INTERNATIONAL JOINT COMMISSION

HEARINGS AND ARGUMENTS

IN THE MATTER OF

THE APPLICATION OF THE NEW YORK & ONTARIO POWER CO. FOR APPROVAL OF THE OBSTRUCTION OF THE WATERS OF THE ST. LAWRENCE RIVER AT WADDINGTON, N. Y.

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ATLANTIC CITY, N. J., AUGUST 12–13, 1918
OTTAWA, ONTARIO, OCTOBER 1–4, 1918

Application filed April 19, 1918

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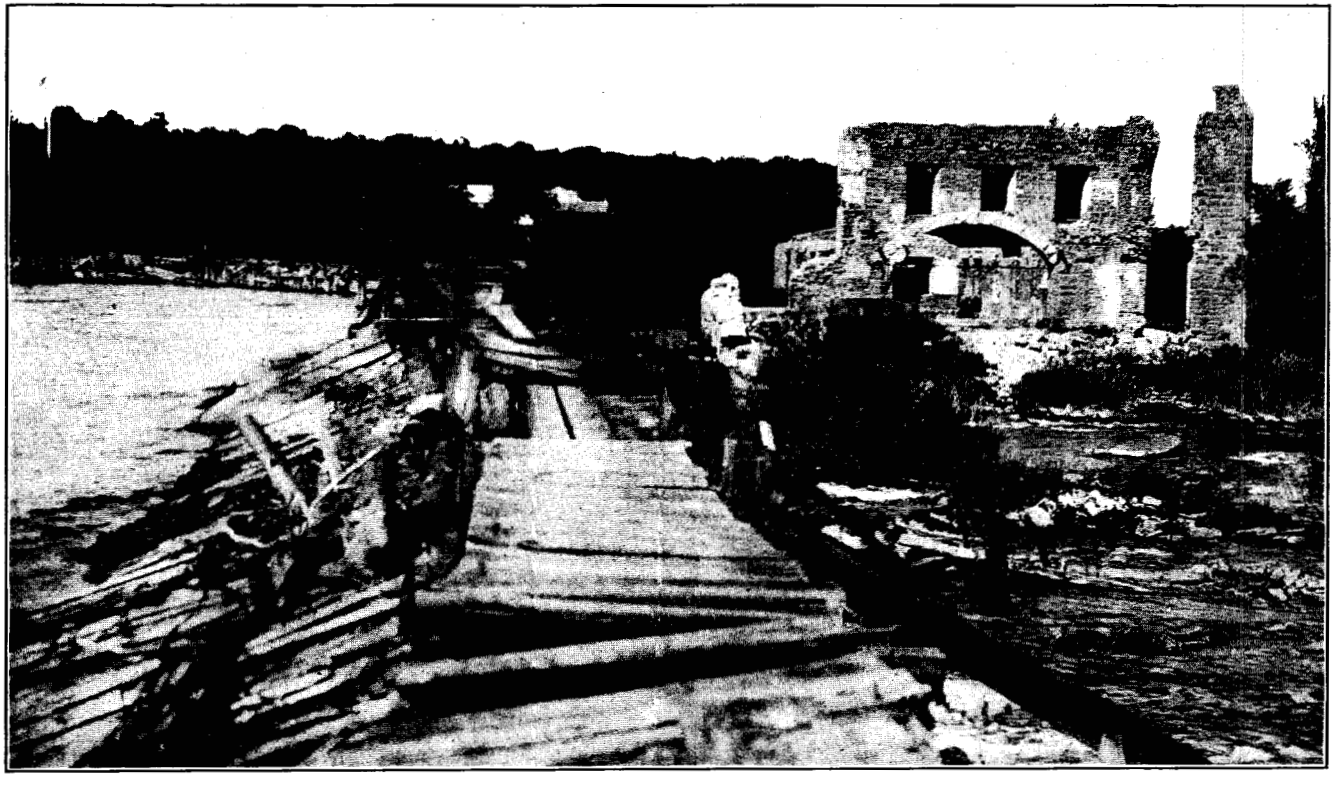
INTERNATIONAL JOINT COMMISSION.

CANADA.	UNITED STATES.
CHARLES A. MAGRATH, Chairman.	OBADIAH GARDNER, Chairman.
HENRY A. POWELL, K. C.	JAMES A. TAWNEY.
P. B. MIGNAULT, K. C.	R. B. GLENN.
Lawrence J. Burpee, *Secretary.*	Whitehead Kluttz, *Secretary.*

Exhibit N. Y.–3.



