, and he was asked:

“ Q.—You say you went out about 25 feet into the river to make this investigation? ”

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A.—I said opposite the ringbolt. I would not say that ringbolt is in a correct position. I simply put it there as a matter of reference.

Q.—You walked out about 25 feet into the river. How wide is the river? 600 feet?

A.—The width between my triangulation stakes showed it was 678 feet at the time."

10 Q.—What tailwater level did you take?

A.—For the sake of this testimony I have taken the tailwater given by Mr. Scovil, which is approximately one foot higher than the elevations given to me by Mr. MacRostie.

Q.—What is the figure?

A.—It varies according to the flow. At what flow?

Counsel: 10,000 feet.

20 A.—305.

Q.—Is it exactly 305?

A.—It is so very close to it that I think you can take it as 305. It may be 305.03. I did not attempt to draft that close, nor could the water be measured that close.

Q.—The water is a very variable factor, is it not?

A.—When you come to second decimal places you have to check a lot of averages before you can get it that close?

30 Q.—In a general way those graphs, especially figures 4, 5, 6 and 7—and I might also say figure 3—are a way of obtaining correspondence between two different points on the river, are they not?

A.—Figure 3 is the actual level of the water in different points of the river for different flows.

Q.—Is it a deduction, or is it actual observation, throughout?

A.—It is the basis I used to arrive at the conclusions I have given. It is the reproduction of Exhibits submitted by Mr. Scovil, and some testimony given by Mr. Simpson. Figure 3 is wholly made up from the Exhibits.

40 Q.—Then let us go back to figure 1. You have a red line indicating the tailwater elevation, 304. Is that in accordance with Mr. Scovil's testimony?

A.—Yes.

Q.—For what flow is that taken?

A.—The elevation taken on the profile of the Quebec Streams Commission for Wakefield is given as 312.27. Those are the figures of the Quebec Streams Commission. If that was the case when this profile was made, the flow in the river would be somewhere around 8,000 cubic feet second, and the elevation of Cross' property would

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be about 304. That is how that figure was taken. The elevation at 10,000 cubic feet second is given as 305.

Q.—Mr. Scovil says (page 190) that the elevation at point C, with a flow of 10,000 feet, would be 305.03, with a gross head of 11.17.

A.—I do not see where the 11.17 comes in at all. He said the elevation of the water at point C, at 10,000 feet, was 305.

Q.—305.03?

10 A.—I have it here 305.03. I cannot plot .03, nor can he measure it on the water.

Q.—On your Exhibit you attribute the figure of 304 to Mr. Scovil?

A.—No. I said when this diagram was made the elevation given for Wakefield on the diagram of the Quebec Streams Commission was 312.27. Elevation 312, on Mr. Scovil's figure, means a flow of about 8,000 cubic feet in the river. At 8,000 cubic feet the elevation of Cross' property at point C is given as 304.

20 Q.—By taking 305 I understand you must take away head of the Canada Cement Company?

A.—No.

Q.—Or by taking 304?

A.—No. 304 is at a lower flow than 305, therefore the river naturally falls in level.

This has nothing to do with the Canada Cement.

30 The figure 305 which I have taken from Mr. Scovil is the elevation that would correspond to the elevation given me by Mr. MacRostie for the tailwater, and instead of taking it a foot lower, as Mr. MacRostie gave it to me, I took the figure given by Mr. Scovil.

Q.—That is 305 at point C?

A.—What he gave as 305 at point C.

Q.—On the west shore of the river?

A.—On the west shore of the river. Wherever that point was taken. In the same way as Mr. MacRostie's figure was given to me, it is not the lowest elevation on that side. I took this figure not to represent the lowest water elevation on the west shore, by some small fraction of a foot that might balance any water going on the east shore.

40 Q.—Do you know what is the level on the east shore opposite Mr. Cross' property?

A.—No.

Q.—You have not taken that into account at all?

A.—No.

Q.—Let us now take figure 3. How do you arrive at the top line curve, Paugan Fall tailrace?

A.—The elevation of the Paugan tailrace was given by Mr.

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Simpson in his cross-examination, for 10,000, 20,000 and 40,000 cubic feet second. Those elevations were plotted, and I drew a curve that would go through them to follow down the curve of Alcove, which is situated directly below.

Q.—You had Mr. Simpson's figures for 10,000 cubic feet second, 20,000 cubic feet second, and 40,000 cubic feet second?

A.—Yes.

Q.—But you had not the figures for any other flow?

A.—No, and I did not need them.

10 Q.—You deduced them?

A.—Yes, and there cannot be any very serious error.

Q.—What is the figure for 10,000?

Witness: Where?

Counsel: In figure 3.

A.—About 324.8.

20 Q.—Was not Mr. Simpson's figure 324.48?

A.—Maybe it is. If it was 324.48 it would make very little difference in the hydraulic compilations. Mr. Scovil gave no elevations for Paugan, that I know of; but Mr. Simpson gave elevations. I may have taken them wrong; but if I did take them wrong to the extent of the difference between .8 and .48, it would make no practical difference in the compilations.

30 The elevation given by Mr. Simpson for 10,000 cubic feet second is 324.48, and if it is not drawn to that on the graph it is because there has been an error in drafting. The calculations have been compiled on the figure of 324.48. To balance that, the elevation at 20,000 cubic feet is shown as 329.8, which should be 330. The difference is so small that the thickness of the line would cover it.

Q.—If you hold Cascades at 319, what would Wakefield be, at 10,000 cubic feet second?

A.—319.2 at Wakefield.

Q.—What would be the elevation at Alcove?

A.—The elevation at Alcove would be .5 of a foot above natural conditions—321.15.

Q.—What would be the natural level at Wakefield?

40 A.—320.7 at Alcove.

Q.—And at Wakefield?

A.—About 312.9.

Q.—At 10,000 cubic feet second?

A.—At 10,000 cubic feet second. You are asking about natural conditions at Wakefield?

Counsel: Yes.

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- A.—That is correct.
- Q.—What is the difference between the natural condition at Wakefield and at Alcove?
- A.—Wakefield is 312.9, and Alcove is 320.9—8 feet.
- Q.—What is the difference, at 10,000 cubic feet second, between those same two points?
- A.—Eight feet.
- Q.—You gave the difference under natural conditions?
- A.—Yes.
- 10 Q.—What would it be at 10,000 cubic feet second?
- A.—That is at 10,000 cubic feet second.
- Q.—What would be the difference if you put your dam to 319?
- A.—It will raise the water at Alcove .5 of a foot.
- Q.—Above natural condition?
- A.—Yes, at Alcove.
- Q.—And what is the difference between Wakefield and Alcove?
- A.—I have just given you the difference. If I bring the water to 319 at Wakefield the elevation at Alcove will be 321.15.
- 20 Q.—What is the natural elevation at Alcove?
- A.—320.7.
- Q.—That means you are raising the level of the water at Wakefield by 7.3 feet above natural?
- A.—I raise the water from 312.8 to 319.
- Q.—That is 7.2 feet?
- A.—Something like that. At 10,000 cubic feet flow.
- Q.—Do you maintain that you could raise the level at that rapid 7 feet, without affecting the level above, or only affecting it half a foot?
- 30 A.—Yes. I show by actual observation it was raised by the Chelsea dam to 318.7, and it only affected it to the extent of about .2 of a foot over natural conditions. By observation it was raised to 318.7, at 10,000 cubic feet flow, and it only affected it to the extent of .2 of a foot at Alcove.
- Q.—That is from figure 8?
- A.—That is from observations.
- Q.—You mean the observations summarized in your Exhibit P-62?
- A.—Yes.
- 40 Q.—You are not referring to any other information?
- A.—That is not included, no. From that.
- Q.—Can you tell me the elevations at Wakefield with the scheme you are outlining, at 10,000, 20,000, 30,000 and 40,000 cubic feet second?
- A.—319.2, at 10,000.
- Q.—Does that allow for slope between Wakefield and Cascades?

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A.—There is .2 of a foot drop between Wakefield and Cascades at 10,000 cubic feet second.

Q.—And at 20,000 cubic feet second?

A.—At 20,000 cubic feet second you can allow your head to drop, because you can make up by the excess water for the power. You can allow your head to drop to 318.8, and the excess water will make up for any loss; 318.8 will give you a 10-foot head.

10 Q.—You figure on dropping your water below Wakefield, so as to provide for the excess water you would otherwise have by using a higher head?

A.—I use the excess water rather than throw it back on Paugan where the Gatineau Power Company might possibly use it.

Q.—And what would be the maximum water level at Cascades?

A.—About 321.2.

Q.—What would you have above there; at Wakefield?

A.—At 60,000 cubic feet second you would have 325.2 at Wakefield.

Q.—What effect would that have at Paugan?

20 A.—At Alcove it would have the effect of raising the water half a foot, and at Paugan it would have the effect of raising the water something under .2 of a foot.

Q.—With a maximum elevation of water at Cascades of 321.2, how much would you have at Wakefield?

A.—At 60,000 cubic feet you would have an elevation of 325.2, roughly, at Wakefield.

Q.—Do you know the natural elevation at Cascades, at 60,000 cubic feet second?

A.—About 317.2.

30 Q.—So you are raising Cascades 4 feet, at the high flow?

A.—Yes.

Q.—And that maximum flow would involve an elevation of 325 at Wakefield?

A.—Yes.

Q.—Do you know the natural level at Wakefield at that flow?

A.—The natural elevation at Wakefield is about 324.3.

Q.—You are raising the level under flood conditions?

40 A.—Yes. Of course, flood conditions do not occur very often, and they will occur less often now than they did before.

Q.—Because of the regulation?

A.—Because of the regulation.

Q.—But you are raising the natural elevation?

A.—Yes. It is not exceptional, because I see the elevation at Wakefield has gone up to nearly 328; of course, that would be under exceptional conditions.

Q.—There is an unobstructed stretch of river between Cascades and Wakefield?

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A.—Practically.

Q.—And above?

A.—You have the Pêche Rapids.

Q.—And you do not provide for them?

A.—Of course I do.

Q.—How?

A.—This elevation requires the raising at Alcove some 6 inches above normal conditions.

10 Q.—And you think that is sufficient?

A.—Yes, it is sufficient.

Q.—You still maintain you cannot assimilate the Pêche Rapids to a submerged weir?

A.—Yes. I have actual conditions to work from, with levels, and so on, which would give me quite accurate figures. It is quite possible you could apply other formulæ to obtain the same results.

Q.—That is, you could obtain the same results with a submerged weir?

20 A.—No, I do not mean that. If you apply formulæ that have been developed for a submerged weir, they might give accurate results. With the figures we have, and the calculations we have, they cannot be very much more than one-tenth out, irrespective of which way you work it.

Q.—You spoke about eddies caused by the velocity of the water?

A.—Yes.

Q.—Under what conditions?

30 A.—When the water flows in the river, any little obstruction such as a twig or a stone creates whirling currents, which are called eddies. If you slow up your current by creating an obstruction you eliminate a lot of those, because you slow down the velocity of your current. At the same time you must use calculations in which you have constants for the different currents, and these are very difficult to measure.

Q.—If you increase the flow of the water in the river will you eliminate your eddies, or will you increase them?

A.—If I raise my head, I decrease my velocity and I reduce my eddies.

Q.—You cannot reduce your eddies without raising your head?

40 A.—I am calculating the effect I will have by raising my head, and I am calculating that on hydraulic conditions that are worse than those we find in actual practice. What I want to convey is that the picture shows conditions worse than they will actually be.

Q.—Have you figured anything in regard to the effect of ice or frazil in that river?

A.—The frazil and ice would be the same as they are now from Paugan. What frazil might be caused by the Pêche Rapid would be practically eliminated.

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Q.—Why?

A.—By practically drowning out the rapid.

Q.—That is with a low flow?

A.—Of course the ice period occurs during low flow period.
During high flows the ice is all gone out of the river, and there is no more frazil.

Q.—You get frazil in the winter months?

A.—During periods of low flow.

Q.—Low flow would be in February?

10 A.—Yes: winter months.

Q.—But, you might get frazil before February?

A.—You might get it at the beginning of the winter, but the high flows occur in spring, when the snow melts and the ice goes out of the river—generally after the ice has gone out of the river.

Q.—Does the ice reduce the slope of the river?

A.—Yes, it does.

Q.—It reduces the head?

A.—It reduces the head for any given flow.

20 Q.—It has a much more serious effect in a low head plant than it has in a high head?

A.—Yes, due to quantities. We are, however, dealing with a plant where you are going to raise the water very much above natural conditions at the first step, and for part you raise it at one end above natural conditions, so that you increase your section of river and thus reduce your friction, because the velocity is reduced by the fact that friction is increased.

30 Q.—Do you think that with your condition, your elevations, and the volume of water you would use, you would have a still water-pond above your works, which would freeze over?

A.—Yes.

Q.—What would be the velocity of the water at, say, 20,000 cubic feet second?

A.—It varies according to the flow. It increases as the flow increases. It would be small at 10,000 cubic feet second, and would increase as the flow increased.

Q.—And, at 60,000 cubic feet second?

A.—You would not get any ice at 60,000 cubic feet second.

Q.—And, at 40,000 cubic feet second?

40 A.—I do not think you would get any ice at all much above 10,000 cubic feet second. I do not think you would get 10,000 cubic feet second until summer conditions occurred.

Q.—Do you figure this water power would be a summer proposition?

A.—No, but it would not make any difference in the other time. The 60,000-foot flow would occur in the spring. The high flows would occur in the spring—generally in the month of May.

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Q.—I assume in your estimates of cost of developing the power you are contemplating you would have a higher dam than the one Mr. Simpson has covered?

A.—No: the same.

Q.—You would cover your increased head and increased flow with the same dam?

A.—Yes. As a matter of fact, the dam might be made a little smaller.

Q.—Why?

10 A.—The flow is not increased. I am simply raising the water, and giving it more area to go by.

Q.—What elevation did Mr. Simpson take into account? He did not take 321?

A.—He has taken up to 323.

Q.—Where?

A.—At Cascades.

Q.—To what Exhibit do you refer?

20 A.—D-99. He has 324 over his wing wall, 322 over his concrete wall, 322 on the floor of the power house.

Q.—The water level is 318?

A.—No: 322 is the power house floor.

Q.—I am speaking of the water level?

A.—The water level at Cascades will not go over 321: that is, under extreme conditions.

Q.—If somebody did not open the flood gates at the proper time you might have two or three feet of water on the power house floor?

A.—That might happen anywhere. If you do not open your gates when the flood water comes you are going to get into trouble.

30 Q.—In any event, you have not provided for any increase in the height of any of those works?

A.—No.

Q.—And, you do not think it is necessary?

A.—No.

Q.—Have you provided for any additional excavation?

A.—Yes.

Q.—Where?

A.—In the intake, and the tailrace.

Q.—How much?

40 A.—The intake excavation and the intake concrete have been increased by 10 per cent, because the depth of the intakes would have to be enlarged. Leaving the height the same, I have lowered the bottom by 10 per cent.

Q.—What is the proportion between that and the amount of power you figure on getting?

A.—I am getting the power at a higher head, so that I do not need so much water. Instead of 5.2 feet, as Mr. Simpson calculates,

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I work on 10 feet.

Q.—And, what do you eliminate in that way?

A.—Any additional excavation beyond the 10 per cent.

Q.—But, the more you lower your head the more you might have to excavate in order to get your net head—to prevent back-water?

10 A.—As I lower my head the section of the river would get smaller, and the velocity would be greater, so that the drop in all the stretches of the river from above to the power house would be very much greater. That is why Mr. Simpson only got 5.2 feet. If instead of operating in that way you operate by raising the head, you increase the section of the river, slow down the current, and reduce the drop very materially.

Q.—Did I understand you to say that the figures you get for cost of developed power, \$121 and \$144, are about the same as the cost of development for the Gatineau Power for their present plant?

20 A.—I did not exactly put it that way, because I have not the figures of the cost of their development of the present plant, and I do not know what they were. All I could get were the official figures published by the Gatineau Power Company as to their bond issue and the amount of power they have connected, and it comes to about \$140 bond issue—not book value. Book value, I think it comes to over \$200 per horsepower connected.

Q.—Do you know if there would be any of the bond issue used to pay for the cost of storage?

A.—It would be very small.

Q.—Can you give me the figures?

30 A.—I understand \$5,000,000 has been used for storage. The total amount involved is, I think, in the neighborhood of Eighty Million Dollars or Ninety Million Dollars.

Q.—\$5,000,000 for the storage?

A.—So I understand.

Q.—I would like to know, if you can tell me, how you arrive at a comparison between the development you would propose to make for Mr. Cross and the Gatineau Power development?

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BY MR. DESSAULLES, K.C.:

40 Q.—At the adjournment yesterday I believe we were discussing the bond issue of the Company Defendant. Will you please tell me where you got your information concerning that bond issue?

A.—I got the information a year ago, or some years ago. I do not exactly remember where I got it. I have no doubt, however, you will recognize the figures. I have not the file in which it is, but if it be necessary I will get it for you. I could have it for this afternoon.

It was taken from some of the prospectuses of the Company.

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Q.—What is the figure you have in mind?

A.—\$140 per horsepower, on bond issue; \$200 per horsepower on the book value. I remember those two figures.

Q.—What was the figure of the bond issue?

A.—I think the installed machinery was 565,000 horsepower.

Q.—The resultant of \$140 per horsepower was prepared by you? It is not given in the prospectus of the Company?

10 A.—I think the power is given. The amount of horsepower installed was given in the prospectus, and it was a matter of division.

Q.—But the division was made by you? It was not given in that way by the Company?

A.—Not by the Company.

Q.—It was prepared by you?

A.—Yes.

If you think it is important, I will get the figures for you.

Q.—I want to test your knowledge.

A.—And my memory.

20 Q.—You divide the figure of the bond issue by the figure of the horsepower generated, and you arrive at \$140?

A.—Divide the bond issue by the horsepower given as such, yes.

Q.—Do you know whether that figure of the horsepower includes transmission?

A.—Yes, it includes transmission; and I know approximately what transmission there is. I know also it includes storage, and I know approximately what that means.

Q.—What is your idea of what the transmission means?

30 A.—There is a transmission as far as the frontier, and there is a transmission from Hawkesbury. Comparing them to the size of the figure of the bond issue, they do not come to such a very large amount.

Q.—What do they come to in dollars, in your estimation?

A.—I cannot tell you in dollars, because I have not worked it out. I know it represents a comparatively small amount compared to the amount expended on the developments.

Q.—But it is transmitted and transformed horsepower, and really the power at the market?

40 A.—No, because the power is sold to the Ontario Hydro-Electric Commission at the frontier, if not at the power house—I think it is at the frontier.

Q.—Do you know that, or are you just surmising it?

A.—If you will allow me to get my file I will be able to give you more detail about it. Perhaps you might postpone your question for the time being, and I will get the information for you.

Q.—And the source of your information?

A.—Yes.

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I have here a prospectus dated June 1st, 1931. The funded debt is given as \$90,138,222 of bonds outstanding.

Q.—And is that the figure you divided by the power produced, to arrive at your figure?

A.—Whether it is the exact figure I had, or whether it was slightly earlier or slightly later I could not say. The bond issue might have been slightly different; I cannot tell you definitely.

Q.—Of course, it includes all the properties?

A.—It includes all the properties.

10 Q.—Paugan and Chelsea?

A.—Paugan, Kipawa, Chelsea and the undeveloped powers you have, and your transmission.

BY MR. KER:

Q.—You are not quite correct in that, Mr. Beaubien.

A.—Then that makes it all the worse.

20 BY MR. DESSAULLES (continuing):

Q.—It included, according to the figures in Exhibit P-56, the present installed generating capacity of 565,519 horsepower, to which is being added 34,000 horsepower. Did you include the 34,000 horsepower?

A.—I do not remember the exact figures.

Q.—Then there was also included 80,000 horsepower at Grand Falls?

30 A.—It was taken off one of those that went out. Whatever was included in that one at that time was taken into account.

Q.—And your contention is it would be a fair comparison to bring together the scheme of development you have prepared for Mr. Cross and the cost of the Gatineau Power Company?

A.—The question I was asked was as to whether something could be put on Mr. Cross' property which would be practicable. In order to make comparison, I just give you an idea by those Statements of the Company you represent that the capital cost is not so very far out per horsepower.

40 Q.—The only thing is you have left out certain debit items, and storage and transmission?

A.—Comparatively a small amount. I have given you just the bond issue; I have not given you the book value. You have \$200 per horsepower on book value.

Q.—How can you say that?

A.—I presume there is capital in that undertaking beyond bonds.

Q.—But you are speaking of the cost, and you do not really

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know what is the cost of the Gatineau Power Company?

A.—I have a very good idea from that of what it must have cost.

Q.—And you think it is \$200?

A.—No, I do not say it is \$200; that is probably somewhat over-estimated. I think there is, however, certainly the amount of the bond issue.

Q.—Is it not a fact the transmission for a small power of the kind you propose for Mr. Cross would be a very large item—much larger than it would be with the Gatineau Power Company?

A.—Not necessarily. It depends entirely upon where your market is.

Q.—Where would you propose selling that power?

A.—Wherever I could.

Q.—At what price?

A.—At the prevailing market price. It is easy to assume that this development would not have been made by the Gatineau Power Company unless there was a market for power. I think I am entitled to assume that. If there is a market for power for one company, there is a market for another.

Q.—And you think there is the same market, and that you could figure on the same cost for a small development as you could for a large one?

Witness: Do you mean the cost of transmission?

Counsel: All cost.

A.—If the transmission is for something that is going to be used not far away, the cost per mile and per horsepower need not be any larger than it is for the Gatineau Power Company.

Q.—Have you given any thought at all to the question of market in this scheme of yours?

A.—In so far as I am convinced there must have been a market.

Q.—For the Gatineau Power Company?

A.—Yes.

Q.—But I mean for the Cross scheme?

A.—I do not see you can differentiate a market for Mr. Cross from a market for the Gatineau Power Company.

Q.—And you think Mr. Cross could do anything the Gatineau Power Company has done? Is that your assumption?

A.—I think the market would have been open to him as well as it was to anyone else.

Q.—Do you admit a small waterpower is much more difficult to develop and much more difficult to sell than a large one?

A.—No, it is not more difficult to develop. That is just what I

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have been trying to show. As far as selling is concerned, I should think it would be easier; it is easier to sell a small amount of power than it is to sell a large amount of power.

Q.—Is it not a fact the Gatineau Power contracts are for large blocks of power?