THE OLD DAM AS SEEN FROM HALFWAY ACROSS LITTLE RIVER, WADDINGTON-ON-THE-ST. LAWRENCE, N. Y.

INTERNATIONAL JOINT COMMISSION.

IN THE MATTER OF THE APPLICATION OF THE NEW YORK & ONTARIO POWER CO. FOR APPROVAL OF THE OBSTRUCTION OF THE WATERS OF THE ST. LAWRENCE RIVER AT WADDINGTON, NEW YORK.

ATLANTIC CITY, N. J., *August 12, 1918.*

The commission met at Atlantic City, N. J., Monday, August 12, 1918, all the members being present; Mr. Gardner presiding.

Mr. TAWNEY. Gentlemen, the chairman being called from the room temporarily, he has requested me to preside during his absence. I wish to state at the outset that this special meeting of the commission, which has been called for the hearing of the application of the New York & Ontario Power Co. was originally called to meet at Montreal, that being in the vicinity of the locus in quo, but owing to the ill-health of one of the members of the commission, who is temporarily in this city on that account, and his inability to travel to Montreal, the place of meeting was changed to Atlantic City.

The purpose of the session is for the consideration of the application of the New York & Ontario Power Co. for the construction of certain works in the St. Lawrence River in the vicinity of Waddington, N. Y.

Following the usual practice of the commission, the first thing we will do will be to have the secretaries read the notice calling the meeting and then enter the names of those who appear as representatives of the applicant and also the representatives of other interests who appear in opposition to or in favor of the application.

(The Secretaries stated that notice was sent to the press and interested parties as follows:)

NOTICE.

Notice is hereby given that there has been transmitted to and filed with the International Joint Commission by the Government of the United States, the application of the New York & Ontario Power Co., a corporation organized and existing under the laws of the State of New York, for approval of its plans to reconstruct, repair, and improve its dam, hydraulic structures, and water-power property at Waddington-on-the-St. Lawrence, N. Y., on the St. Lawrence River, the said St. Lawrence River being boundary waters within the meaning of the treaty between the United States and Great Britain of January 11, 1909. All persons interested in the above application are entitled to be heard with respect thereto before the commission.

WHITEHEAD KLUTTZ, *Washington, D. C.,*
LAWRENCE J. BURPEE, *Ottawa, Canada,*
Secretaries, International Joint Commission.

The State Department, Washington, D. C.
The War Department, Washington, D. C.
The State of New York.
John C. Crapser, Massena, N. Y.
Sir William Hearst, Premier of Ontario.

Sir Joseph Pope, under secretary of state for external affairs of Canada, Ottawa.
Mr. Alexander Johnston, deputy minister of marine, Ottawa.
Mr. A. W. Campbell, deputy minister of railways and canals, Ottawa.
Mr. James B. Hunter, deputy minister of public works, Ottawa.
Mr. Frank H. Keefer, K. C., counsel for the Dominion of Canada, Ottawa.
Mr. James White, assistant chairman, Commission of Conservation, Ottawa.
Sir Adam Beck, chairman, Hydro-Electric Power Commission of Ontario, Toronto.
Mr. Francis King, counsel for the Dominion Marine Association, Kingston, Canada.
Canada Gazette.
Morrisburg Leader.
The Ogdensburg Advance.

The following appearances were announced:

Mr. Frank H. Keefer, K. C., of Ottawa, counsel for the Dominion of Canada.

Mr. W. J. Stewart, of Ottawa, chief hydrographer of the Dominion of Canada.

Mr. Thomas Spratt and Mr. George E. Van Kennen, of Ogdensburg, N. Y., counsel for the New York & Ontario Power Co.

Mr. W. S. Connolly, Hamilton, Ontario, president of the New York & Ontario Power Co.

Mr. Francis King, of Kingston, Ontario, counsel for the Dominion Marine Association.

Mr. Arthur V. White, Toronto, representing the commission of conservation of Canada.

Mr. TAWNEY. Gentlemen, we are ready to proceed now with the hearing. Mr. Van Kennen, we will hear you first.

Mr. VAN KENNEN. Mr. Chairman, I assume that it will be proper for me to give you a brief history of this application and of the conditions and circumstances leading up to it.