A.—They have contracts for large blocks of power, yes.

Q.—And the maximum quantity you figure on is 20,000 horsepower?

A.—At 70 per cent.

10 Q.—As possible?

A.—No; I put in 23,800 horsepower machinery.

Q.—You referred to the load factor. Would you mind explaining it to me again?

Witness: You mean what the load factor is?

Counsel: Yes.

20 A.—It is the average load throughout the day, over the maximum load that is required. It is a factor made with a numerator, the average load during the day, over the maximum load in that day; that is to say, 70 per cent would mean you could use 70 per cent of the power during the 24 hours, or you could reduce your power for some hours during the 24 hours and go on 100 per cent at the time of maximum demand.

Q.—The maximum demand is called the peak?

A.—The peak.

30 Q.—How many hours would you figure, in your estimation of 70 per cent, on having your peak?

A.—I would estimate about 2½ to 3 hours. As I understand it you want to come to the question of pondage?

Counsel: Yes.

40 A.—Above the plant there is a reservoir in that five and a half mile stretch of river, which would allow you for certain hours of the day to use more water or sell more power than flows into the river, and then to make up for it at later hours, and that amounts to sufficient water to allow you to sell on the 70 per cent load factor.

Q.—What acreage of pondage have you figured on?

A.—I think it is 470 acres.

Q.—That is the figure given by Mr. Simpson?

A.—I think so. It checked with the figures I had.

Q.—So you are not figuring on any additional pondage?

A.—No.

Q.—How many hours do you figure being able to satisfy your

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peak load with that pondage?

A.—I think two and a half or three hours. Perhaps I might look up my figures and tell you definitely. A one-foot drop of pondage means 23,700,000 cubic feet, and that is equivalent to 6,600 cubic feet second for a period of one hour—which is equivalent to practically 6,600 horsepower for one hour, or 3,300 horsepower for two hours.

Q.—And you figure you would be able to get that power for three hours a day?

10 A.—Yes; but, of course, there is a question of balancing it. That is taking it only at one foot. You might find it advantageous to take it at more than one foot for a certain period of time.

Q.—But then you are drawing on your pond quite heavily?

A.—Yes.

Q.—How long will your pond last?

A.—I would not like to take it down more than two feet.

Q.—If you take it down two feet, you reduce your head?

A.—I reduce my head.

20 Q.—And do you not also reduce it by backwater or tailwater?

A.—No.

Q.—Do you not increase the amount of your tailwater, and decrease your head?

A.—We are now only speaking of our water flow. The increase of tailwater from our water flow would not be appreciable.

Q.—Do you know if the figure of 70 per cent load factor is the figure on which the Gatineau Power Company is operating now?

30 A.—I do not know what they are operating now. I think their contract with the Ontario Hydro-Electric Commission is based on that for price purposes, but I do not know whether their plant is operating on it or not.

Q.—Do you know, as a matter of fact, that they work their peak load for seventeen hours a day?

A.—The Gatineau Power Company has a load of steamboilers, for the pulp and paper industry, to replace coal, and it was stated here in Court they sold power for this purpose at something like \$3.45. Of course, when their demand is not great they make up for it with steam.

40 Q.—Do you know, as a matter of fact, that they do this?

A.—They stated so in Court.

Q.—That they used it when their power was idle?

A.—Yes. That is what brings up their load factor.

Q.—The Shawinigan Company does it too?

A.—Certainly. It is the logical way of doing it.

Q.—But that does not affect their pond?

A.—You asked me if I knew their peak runs for seventeen hours, and I am explaining to you why it lasts seventeen hours.

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Q.—Do you or do you not know that the seventeen hours is figured merely on the Hydro-Electric contract, and not on the steam for boiler purposes or pulp purposes?

A.—I do not know what their load is with the Ontario Hydro-Electric Commission. I may know the terms of the contract, but I do not know what is their actual load.

Q.—Did I understand you to say you could deliver 20,000 horsepower, at 70 per cent load factor, with your proposed installation?

A.—Yes.

10 Q.—What would be the effect of using through the waterwheels 14,000 cubic feet per second, instead of 10,000, during the peak hours, when your head is 14 feet?

A.—If you mean whether it would reduce the efficiency of the waterwheels, my answer is no, it will not.

Q.—How much will it reduce your power?

A.—It will reduce my power according to the time it is required; but that is a variable quantity, depending upon load; you may have a day when it will take it down more than it will on another day. An average of two hours for a peak, if it is an average
20 general public utilities load, is a good long peak.

Q.—Do you think it is a sufficient peak to justify the installation you have there?

A.—Yes.

Q.—And you admit you cannot satisfy any more than that with your power?

A.—I admit the 70 per cent load factor upon which it is based. If I can get 20,000 horsepower at 100 per cent load factor, that would make more than 20,000 at 70 per cent. That is the usual standard
30 method of estimating and calculating on an installation of machinery.

Q.—Did you work out the actual load curve on the 70 per cent basis?

A.—No.

Q.—Can you say what the draw-down is?

A.—The draw-down would be between one foot and two feet.

Q.—Could you do that without a curve?

A.—Yes.

Q.—Approximately?

40 A.—Yes; I can say it without a curve. I am giving it to you approximately, of course.

Q.—I assume all the figures in the report are approximate?

A.—No, you are not correct in that. If you get a figure which is a division of two larger figures, the outside figures may be somewhat approximate, but the actual result, especially if it is a very small amount, is fairly close to actual conditions.

Q.—Reverting to what we were dealing with a few minutes ago:

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the last table in Exhibit P-62 shows 14,000 horsepower, at 14-foot head, and 10,000 cubic feet second?

A.—Yes.

Q.—Is that electrical horsepower?

A.—That is electrical horsepower, at the generators.

Q.—What is the over-all efficiency?

A.—88 per cent.

Q.—Is not that a very high efficiency for a low head plant?

10 A.—It is a very high quality wheel. It is the Caplin wheel, with blades that can be tilted during operations to give the highest efficiency.

Q.—Is it not higher than the Gatineau Power Company gets?

A.—I do not think so.

Q.—Do you agree, or disagree, with Mr. MacRostie in regard to that? At page 145 he gave the following evidence:

“ Q.—What is the loss when you come to convert water horsepower into electric horsepower?

20 A.—It depends on the efficiency of the wheels, and the generating efficiency.

Q.—What does that represent?

A.—The over-all efficiency runs about 75 per cent.

Q.—Depending on the size of the development?

A.—Yes.”

A.—I think Mr. MacRostie must have had in mind the over-all efficiency, something from the water to the consumer, and, of course, you can bring a lot of things into that. If you mean from the water-wheels to the generator, it is too low for the modern plant.

30 Q.—At page 146, Mr. MacRostie was asked:

“ Q.—It would not run as high as 75 per cent efficiency? ”

and he said:

“ A.—I am informed by the manufacturers of the electrical equipment that it would.”

A.—I quite agree with that. It certainly would.

Q.—Mr. MacRostie was also asked:

40 “ Q.—So your estimate is he might run this suggested development of yours at 75 per cent efficiency? ”

and his answer was:

“ A.—Yes.”

You disagree with Mr. MacRostie?

A.—I do not know that he was talking of the same figures and under the same conditions.

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Q.—You would not claim a plant like this would have the same efficiency as the Gatineau Power plant?

A.—Of course, the Gatineau Power plant is not operating with the same type of wheel. The advantage of that wheel is that you can set it for maximum efficiency, and from that you may have variations of load from practically the maximum to a quarter of its load. The Gatineau Power Company would not use that type of wheel, and would not have to use that type of wheel.

10 Q.—In reference to the estimated costs, under the heading of “Miscellaneous” you have

A. (interrupting)—The same amount as Mr. Simpson has taken.

Q.—Do you know what is included in that amount of \$223,900?

A.—No. I took whatever the information was, and I presumed he meant water gauges, and such apparatus—cranes, and things like that.

Q.—You took what suited you, and left out what did not suit you?

20 A.—No, I took off what would be changed, and I left what I thought would not be changed.

Q.—Will you look at Exhibit D-95, and say to what this figure refers?

A.—I did not say it referred to anything. If you tell me it refers to certain specific things, I will take your statement for it. There are a lot of odds and ends about a power house which have to be taken into account in making up estimates. Very often it is not worth while going into detail to know how much, for instance, water gauges and so on are going to cost.

Q.—You have nothing at all for contingencies?

30 A.—Yes, I have. Mr. Simpson has “engineering and contingencies, \$307,000,” and I have \$359,000, or an amount of \$52,000 more than Mr. Simpson had estimated.

Q.—Will you look at Exhibit D-95, and tell me what is comprised in the figure of \$223,900?

A.—It is quite plain. I had this.

Q.—Will you just state what it is?

A.—Booms, and piers, and highway flooding, and railway flooding, and flooding damages.

Q.—What are the items?

40 A.—Booms and piers, \$10,000; highways flooding, \$47,900; railway flooding, \$66,000; flooding damages, \$100,000—a total of \$223,900, which I assumed to be incumbent upon Mr. Cross' projected plant just as much as it was upon the Gatineau Power Company.

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Q.—From what Exhibit are you reading now, Mr. Beaubien?

A.—D-95: and I have accepted that figure as such in the estimate.

BY MR. DESSAULLES (continuing):

Q.—As a matter of fact, you are figuring on having your water level something like three feet higher than Mr. Simpson's figure?

10 A.—Mr. Simpson's figure was, I think, about 5 feet 2 inches in his water wheels at high flow. I bring it up to 10 feet, which is 4 feet 8 inches higher for the high flow period. He goes to 10 feet, and I go to 14 feet, which comes to about 4 feet higher at low flow.

Q.—Do you think this higher flow would necessitate increasing the figure for highway flooding, railway flooding, and flooding damages?

20 A.—No. I understood from the evidence that the railway damages were fixed for an elevation of 325; and this will not bring the water to 325—as a matter of fact, it will not bring the water any higher, practically, than it is carried now.

20 Q.—We have had the advantage of hearing one of the engineers of the Canadian Pacific Railway on this point, and he stated (page 503):

“ If the work causes a flooding of the right of way, before consenting to proceed with this work we would ask the person or Company causing that damage to adjust our grade, that is, raise the railway so that the grade would be at least 5 feet above the highest watermark expected.

30 Q.—Do I understand you to say 5 feet is the minimum?

A.—5 feet is the minimum.”

Do you provide for that 5 feet?

A.—Yes: I provide for working at an elevation of 319, and the elevation at Cascades would go to 321—at floods, 321.

Q.—What is your flood period?

A.—My flood period would probably be non-existent.

Q.—You would make it disappear in the way you suggested, by drawing down?

40 A.—I think it has disappeared by the fact of regulation; but even under conditions of flood as they existed before, you go to elevation 321, which is the highest. 321 is the elevation at which you have been operating that plant for a long time.

If you look at figure 10, which is taken from elevations at Wakefield, you will see the elevation is between 320 and 321 from June, 1928, to April, 1929.

Q.—That is Wakefield?

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A.—Yes. The flow during that period goes above 14,000 cubic feet second as an average only for short periods of time; so, with 14,000 cubic feet second, at 321, would not bring the water to as high an elevation as that.

Q.—May I give you further information on this point, from Mr. Hillman (page 504):

“ Q.—Are you aware of the height of the grade along your railway at that point?

10 A.—I have a rough idea of about how it is, but I have no definite knowledge without referring to the profile.

Q.—Is it to your knowledge that the water level up to 318 did require remedial works on your railway?

A.—Yes, the water level up to 318 would entail flooding some portions of our right-of-way.

Q.—And in that case to what would you ask a promoter to carry your subgrade? To what elevation?

A.—We would ask that the subgrade be raised to elevation 323.

20 Q.—That is the minimum?

A.—Yes ”.

And Mr. Dibblee gave the following evidence (page 512):

“ Q.—Have you made an estimate of what the work necessary on the C.P.R. would cost? That is, presuming the water in the Gatineau was to be raised to 318 at the Cascades?

A.—Yes.

Q.—That is to raise the right-of-way or the subgrade to what elevation?

30 A.—323.

Q.—That is 5 feet above the same level Mr. Hillman spoke of?

A.—Yes ”.

A.—Perhaps I could shorten this by telling you that as I understood Mr. Simpson's testimony he was giving those figures as being the actual cost expended by the Gatineau Power Company for the acquisition of rights and the moving of highways and railways to allow them to operate the plant at 320, which is their present plant at Chelsea. As I would be operating only to about 319, it comes within those figures, and I do not see there can be any change in the cost beyond what was paid by the Company.

40 Q.—Can you refer me to any portion of Mr. Simpson's evidence to that effect?

A.—Of course, I may have erred in my understanding of Mr. Simpson's testimony, but that was the impression I gathered from him, and what I have said is based on that assumption.

Q.—You did not hear the evidence given by Mr. Dibblee and by Mr. Hillman?

A.—I heard the evidence of Mr. Dibblee, and my understanding of it was they were discussing what would have happened, before anything had been done. The work was done; the railway was raised; the highway was raised; the properties were purchased—and the amounts paid have been put in, and I understood Mr. Simpson to give those actual amounts.

10 Q.—At the moment you cannot refer me to any portion of Mr. Simpson's evidence to that effect?

A.—Of course, if I am wrong in my assumption, then those figures would have to be changed.

Q.—At page 515, Mr. Dibblee was asked:

“ Q.—Just what was the amount you found would be required to be expended on that work?

A.—\$66,000.”

20 And that was for 318; not for 320, or 321, or 325.

A.—My understanding is the rights of way had been purchased to 325, and they were raising the water to 325, and the servitudes to 323 or something like that. Mr. MacRostie has been instrumental in dealing with a lot of this, and perhaps he could give you the figures more accurately than I can. I am just giving you the premises upon which I worked. I was just trying to save time.

Q.—I am sorry we cannot take it in that way. I have to go through your work to try to understand its bearing and justification.

30 His Lordship: What did Mr. Simpson say, according to you, Mr. Dessaulles?

Mr. Dessaulles: That if they raised the water over 318 they would have to pay a large additional sum.

His Lordship: Where is that in the evidence?

40 Mr. Dessaulles: It appears in a great many places. It is in the portions of the evidence I have just cited from the testimony of Mr. Dibblee and of Mr. Hillman. They say the work that was done on the C.P.R. right-of-way, and also on the Quebec Highway, covers

His Lordship (interrupting): I am speaking of Mr. Simpson's testimony, because I understand Mr. Beaubien is basing himself on Mr. Simpson's evidence on those points. Where do you find what you say in Mr. Simpson's evidence?

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Mr. Dessaulles: I am not saying there is anything. I am asking Mr. Beaubien to justify what he says.

His Lordship: Then you cannot state where it is?

Mr. Dessaulles: At page 279 Mr. Simpson said: "I have an estimate prepared showing 3,800 second feet holding the water at the Pêche Rapids at elevation 318".

10 Witness: There are a number of estimates made by Mr. Simpson. The one upon which I based myself was scheme 3-D, and it did not refer to 3,800 cubic feet; it referred to 10,000 cubic feet.

Mr. Dessaulles: At page 280 Mr. Simpson said: "I prepared a further estimate, scheme 3-D, showing 10,000 second feet flow, to hold the water level at the Pêche Rapids at elevation 318".

20 Witness: That does not state his estimate for land damages only covers to 318. I understood he gave actual costs.

BY MR. DESSAULLES:

Q.—Over 318 is shown by Mr. Hillman's evidence?

A.—No, because he could not very well give costs for part of what he has purchased. That would be an estimate. If he gave costs, he must have given costs for the whole.

30 Q.—Can you file the book to which you referred, from which you took your figures in reference to the flows; being the Department of the Interior Book of 1929—referring to pages 178 and 179—to be Exhibit D-122?

A.—Yes.

Q.—I understand the table on page 179 is merely an estimate, and that the table on page 178 represents metered readings. Do you know that?

40 A.—I do not agree with that at all. The Government bodies who keep a record of the flows of rivers establish a measuring point, and they measure very accurately a section of the river, and they measure the flow for each elevation of the water at that point. Then they plot a curve, which they call a rating curve. Occasionally they send men to take metered readings, and they know that the river has not been changed by erosion or deposit in such a way as to affect the readings on the gauge. Those measures are made all the time as a check, so the figures given for flow would not be an estimate; they are actual measurements taken from day to day, which are checked occasionally by metered readings, and corrected if necessary.

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Q.—Will you look at page 179 of this book, and will you please read the footnote into your deposition, and explain it to me?

10 A.—“Ice conditions from December 21st, 1926, to March 11th, 1927” That is to say, there was ice in the river. Under such conditions it is very difficult to read a rating gauge, and the results given by it may be subject to error. So, from December 21st, 1926, during the winter months, to March, 1927, that gauge is not relied upon to the same extent as it is during the summer months. “Backwater on gauge from April 17th. Discharge as given by Paugan gauge”. The measurements given here were taken at Alcove, but in view of the fact there had been a power plant built at Chelsea, and that had raised the water at Alcove at certain flows, and as this caused fluctuation to a certain extent, it rendered the gauge at Alcove uncertain, and they established a gauge at another spot where they got more accurate measurements of the flow.

Q.—Would these words “Backwater at gauge from April 17th” indicate that there is an amount of backwater included in those figures after April 17th, in the figures stated on the page for the flow?

20 A.—No. It means that after April 17th the gauge was not used for measurement of flow. It was probably only used to give the levels, and the flow was measured elsewhere on the river.

Q.—At Paugan?

A.—At Paugan.

Q.—Will you look at page 178, under date June 25th: gauge height, 320.71; discharge, 9,318 second feet, and the note “D is backwater.” If you take the same date, June 25th, on page 179, the figure of flow is given as 10,140 second feet?

A.—Yes.

30 Q.—Does that indicate a difference, through backwater, of some 800 cubic feet per second on that date?

A.—No, it does not. It means those readings given here were usually taken at Alcove for that stretch of the river, but on account of the fact that the gauge at Alcove was thought not to be reliable, they were taken farther upstream. There would be a difference in the flow of the river between those two points under natural conditions. There would probably be tributaries falling into the river, so they would probably take a reference curve, giving the flow from one point to another, and this particular point was in order to convert
40 the readings at Paugan to what they would have been at Alcove if that gauge had been depended upon.

Q.—Those figures are for Alcove, are they not?

A.—For the flow at Alcove. But, the flow at Alcove may be measured at Paugan, and they may have estimated the additional water that came into the Gatineau below the point of measurement, and added it for the flow at Alcove. So, all those records of flow refer back to the same point.

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Q.—So, you assume this to be the corrected flow?

A.—I assume the report to be correct, and I assume the Government engineers know their work and that they would not be doing something which is not right.

Q.—Do you know where they got the information?

A.—I do not know. I am satisfied they got it at the best source. It may be possible it was measured over the dams of the Gatineau Power Company, and that is an element which would make it more certain, rather than less certain, because the figures would probably
10 be checked by the Government engineers, so you would have two authorities checking the figures, rather than one.

Q.—And, as a matter of fact, do you know that later even the Paugan gauge had to be given up?

A.—I understand that the Paugan gauge is immediately below in the river, and it would be left out. Probably the Paugan dam and the Paugan sluiceways and the Paugan machinery were used. The fluctuations in load at the Paugan plant would cause variations in the river flow, because of the sudden opening of the gates to meet
20 the demand, and this would render the reading of the gauge in the river at that spot very difficult, even more so than it would be at Ottawa.

Q.—Have you seen rating table at Paugan?

A.—No. I have taken the figures for my flows from the figures published by the Government. I have not gone beyond that.

Perhaps I might add that those readings of flow were converted to read at Alcove, and if there has been any error it has been very consistent because the curve goes very uniformly as the flow increases above natural conditions, and it follows exactly the same curve.

Q.—For the three months?

A.—For the 150 readings or so, that were taken—five months.
30

RE-EXAMINED BY MR. ST. LAURENT, K.C.,
OF COUNSEL FOR PLAINTIFF:

Q.—Looking at figure 10 of Exhibit P-62 I have been considerably puzzled to understand what was meant by the solid graph, and what was meant by the dotted graph. Would you mind explaining it?

A.—The solid graph refers to the elevations of the water at
40 Wakefield. The dotted line refers to the flow in cubic feet per second at Alcove.

Q.—So, the dotted line should be referred to the figures of from 4,000 to 38,000, marked " Flow in CFS " ?

A.—Yes.

Q.—And the solid line should be referred to the figures from 310 to 328, on the extreme left of the graph, marked " Elevation " ?

A.—Yes.

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Q.—What did the cross-sectioning of the river at the Pêche Rapid reveal as to the possibility, or otherwise, of improving the conditions of backwater by work there?

A.—Studying the elevations and figures submitted by Mr. Scovil, I was convinced that something could be done at the Pêche Rapids that would improve the hydraulic conditions. I made a special trip with Mr. Robertson and Mr. MacRostie to the Pêche Rapids, and examined them thoroughly. At the Pêche Rapids there are a large number of boulders, and a large quantity of gravel, and probably some solid rock the extent of which it has been impossible to ascertain. I know with a very small expenditure at the Pêche you could make a very substantial difference on the elevations above the Pêche, so that if perchance in making a development such as this we should find there is some error in the calculations, there is always the security that by doing a little work on the Pêche you could completely obviate any disadvantage that might be caused.

Q.—That work would consist of removing the things which cause friction and which interfere with the flow?

A.—And restrict the passage of the water at the top of the Pêche Rapids. That would make pretty sure of not affecting Pagan in any way.

Q.—Even as it is does the Pêche Rapids operate in any way as a submerged weir?

A.—No, it does not.

Q.—How were you able to ascertain that?

A.—A submerged weir depends for its operation on conditions above it. It is based on the knowledge obtained from overflow of dams—water flowing freely, or water flowing through submerged orifices which encounter any obstruction. There is an obstruction in the Pêche Rapids, and the water flows over the obstruction on an apron of rock and boulders, and it tumbles down for a distance that is a variable element and which offers a resistance to the flow. If we use the formula based on a submerged weir we would have to base it on conditions above the restricted area, and not at all around the restricted area. But, whether it be taken for 100 feet or 1,200 feet, it represents your formula and your constants would remain the same. It is not applicable at all.

BY MR. DESSAULLES:

Q.—Have you made any estimate of the cost of removing those boulders, or doing away with the Pêche Rapids.

A.—No.

I think probably a foot or a foot and a half could be gained at the Pêche without any very serious expenditure. I am convinced of that by looking at it.

I did not go into it in my testimony in chief, because it depends

Re-cross-
examination

40

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on what is rock and what is not rock, and that requires soundings which, of course, I could not make.

Q.—Would you give the engineers of the Gatineau Power Company credit for having looked into that?

A.—Of course there might be other considerations that would prevent them from going into it now.

Q.—I mean, at the time.

A.—Perhaps they were convinced there would not be an obstruction.

10 Q.—In any event, you did not prepare any figures on it?

A.—I know the Gatineau Power Company must have calculated on an elevation of 320 at Chelsea, because they have it at their plant. If they did that they must have counted on surmounting the difficulty of the Pêche Rapids.

BY MR. KER:

Q.—The scheme which you propose would include the flooding out of the Pêche Rapids?

A.—Partly, yes.

20 Q.—You might perhaps be able to do some excavation work which might allow you to raise the head higher at the Pêche Rapids?

A.—Below the Pêche Rapids.

Q.—What would you do if the owner of the Pêche Rapids took the same attitude towards your work as Mr. Cross is taking towards the Company's work?

A.—I am assuming that Mr. Cross could take the Pêche Rapids, as it has been taken probably by the Company since the water has been raised.

30 Q.—He could take it in the same way you believe the Company is justified in taking his rapid?

A.—The Company has taken his.

Q.—But you must be consistent.

A.—I do not think I should put them on the same basis, because you have only a possibility of 6 or 7 feet at the Pêche, whereas you have a possibility of 14 feet at Mr. Cross' property, which makes a very different story on a water development.

BY MR. DESSAULLES:

40 Q.—On principle?

A.—On facts.

(And further deponent saith not.)

DEPOSITION OF WALLACE BROOKS, A WITNESS EXAM-
INED ON BEHALF OF THE PLAINTIFF IN REBUTTAL.

On this twelfth day of January, in the year of our Lord one thousand nine hundred and thirty-two, personally came and appeared

WALLACE BROOKS,

10

of the Village of Wakefield, in the Province of Quebec, clerk, aged 45 years, a witness produced and examined on behalf of the plaintiff in rebuttal, who, being duly sworn, deposes as follows:

EXAMINED BY MR. ST. LAURENT, K.C.,
OF COUNSEL FOR PLAINTIFF:

20 Q.—I understand in the spring of 1927 you were in charge of reading gauges for the Gatineau Power Company at Wakefield?

A.—Yes.

Q.—You were heard as a witness in the case of the Gatineau Power Company vs. Hendricks?

A.—Yes.

Q.—And your notebooks were filed as exhibits?

A.—Yes.

Q.—I understand from the evidence you gave that those records were transmitted regularly and periodically to Mr. Woodside?

A.—Yes.

30 Q.—And Mr. Woodside filed a compilation of the readings?

A.—Yes.

Q.—I understand you never got your books back?

A.—No.

Q.—Was the information which was supplied at that time in the Hendricks case in accordance with the readings you personally had made on the gauge?

A.—Yes.

Q.—Mr. Woodside was one of the engineers of the Gatineau Company, under whose control you were doing this?

40 A.—Yes.

(Mr. Ker, of counsel for defendant, declares he has no cross-examination to make of the witness.)

(And further deponent saith not.)

DEPOSITION OF JAMES WOODSIDE, A WITNESS EXAMINED ON BEHALF OF THE PLAINTIFF IN REBUTTAL.

On this twelfth day of January, in the year of our Lord one thousand nine hundred and thirty-two, personally came and appeared

JAMES WOODSIDE.

of the City of Ottawa, in the Province of Ontario, engineer, aged 40
10 years, a witness produced and examined on behalf of the plaintiff in
rebuttal, who, being duly sworn, deposes as follows:

EXAMINED BY MR. ST. LAURENT, K.C.,
OF COUNSEL FOR PLAINTIFF:

Q.—I understand that from April to September, 1927, you were
one of the engineers in the employ of the Gatineau Power Company?

A.—Yes.

Q.—And as such you had under your control Mr. Wallace
20 Brooks, who was reading gauges for you at Wakefield?

A.—Yes.

Q.—That is the Mr. Brooks who has just given testimony here?

A.—Yes.

Q.—Mr. Brooks' notes, and your own compilation of those notes,
were filed in the Hendricks case, were they not?

A.—The gauge readings at Wakefield, which Mr. Brooks kept,
were put in as exhibits in that case.

Q.—And also a compilation, or a table, made by you, of the ele-
30 vations, prepared by adding the elevation of the zero to the gauge
reading?

A.—Yes, at Wakefield. To the best of my knowledge those were
put in. Of course, it is nearly two years ago, but as far as I recollect
they were put in.

Q.—It would appear from a reading of your testimony that they
were put in. In any event, whatever you did put in was correct?

A.—To the best of my knowledge, yes.

Q.—Those exhibits, which were filed as D-2, D-3 and D-5, were
withdrawn from the record on March 4th, 1931, by Messrs. Ste.
Marie & Ste. Marie, who informed us they were returned to the
40 Company. Have you got them?

A.—I have no knowledge of that. No.

Q.—You did not get them?

A.—No.

(Mr. Ker, K.C., of counsel for defendant, declares he has no
cross-examination to make of the witness.)

(And further deponent saith not.)

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N. B. MacRostie,
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DEPOSITION OF NORMAN B. MACROSTIE, A WITNESS
EXAMINED ON BEHALF OF PLAINTIFF IN REBUTTAL

On this twelfth day of January, in the year of Our Lord one thousand nine hundred and thirty-two, personally came and appeared

10 NORMAN B. MACROSTIE,

already sworn, who, being now called as a witness on behalf of the Plaintiff in rebuttal, deposes as follows:

EXAMINED BY MR. ST. LAURENT, K.C.,
OF COUNSEL FOR PLAINTIFF:

Q.—You have already been sworn, and have given testimony in this case?

20 A.—I have.

Q.—You have Mr. Beaubien's Exhibit P-62 before you?

A.—Yes.

Q.—Will you please look at the tabulation which follows figure 7, and will you say who gave Mr. Beaubien the elevations at Alcove and Wakefield which form part of that tabulation?

A.—The elevations both at Wakefield and at Alcove were submitted to Mr. Beaubien by me.

Q.—Did you give him the flows?

A.—No, he took them from his own record.

30 Q.—Where did you get the elevations for Alcove?

A.—I got the elevations at Alcove from the records in the Department of the Interior at Ottawa. I copied them from the records on their files.

Q.—Did you personally take any of the elevations at Wakefield?

A.—I had taken a number of them myself, but I had not continuous readings from day to day.

Q.—Have you your field books here?

40 A.—I have one of them, with some of the elevations. I have not them all.

Q.—I mean for this period from May 1st to September 1st?

A.—Yes.

Q.—Where did you get the flows for each day?

A.—I was in Court when the case of Hendricks vs. the Gatineau Power Company was heard. The continuous records were filed, and I secured them from the Court files and made a copy of them; and this is the copy.

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Q.—Did you check it with your own readings?

A.—Yes. I have my book here giving a number of days.

Q.—How did they compare with your own readings?

A.—Substantially the same.

Q.—Had you taken them at various elevations?

A.—Yes, various elevations and various flows.

Q.—As an engineer, what conclusion did you form as to the accuracy, or otherwise, of the tabulation that was submitted in the Hendricks case?

10 A.—I have no reason to doubt their accuracy; in fact, I would say they were accurate.

Q.—After checking them yourself in such a manner that you were convinced as an engineer they were accurate?

A.—Yes.

Cross-examination

CROSS-EXAMINED BY MR. KER, K.C.,
OF COUNSEL FOR DEFENDANT:

20 Q.—Who prepared those tabulations produced in the Hendricks case?

A.—You have heard the evidence of Mr. Brooks and the evidence of Mr. Woodside.

Q.—Those elevations which you supplied to Mr. Beaubien were copied by you from an Exhibit which was produced in Court in another case?

A.—Yes.

Q.—Which levels were taken by Mr. Brooks?

A.—Yes.

30 Q.—Was Mr. Brooks a witness in that case?

A.—Yes.

Q.—Have you the actual copy with you?

A.—No. I have tried to get it, but it has been taken off the file. I have my own copy, taken from the Court Exhibit.

Q.—Have those levels to which you have referred here, and to which Mr. Beaubien has referred, been discussed by any of the Defendant's witnesses? Is any part of the Defendant's case based upon those levels?

40 Witness: Do you mean this case?

Counsel: Yes.

A.—I do not know whether they have or not.

Q.—As a matter of fact, those levels, and your evidence now as to them, and the evidence of Mr. Beaubien, are really designed to build up a different system of horsepower?

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A.—No.

Q.—Upon different levels, which have not been referred to before?

A.—No. You misunderstand me. Isolated cases of these have been referred to throughout this case; the elevations at Wakefield have been referred to. As a matter of fact, if you compare those with Mr. Scovil's Exhibit D-81 you will find the first part of that Exhibit will correspond to conditions before the water was raised.

10 Q.—In fact, practically all the data you have produced here corresponds with the data that was produced by the Company?

A.—All the data that I checked myself.

Q.—You found to be correct?

A.—I found to be correct. Not only in this case, but in every other case I endeavored to check the information, and if I found no reason to doubt it, I used it.

Q.—And, you have found no reason to doubt it?

A.—In some instances I might agree with the information, and I might not agree with the evidence.

20 Q.—You have no reason to dispute the information as to the levels, and so on, given by the different witnesses? In any event, you say that those elevations have not been referred to in this case by the Defendant?

A.—I did have them in a number of instances, but not as a tabulation day after day.

Q.—In every case in which they have been referred to you found them to be correct?

A.—Yes.

Q.—Therefore, you are not trying to dispute those elevations?

30 A.—No.

Q.—Just what is the purport of your evidence this morning?

A.—The purport of the evidence is to show the varying elevation at Wakefield for the period from April to September, 1927, and its relation to the gauge at Alcove. As a matter of fact, I have had this information for a number of years, and have been using it.

Q.—Then, the object of your evidence is not to dispute any fact which has been brought forward by the Defendant?

A.—No: it is for the purpose stated.

40 Q.—Have you noticed Mr. Scovil's figures are based on 1926, not on 1927?

A.—What he had here were the ones before the water was raised. The elevations taken by Mr. Brooks include the period before and after.

And further deponent saith not.

Mr. Scott: Before closing the Plaintiff's case I would like to put a statement of Record with reference to Exhibit P-55, which is

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(continued)

the first prospectus issued by the Company.

In considering the case your Lordship will no doubt see on the prospectus the following paragraph:

10 “Legal matters in connection with the Trust Deed and the initial issue of bonds thereunder are to be passed upon for the bankers by Messrs. Rushmore, Bisbee and Stern, New York, and Messrs. Lafleur, Macdougall, Macfarlane & Barclay, Montreal; and for the Company by Messrs. Davis, Polk, Wardwell, Gardner & Ree, New York, and Messrs. Brown, Montgomery & McMichael, Montreal.”

20 The statement I wish to make is this: my partner, Mr. Macfarlane, was called upon by the firm of Rushmore, Bisbee & Stern (who were acting for the bankers selling those bonds) to pass upon the legality of the Trust Deed as to its form and sufficiency under the Quebec Law, and a certain report upon the title. After Mr. Macfarlane had started the work it was found that the late Mr. Lafleur, who was then in England, had been for some time advising
20 Mr. Cross, and Mr. Macfarlane immediately communicated with Messrs. Rushmore, Bisbee & Stern and with Messrs. Brown, Montgomery & McMichael, to the effect that they would have to take the opinion of independent Counsel in regard to Mr. Cross' claim and contentions, and that we would not make any report or have anything to do with passing on Cross' claim or contentions.

30 This was done, but inasmuch as our name appears on the prospectus, and perhaps the question might come up in some other Court as to how it appears, I think it proper to make this explanation.

 Mr. St. Laurent: Of course, in closing our case we wish to reserve the right to certify any copies which we may have been using as Exhibits and which may not have been certified. We would like the privilege of putting the authentic certificates upon such unauthenticated copies as we may have been using as exhibits. Of course, our friends for the Defence will have the same privilege.

**DEFENDANT'S EVIDENCE
IN SUR-REBUTTAL**

*In the
Superior Court*

No. 50.
Defendant's
Evidence.
In Sur-Rebuttal
C. N. Simpson,
Examination
Jan. 12th, 1932.

DEPOSITION OF CARROLL N. SIMPSON, A WITNESS
EXAMINED ON BEHALF OF THE DEFENDANT
IN SUR-REBUTTAL

On this twelfth day of January, in the year of Our Lord one thousand nine hundred and thirty-two, personally came and appeared

10

CARROLL N. SIMPSON,

already sworn, who being called as a witness on behalf of the Defendant in sur-rebuttal, deposes as follows:

EXAMINED BY MR. KER, K.C.,
OF COUNSEL FOR DEFENDANT:

20 Q.—Referring to the report which has been filed by Mr. Beaubien, have you had occasion to examine the tabulation of elevations and flows obtained from the Department of the Interior, which are said to be based upon gauge readings at Alcove and Wakefield—that is, the tabulation following figure 7?

A.—Yes.

Q.—Will you please state your opinion as to whether the deductions which Mr. Beaubien has drawn from those figures are correct in respect to those gauge readings?

30 A.—I do not believe it is possible to arrive at the conclusions at which Mr. Beaubien has arrived by using the figures in this tabulation.

Q.—What is your reason for saying that?

A.—The figures in this tabulation are arrived at in an indirect way, using the rating curve of the Paugan tailrace gauge before the plant was constructed.

Q.—Is that the Alcove gauge?

40 A.—No; it is twelve or fifteen miles above Alcove, at Paugan. The reason the Paugan tailrace rating gauge was used was that after about April 17th the backwater effect of the Chelsea pond made the Alcove gauge readings useless for flow rating. The next best method of calculating the flow was at the tailrace gauge at Paugan. The tailrace gauge at Paugan, in our opinion, was also affected by the backwater from the Chelsea pond, but at that time we had not estimated the effect of the backwater, and we, therefore, did not put it into our calculations for the flow.

Those flows are on the basis that there will be no backwater effect at Paugan from the Chelsea pond.

Q.—Those figures are based on that?

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A.—Yes.

We took our Paugan tailrace gauge readings and deduced the flow from those gauge readings, and sent them to the Water Power Branch of the Government. Those figures of flow correspond exactly with the figure which we supplied to the Government as being the flow during this period. I do not believe they are sufficiently accurate for Mr. Beaubien's use in this manner.

10 Q.—As a matter of fact, the Government found they could not rely on the Alcove gauge readings after the backwater effect of Chelsea was established?

A.—Yes.

Q.—And this report, based upon those readings, which were found to be unreliable by the Government, are based on a reading of that gauge?

20 A.—No. Those readings of the Alcove gauge are taken by the Government gauge readers. The figures of flow are figures supplied to the Government by the Gatineau Power Company, and are not based on the Alcove gauge; they are based on the Paugan tailrace gauge, which is affected by the backwater from Chelsea.

Q.—So the correlation is erroneous?

A.—Yes.

Mr. Beaubien is also assuming that those flows are correct, and finding what difference in backwater there has been at Alcove under two different conditions. To begin with, those flows are not correct; therefore, his assumption as to the amount of backwater caused at Alcove is not correct.

30 Q.—He has based himself further, I believe, upon the fact (as he states) that the totality of the water at the Cascades runs down the west side?

(Mr. St. Laurent, K.C., of Counsel for Plaintiff, objects to the question as not containing a correct statement of fact, and upon the further ground that this is not proper sur-rebuttal, the Defendant's evidence on its plea having covered the point.)

(The question is withdrawn.)

40 Witness: I stated Alcove gauge was affected after April 17th. As a matter of fact, it was affected after April 16th; it was affected on April 17th.

BY MR. KER (continuing):

Q.—What was the highest level at Chelsea prior to that time?

A.—It was below 317.

Q.—That would indicate the Department computed that above 317 backwater would affect Alcove?

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A.—Yes.

Q.—If I remember Mr. Beaubien's evidence correctly, he was of opinion that up to 318, and even higher, it could not affect Alcove?

A.—That is in the evidence.

Q.—Do you think it is a sound assumption?

A.—No, I do not.

Q.—Your estimates of cost are referred to in Mr. Beaubien's report?

A.—Yes.

10 Q.—On what head at Cascades were they based?

(Mr. St. Laurent, K.C., of Counsel for Plaintiff, objects to the question as not being a proper matter of sur-rebuttal.)

(The question is withdrawn.)

20 Q.—Mr. Beaubien spoke of operating this proposed plant on a 70 per cent load factor by drawing down his pond. From a scientific point of view, do you consider that to be possible?

A.—It is possible, but it is not economical.

Q.—Because it is begging the head in order to get the pondage?

30 A.—On the basis on which we sell our 70 per cent load factor, power we require a peak over approximately 17 hours a day, and off peak about 7 hours a day. That would require an outflow from the plant of 14,000 cubic feet a second for 17 hours a day, which is an excess outflow over inflow of 4,000 cubic feet a second for 17 hours. That would amount to approximately two hundred and fifty million cubic feet. There are approximately 25,000,000 cubic feet per foot in Mr. Cross' head pond, therefore he would have to draw his pond down 10 feet in one day in order to use 70 per cent load factor.

BY MR. ST. LAURENT:

Q.—For 17 hours?

40 A.—That is the basis of the 70 per cent load factor power which the Gatineau Power Company sells. If he is comparing his 70 per cent development with the Gatineau development on a 70 per cent basis, he would require to draw his pond 10 feet, which would draw the power completely—he would have nothing left.

BY MR. KER (continuing):

Q.—He would have no head left?

A.—No head whatever. So it is impossible to operate Mr. Cross' property at 70 per cent on the same basis as the Gatineau developments are operated and the power sold at 70 per cent.

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Q.—I think Mr. Beaubien stated he proposed to operate on a 70 per cent load factor by drawing down on a peak of approximately two hours a day. Is that any basis of a 70 per cent load factor?

A.—No, absolutely not.

CROSS-EXAMINED BY MR. ST. LAURENT, K.C.,
OF COUNSEL FOR PLAINTIFF:

Cross-examination

10 Q.—You note, do you not, from Exhibit D-122, it is stated that the river was metered on May 2nd, June 20th, June 23rd, June 25th, and June 27th?

A.—Yes.

Q.—The figures used for flow in Mr. Beaubien's Exhibit P-62 are the figures published as the flow in Exhibit D-122?

A.—Not the metered figures for flow.

Q.—But they are the figures published for flow?

A.—There are two figures published for flow: one metered figure for flow, and another figure for flow.

20 Q.—You are not saying his exhibit does not accord with the flows published at page 179 of Exhibit D-122?

A.—They do accord with it.

Q.—And those flows published at page 179 were supplied to the Water Power Department by the Gatineau Power Company?

A.—Yes.

Q.—You are not saying that the elevations at Alcove were not the actual elevations taken by the Government observers?

A.—They were, as far as I know.

30 Q.—So the only question you are raising would result from your present statement that the flows supplied to the Government by your Company, and published in the Official Books by the Government, should now be considered as incorrect?

A.—That is what I intend to imply.

Q.—There is still a substantial portion of the power developed by the Gatineau Power Company sold for conversion into steam?

Witness: What do you mean by a substantial portion?

40 Counsel: There still is a lot of power that is converted into steam?

A.—I gave the figures in my testimony in chief.

Q.—20 per cent, 25 per cent or 30 per cent?

A.—At the present time there is approximately 100,000 horsepower, 70 per cent load factor. That is just approximately.

Q.—And for the power sold and used for purposes other than steam you still have a substantial margin between your installed capacity and your deliveries?

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A.—We have the margin which we are using for steam. The margin between the power we are selling other than for steam, and for steam, is variable? We can cut the steam off, for supplying other power purposes.

Q.—Up to the present time your contracts for power for other than steam purposes do not overtax your capacity?

A.—No.

Q.—If you had a plant that was capable of producing 14,000 horsepower at 100 per cent load factor, and you operated it at 70 per cent per day load factor, you would get, would you not, approximately 20,000 horsepower, with the same quantity of water, over the 24 hours?

A.—I cannot answer that question directly. I would have to make a number of qualifications. In a general way, however, I would say it is substantially correct.

Q.—And if you were operating at 100 per cent load factor, you would be using each minute or each hour of the day a quantity equivalent to the quantity coming in, whereas if you were operating on a 90 per cent, or 80 per cent, or 70 per cent load factor, at some periods of the day you would be using more than was coming in, and at other periods you would be using less than was coming in?

A.—Yes, but it is subject to local conditions which might not apply to any one particular plant. In a general way, on the average plant, that is substantially correct.

BY MR. KER:

Q.—Mr. Beaubien has stated that utilizing your figures for dam construction he would be able to hold his head pond at Cascades between 321 and 322. He said: "I would use the excess water, rather than throw it back on Paugan where the Gatineau Power Company might possibly use it." He was asked "What would be the maximum water level at Cascades?" and he said, "321.2".

Could that possibly be done with the dam construction figures you have given?

A.—In my original estimate I figured on holding the water at 318, and estimated on the top of the dam at 322. Under those conditions the quantity of concrete in the dam was barely sufficient to hold back the pressure of the water, and in raising the water to 321, as considered by Mr. Beaubien, I do not consider the dam would be safe. I would think the dam should be raised in proportion to the raising of the water.

Q.—And at proportionate cost?

A.—The cost would be higher than in straight proportion to the additional amount of the raise.

Q.—You would not, then, advise Mr. Beaubien basing himself

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on the cost of a dam such as yours for the development he would propose?

A.—No, not at all.

Q.—Why should the cost run proportionately higher?

A.—The downstream face of the dam slopes so that if the top of the dam is 10 feet the bottom is 20. If we raise that dam three feet, the top of the dam is still 10 feet, but the bottom of the dam will be 26 feet. and we have to add this quantity of concrete at the bottom of the dam, not at the top of the dam.

10 You might say, in a general way, the cost of a dam increases proportionately to the square of the height; but that is only a very rough estimate.

Q.—So, on the basis of it varying as the square of the height, a dam 20 feet high would cost four times as much as one ten feet high?

A.—Yes.

Q.—I think Mr. Beaubien stated the figures for highway, railway and flooding were what the Company had actually spent. What have you to say as to that?

20 A.—No, that is not so. That is an estimated amount it would cost for flooding damages holding the water at Cascades at elevation 318.

Q.—It is not what the Company actually spent?

A.—No, it is an estimated amount.

Q.—For holding the water at Cascades for a development based on an elevation of 318?

A.—Yes.

BY MR. ST. LAURENT:

30 Q.—You had estimated on a dam to elevation 322?

A.—That is the top of the dam.

Q.—You did not anticipate that if water ever went to elevation 322 it would overturn the dam?

A.—I would not advise anyone to put that dam in there the way I designed it.

Q.—As an engineer you were not designing a dam that was going to be overturned if the water went up to the top of it?

40 A.—That dam might be overturned with the water at 322. It might be overturned with the water at 318.

In my evidence I pointed out that was the absolute minimum section that I could possibly justify, and I would not advise anyone to build that dam on the basis I designed it.

Q.—As a matter of fact, you would not advise Mr. Cross, or anyone else, to develop any property your Company wanted to develop, would you?

A.—I do not think I have to answer that.

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Q.—You are the engineer in full time service of the Gatineau Power Company?

A.—Yes.

BY THE COURT:

Q.—If the Gatineau Power Company had not made any works on that part of the river, what power could Mr. Cross have derived from the water he had above him?

10

Witness: Do you mean at Chelsea?

His Lordship: On his property. You know the property he has now.

A.—You say on that part of the river; do you mean at Chelsea, or both at Chelsea and at Paugan?

His Lordship: I understand it was the raising of the water that deprived Mr. Cross of all the power to which he thought he had a right?

20

A.—Yes.

Q.—If those works had not been carried out at Chelsea, what power could he have derived from his property?

A.—That is shown in my estimate 2-B. I estimate the amount of power would be 8,020 horsepower, utilizing 10,000 cubic feet per second flow in the river. That appears in my estimate 2-B, and assumes raising the water level at Cascades to elevation 316.2, and to 316.9 at the foot of the Pêche Rapids. That is without affecting the Paugan plant. That allows Mr. Cross to take the water up on the Pêche Rapids, but without affecting the Paugan plant.

30

BY MR. ST. LAURENT:

Q.—The 316.9 is a figure comparable to the figures Mr. Beaubien worked out on his backwater. You are not disputing the mathematical calculations Mr. Beaubien made: you are taking it that 316.9 is the highest point to which water could be backed at Wakefield without affecting Paugan?

A.—Yes.

Q.—You are not disputing that if his hydraulic calculations are correct, his mathematical calculations are correct in using 14,000 horsepower at 100 per cent load factor, and 20,000 horsepower at 70 per cent load factor?

40

A.—I have not checked those figures in detail. The 14,000 horsepower has been estimated by Mr. Beaubien on the basis of a 14-foot head, 10,000 cubic feet second, and 88 per cent efficiency—which gives him 14,000 horsepower.

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Q.—That would be correct, if his premises are correct?

A.—If his premises are correct, the 14,000 horsepower would be correct.

Q.—So, the question as to whether it is 14,000 at 100 per cent, or 8,020 at 100 per cent, turns on whether you can back to 316.9 or to the point Mr. Beaubien finds by his calculations?

A.—There is also a difference in the tailwater elevation, 1.3.

Q.—You take off the 1.3, according to Mr. Scovil's calculations?

A.—I have used Mr. Scovil's calculations, and added 1.3 to the
10 elevation to give me what I figure as Mr. Cross' tailrace.

Q.—That would be the average water across the whole width of the river?

A.—Yes.

Q.—So that between you engineers the difference is really in the data you use, because you all use the same methods of calculation to arrive at the results?

A.—Yes.

That 8,020 horsepower is a power available at the low tension of Mr. Cross' plant, and is not the power that would be available
20 for sale in Hull. If the transformation and transmission losses are deducted, there would be less power than that available in Hull.

Q.—That is on the 100 per cent load factor?

A.—That is 100 per cent load factor.

Q.—And, it would be something between 11,000 and 12,000 horsepower at the 70 per cent load factor?

A.—My idea is Mr. Cross could get more power out of his plant at 100 per cent load factor than at any other load factor.

Q.—That, again, is a matter of your opinion as an engineer?

A.—Not my opinion as an engineer: my calculations as an
30 engineer.

Q.—But, with respect to mathematical calculations, 8,020 horsepower at 100 per cent load factor is the equivalent of something between 11,000 and 12,000 horsepower at 70 per cent load factor?

A.—Subject to a number of qualifications.

BY MR. KER:

Q.—I understood His Lordship to ask you what power would be available from Mr. Cross' own property, and I understood you to
40 say that the power available without affecting Paugan was 8,020. I would like the record to be clear on the fact that that answer does not include only the power which is on Mr. Cross' property, but includes the power on all the properties up to the Pêche, and affecting the tailwater at Paugan?

A.—I may not have made that altogether clear. It assumes Mr. Cross would be entitled to develop all the power from his property right up to the Pêche.

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Q.—Following the same thought, perhaps you might say what power he could develop if he was only entitled to develop the amount of head actually within the four corners of his property?

A.—That has already been put in. There are two or three assumptions on which we might base that amount of power.

On the basis of Mr. Cross owning a certain section of that property, it would be a very small amount of power. On the basis that he could drown out the property which we claim at one time belonged to the C.P.R., and now belongs to us, he could get a good deal
10 more.

BY THE COURT:

Q.—My question was if the works at Chelsea had not been carried out by your Company, what power would Mr. Cross derive from his property—his possessions?

A.—I did not give it to you altogether correctly, then.

Q.—You gave it to me, going as far as Paugan.

A.—At the present time Mr. Cross does not possess enough
20 property to obtain that amount of power. One of my other estimates will show the amount of power he could develop on the property which he owns now.

I think I stated I had not made any calculation of the amount of power available right on Mr. Cross' own property, but my statement 1-B (Exhibit D-89) shows the amount of power he could develop by including the rapids in front of the C.P.R. property. This involves a stretch of river possibly half a mile long upstream from the lowest point of Mr. Cross' property. In that stretch there
30 would have been 4,080 horsepower, with 10,000 cubic feet a second in the river. That assumes a headwater elevation of 311.2 at Cascades, and 312.9 at the foot of the Pêche Rapids.

Q.—I think you stated that before.

A.—There are two different assumptions I have made on this: one that he is entitled to develop the property owned by himself; another that he is entitled to develop the property all the way up to the Pêche Rapids; most of which the Gatineau Power Company owns.

40 BY MR. KER:

Q.—You made certain answers to His Lordship qualifying the amount of power at the Cascades property under different conditions. In order to make it quite clear, will you please state without qualification what power there was on Mr. Cross' property if the Chelsea plant had not been developed? I am speaking of Cross' property in its natural state—that is, his own property.

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A.—He would have 3,000 cubic feet second, $2\frac{1}{4}$ feet of head; which would have been 770 hydraulic horsepower.

Q.—That is theoretical horsepower?

A.—Theoretical hydraulic horsepower.

BY MR. ST. LAURENT:

10 Q.—That is merely a mathematical calculation derived from a minimum flow of 3,000 feet, with a difference in level between the top and the bottom of what you consider to be Mr. Cross' property, fixed at $2\frac{1}{4}$ feet?

A.—Yes.

BY THE COURT:

Q.—Did the Chelsea work improve Mr. Cross' property?

20 A.—With the Chelsea plant developed, we regulated the river to 10,000 cubic feet a second. This estimate I have just given was on the basis of 3,000 cubic feet a second; it represented what he would have obtained if the Chelsea plant had never been built. The building of the Chelsea plant involved our putting in storage to increase the flow from 3,000 to 10,000 cubic feet a second. If the Chelsea plant had never been built, he could not have had more than 3,000 cubic feet a second for power purposes.

Q.—Why not?

A.—Because we would not have put in the storage reservoirs above if we had not built this plant below.

Q.—What do you mean by above?

30 A.—We built big storage reservoirs away up the river, about 100 miles north of Pagan—some of the largest storage reservoirs in America. This increased the flow from 3,000 cubic feet a second to 10,000 cubic feet a second. If those plants had never been built, all Mr. Cross would have had would have been 3,000 cubic feet a second and $2\frac{1}{4}$ feet of head on his own property—which would have meant 770 horsepower.

BY MR. KER:

40 Q.—Would it have been susceptible of economical development?

A.—No.

(And further deponent saith not.)

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DEPOSITION OF OLIVIER LEFEBVRE, A WITNESS EXAM-
INED ON BEHALF OF THE DEFENDANT
IN SUR-REBUTTAL

On this twelfth day of January, in the year of Our Lord one
thousand nine hundred and thirty-two, personally came and ap-
10 appeared
OLIVIER LEFEBVRE,

already sworn, who, being called as a witness on behalf of the De-
fendant in sur-rebuttal, deposes as follows:

EXAMINED BY MR. KER, K.C.,
OF COUNSEL FOR DEFENDANT:

Q.—You have already been sworn?
A.—Yes.
20 Q.—You have heard Mr. Beaubien's testimony to the effect
that the conditions at the Pêche Rapids could not be compared to
a submerged weir, in other words, that the physical condition was
not that of a submerged weir; and that the level at Wakefield could
be raised to 319.2 without any appreciable effect on the water be-
hind up to Paugan. What is your opinion as to that?

(Mr. St. Laurent, K.C., of Counsel for Plaintiff, objects to the
question as not being a proper matter of sur-rebuttal, the defence
30 having gone into this on its plea.)

Mr. Ker: I will amend the question.

BY MR. KER (continuing):

Q.—Mr. Beaubien gave the following testimony (page 504):

“ Q.—Is not the Pêche Rapids really of the nature of a
submerged weir?
40

A.—No. At first I thought it was, but it is not that at all.
It is a long sloping rapid 1,200 feet long, and there are only
seven to twelve feet drop as the case may be.

Q.—But you are sure there is no rock at the head of the
slope?

A.—There are rocks all over. It is nothing but rocks.”

He goes on to say it is partly solid rock at the top, but right be-
low the solid rock it seems to have been filled in with boulders rolled

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along the bed of the river, and the river seems to have filled up to a certain elevation. Anything above that is apparently carried away—it is smooth fill and partly boulders.

Will you state, from your own observation, just what is the situation at the Pêche, in the light of the testimony given by Mr. Beaubien?

10 A.—When I saw the Pêche Rapids my impression was it was a submerged weir, or acted similarly to a submerged weir. As a matter of fact, I may say that is the case with most of the rapids in any river; they act almost like a submerged weir. In this particular case cross-sections of the river have been taken for a distance of about half a mile above the crest of the rapid, and below, in order to ascertain what the conditions were. Those cross-sections show every characteristic of a submerged weir at that point. There is a distinct rise in the bed of the river, until the crest is reached, then there is a distinct slope downwards for a distance, as Mr. Beaubien said, of about 1,200 feet or so. Prior to that, there is a rise along the same distance, and then down. There is a distinct crest. The average crest of the controlling section—that is, the weir—is 311, when the river is 10,000
20 second feet. The surface of the water is about 319, making an average depth of 8 feet over the section.

It is well-known practice amongst engineers when endeavoring to determine to what extent the water may be raised below that crest, or backed against that crest, to apply a rule that what we call the submergence—the depth over the crest (the backwater) is not effective until it has covered a depth of about two-thirds of the depth flowing over that sill. In this instance it would indicate that backwater effect will not show until you have raised the water at Wakefield to somewhere around 316.3. At the same time, the hydraulic
30 computations using all those sections actually have given me 316.9.

Q.—To which you could raise the water without beginning to affect the water behind?

A.—That is the limit to which it could be raised without affecting the water above.

Q.—And that is as against Mr. Beaubien's 319.2?

A.—Yes.

Q.—So, according to your opinion he is allowing himself three feet without taking the weir into consideration?

40 A.—My hydraulic computations differ from his to that extent.

Cross-examination

CROSS-EXAMINED BY MR. ST. LAURENT, K.C.,
OF COUNSEL FOR PLAINTIFF:

Q.—Have you checked the hydraulic computations from the data appearing in the tabulation in Exhibit P-2 between figure 7 and figure 8?

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A.—No.

Q.—Being the actual elevation at Wakefield, and at Alcove, on the same day, for each of the days from May 1st to September 1st, 1927?

10 A.—No. You do not have to do that. I have taken a set of conditions. When the river is flowing at the rate of 10,000 second feet, the level at Alcove is so much; the level at the head of La Pêche Rapid is so much; and the level at Wakefield is so much. Having that condition, and having the cross-sections, and so on, then by hydraulic computations I have reached the point to which the water could be raised at Wakefield without affecting the level above. You do not have to compute it more than that particular set.

Q.—From your computation of 10,000 second feet, if the elevation at Wakefield is 318.51 what would the elevation be at Alcove?

A.—With 10,000 second feet, and elevation 316.8, the level at Alcove would be 320.7. If the water is 318.5 at Wakefield, I should say the backwater effect at Alcove would be something on the order of 12 inches or so.

20 Q.—But what would the elevation be?

A.—321.7, or thereabouts.

Q.—And if it was 320.92 at Alcove, while it was 318.5 at Wakefield, either the observation or the calculation would be erroneous?

A.—I believe so.

Q.—Have you made the computation only at 10,000 cubic feet second?

A.—I have made it also for 3,000 cubic feet second.

Q.—Were those the only two?

A.—Yes.

30 Q.—What are the characteristics of a submerged weir?

A.—It is an obstruction in the bed of a river, which is usually formed by a rise in the bed of the river.

Q.—Are not the formulæ which are used in dealing with submerged weirs developed from the knowledge obtained from water going over a dam or going through a submerged orifice?

A.—Yes, or going through what is called a broad crested weir. In this instance it is a broad crested weir to which the rapid is assimilated.

40 Q.—Is it not a fact that this rapid instead of offering a drop just below the crest offers a slope which extends over several hundred feet?

A.—Yes, but that does not change this rule at all, because the rule is applied to the submergence over the crest of the weir and not in the rapid below.

Q.—But is it not a fact that when water goes over an obstruction of that kind it tumbles, and that there is resistance and friction from the sloping bed over which it is flowing?

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A.—Yes, there is. That is what creates the rapids.

Q.—And as you raise the level you partially drown out the effect of that resistance?

A.—Yes. You can raise the water and drown it out to the extent of two-thirds of the depth going over the crest.

Q.—Are not all those hydraulic formulæ dealing with submerged weirs based upon figures taken above the obstruction?

A.—Yes, that is right. The conditions below the obstruction do not matter at all.

10 Q.—The conditions below the obstructions are not taken into account in those calculations?

A.—No.

Q.—In your opinion does it make any difference whether the conditions below are a sheer drop or are the bed of the river which naturally presents obstructions and friction?

A.—As regards the amount of water going over the crest of the weir it does not make any difference.

20 Q.—Is it not a fact that you have the friction of this sloping bed, and the water flows away from the crest of the weir less rapidly than if it is a sheer drop over the crest?

A.—But that does not affect the amount of water going over the crest, except to the extent that you may have a rough bed below, which would retard the water to the extent that it would cause backwater to about two-thirds of the depth going over the crest.

Q.—To the extent that it would naturally cause backwater?

A.—Yes.

Q.—And if you remove that you get away from the backwater effect produced by the natural conditions?

30 A.—Channel enlargement, yes.

Q.—Not only channel enlargement, but you increase the proportion which is not in contact with this rough bed?

A.—I am afraid I do not get your point.

Q.—If you have 3,000 cubic feet second over the river bed, there is a certain proportion of it which is in immediate contact with the bed itself?

A.—Yes.

40 Q.—And if you have 10,000 cubic feet second, the quantity which is in contact with the bed itself is the same, but the proportion of it to the total flow is smaller?

A.—Yes. That is what we call in hydraulic computations the hydraulic radius.

Q.—You have not taken that into account?

A.—Yes, we have taken it into account in the calculations.

Q.—In the calculations you have given here?

A.—Yes. No serious hydraulic computations can be made without taking that consideration into account.

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In Sur-Rebuttal
O. Lefebvre,
Cross-examination
Jan. 12th, 1932.
(continued)

Q.—And the only two points at which you have the calculation are 3,000 cubic feet second and 10,000 cubic feet second?

A.—Yes.

Q.—And, of course, since regulation 3,000 cubic feet second is a thing of the past?

A.—Yes.

Q.—So, the only flow for which you have it, which is practical at this time, is 10,000 cubic feet second?

A.—Yes.

10 Q.—I suppose there are not very many days on which it is exactly 10,000 cubic feet second?

A.—I must say that is so, yes. I suppose 10,000 cubic feet second is the average going through there in a day or in a week, but at times it must vary quite a lot from that.

Q.—And probably the variation would be from 10,000 to 15,000 or 16,000, and that would be the most frequent variation?

A.—It might go up to 15,000, and it might go down to 8,000.

Q.—But the figures I mention would probably cover the zone in which the variations would be most frequent?

20 A.—Yes.

Q.—Over 15,000 or 16,000 would be only for short time, during flood seasons, and I suppose below 8,000 would be very very rare?

A.—Above 10,000 or 15,000 would be normal perhaps two months in the year.

Q.—And, below 8,000?

A.—Would be for short periods—just for operating conditions.

Q.—You were not at all interested in checking those actual elevations for varying flows from 10,000 to 20,000 extending over a period of four or five months?

30 A.—No.

Q.—You prefer to rely on the one calculation, 10,000 feet second?

A.—10,000 cubic feet second is the condition prevailing most of the time on the Gatineau River.

Q.—The average condition?

A.—Yes.

Q.—That average being derived from the ups and downs?

A.—Yes.

40 (And further deponent saith not.)

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Defendant's
Evidence.
In Sur-Rebuttal
Claude Ralph,
Examination
Jan. 12th, 1932

DEPOSITION OF CLAUDE RALPH, A WITNESS EXAMINED
ON BEHALF OF THE DEFENDANT IN SUR-REBUTTAL

On this twelfth day of January, in the year of Our Lord one thousand nine hundred and thirty-two, personally came and appeared

10

CLAUDE RALPH,

already sworn, who being called as a witness on behalf of the Defendant in sur-rebuttal, deposes as follows:—

EXAMINED BY MR. KER, K.C.,
OF COUNSEL FOR DEFENDANT:

Q.—You have already been examined in this case?

20

A.—Yes.

Q.—You heard the testimony given by Mr. Beaubien?

A.—Yes.

Q.—You heard him state that although his proposed development at the Cascades would involve a level of 321.2 at Cascades and 325.2 at Wakefield, he is not prepared to increase the amounts allowed for highway and land damages as set forth in Mr. Simpson's estimate Exhibit D-95, which estimate was stated to be for an elevation of 318—in other words, that Mr. Beaubien does not think there would be any increase in those damages by holding the water at 321.

30 Will you kindly give His Lordship your opinion on that point?

(Mr. St. Laurent, K.C., of Counsel for Plaintiff, objects to the question in view of the fact that Mr. Beaubien stated the proposed level was 319, not 321; and moreover inasmuch as this is not proper sur-rebuttal, the witness having already been examined on this subject in defence.)

40 Q.—Under the heading of "Miscellaneous Items" in Exhibit D-95, highway, railway and flooding damages are set forth as \$47,900, \$66,000 and \$100,000. Do these figures purport to represent what the Company actually paid, or are they an estimate of what the Company would have to pay for a development to 318 at Cascades?

A.—They are an estimate of what it would cost the Company for an elevation to 318 at Cascades.

Q.—Would those figures be in any way applicable to a development with the water at 321 at the same place?

A.—They certainly would not.

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(continued)

Q.—Have you figured out to what extent they would have to be increased?

A.—Yes, I have.

Q.—And what is the figure to which you arrived?

A.—For an elevation of 321.2, as given by Mr. Beaubien, for Cascades; and for 325 at Wakefield, this figure would be increased at least \$300,000.

Q.—The Village of Wakefield would, to all intents and purposes, be practically submerged?

10 A.—He certainly would be running into damage actions from everybody in the village.

Q.—Your estimate is there would have to be \$300,000 added to this figure?

Q.—Mr. Beaubien further testified that with a comparatively small expenditure the conditions at the Pêche (which may or may not interfere with your work at Paugan) could be removed—that is to say, by dredging or excavating at the Pêche, with a comparatively small expenditure the complications which arise from those weir conditions could be removed, if found necessary. Has your
20 Company given any thought to that question, and, if so, when?

A.—I am not quite sure as to when. It is over a couple of years ago. We went into the question of the cost of the removal of the rock in that submerged weir—apart from this case altogether—and we found it would be prohibitive.

Q.—What was the figure?

A.—I think in the neighborhood of half a million dollars.

Q.—Approximately how much excavation would have to be done?

30 A.—Over 100,000 yards of rock.

Q.—At about \$4 or \$5 a yard?

A.—We have very elaborate sections, and profiles. We have full details on that, and we can produce them if you wish.

Q.—The object of them being to do away with this adverse effect?

A.—Yes. It was gone into separately, from a different standpoint.

Cross-examination

CROSS-EXAMINED BY MR. ST. LAURENT, K.C.,
OF COUNSEL FOR PLAINTIFF:

40

Q.—In speaking of elevations 321.2 and 325, do you realize that Mr. Beaubien was speaking of the possible occasions when there would be a flow of 60,000 cubic feet second?

A.—Yes, I heard him say that.

Q.—Do you know what Mr. Scovil shows on his graph Exhibit D-81 as being the elevation to which the water went at Wakefield, under natural conditions, at 60,000 cubic feet second?

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(continued)

A.—I have a hazy recollection of it, yes.

Q.—Something over 324?

A.—I believe it is something like that.

Q.—60,000 cubic feet second is something which may sometimes happen in the nature of a calamity, is it not?

10 A.—Under natural conditions, owners of property and the inhabitants of the banks of a river realize they cannot collect money from anybody, but my experience in the last six or seven years has been that where a corporation has built a dam and backed the water, regardless of height, where there is any possible chance of collecting money, even although the chance may be a minimum, actions are taken against the Company and claims are made against the Company by about 90 per cent of the people.

Q.—And do you not meet those claims by saying that you are not more responsible than Providence for the condition?

A.—We try to.

(And further deponent saith not.)

20 Mr. Ker: We produced certain copies of contracts between the Ottawa and Hull Electric Company and the Canada Cement Company, and between the Canada Cement Company and the Gatineau Power Company, with the understanding that we would obtain the originals. I now have the originals here, and offer them to my learned friends for comparison, following out our understanding that after comparison the copies will avail as proof in the case.

30 Mr. St. Laurent: And I think my learned friend was to complete his Orders-in-Council. I am not sure whether that has been done.

Mr. Ker: We will complete the Record by consent.

His Lordship: Do I understand this closes your sur-rebuttal, Mr. Ker?

Mr. Ker: Yes, my Lord.