This is an application for the approval of plans to reconstruct, repair, and improve a dam across one part of the St. Lawrence River at a place known in our section as Waddington on the St. Lawrence. At that place in the St. Lawrence River there is an island which is now known as Ogden Island, and that will be the term used generally during the time we are presenting this matter to you. That island is about $3\frac{1}{2}$ miles in length and it divides the river into two channels; one we call the North Channel and the other the Little River, which is the South Channel, the North Channel, of course, being that channel of the river lying between the United States and Canada, the Little River being wholly within the United States, and the island itself being wholly within the United States.

The North Channel we shall call the main channel of the river, because it is through this main channel that all navigation at the present time passes, so far as river navigation is concerned. On the northerly bank of the river there is a canal which has been constructed by the Canadian Government in, I will say, about the year 1850, which is used for all upstream navigation, as I understand it, and particularly freight navigation.

Mr. POWELL. It is known as what?

Mr. VAN KENNEN. Well, we call it the Morrisburg Canal. That is named for the little town across from Waddington.

Mr. POWELL. How far is that from Cornwall?

Mr. VAN KENNEN. I should say, offhand, something like 20 miles. This upstream navigation, as I understand it, is confined absolutely to light-draft boats. I think the Richelieu boats go upstream there drawing 7 or 8 or 9 feet of water in the North Channel. In the downstream traffic a great deal of our commerce goes through the northern channel between Ogden Island and the Canadian shore. They do not use, in other words, the canal for downstream traffic. They use it almost entirely for upstream traffic.

Now, so far as the Little River is concerned, there is, as I have stated before, no navigation of any kind. That is absolutely in the United States, at the present time at least.

Mr. MIGNAULT. The Little River is at the present time blocked by an old dam, is it not?

Mr. VAN KENNEN. Yes, sir; I am coming to that in a moment. Prior to the year 1808 that contiguous territory, including Ogden Island and all of the land on the South Shore, was owned by men by the name of Ogden and Waddington. They were the riparian owners on either side of what is known as the Little River, and as riparian owners they constructed a dam across the branch of the Little River. If you will refer to plate 1, you will see that the dam is marked "A."

Mr. POWELL. What do you say is the law of New York State as respects the bed of the stream there?

Mr. VAN KENNEN. The bed of the stream belongs to the State of New York.

Mr. POWELL. Not to the riparian proprietors?

Mr. VAN KENNEN. No. sir; I do not claim that. I am coming to that point, however, in a moment. I take it that that is a fair statement of the law. Our law is not entirely settled or very clear upon that question, but I believe that the courts will decide—if they have not already decided—that the bed of an international stream of this character rests in the State of New York.

Mr. MIGNAULT. Do you make a distinction between an international and a national stream?

Mr. VAN KENNEN. I make a distinction between an international stream and what I call a navigable stream in law.

Mr. MIGNAULT. Would you say that the bed of the Hudson belongs to the State of New York, for instance?

Mr. VAN KENNEN. It does, but not by virtue of what I am saying that it is an international stream, but, as I understand it, it belongs to it by virtue of the fact that the grants came from the old Dutch grants. Now, to illustrate that a little further, if you care to have me speak of it, we have other streams in the State of New York. We will take the Grasse River, which has been spoken of, and which is a stream not quite of the magnitude of the Hudson, but largely so. It is navigable in stretches. The bed of that stream belongs to the riparian owner. The bed of the Hudson and the bed of the Mohawk both belong to the State of New York, but not for the same reason. As a matter of fact, in the Mohawk the grants to the adjacent lands excluded the river.

Mr. MIGNAULT. In other words, have you or have you not in the State of New York a common-law doctrine as to the bed of streams belonging to the riparian owners?

Mr. VAN KENNEN. I will say we do have that common law. The common law prevails in the State of New York largely, I will say. The common-law rule does not prevail in the Mohawk. It does not prevail in the Hudson. The common-law rule, as I understand it, does not prevail in this particular case.

Mr. POWELL. We understand what you mean, although I do not just approve of your statement of it. Inasmuch as the bed of the stream of the riparian lands belonged originally to the Crown, the Crown could have parted with the whole or with a portion of it; and, as a matter of fact, the State or Crown only parted with that portion down to the bank.

Mr. VAN KENNEN. However, I am saying this, that these men were the riparian owners, as a matter of fact, and acting upon their rights as riparian owners, they constructed the dam.

Mr. MIGNAULT. They would require a little more, according to your statement. They would require the permission of the State of New York.

Mr. VAN KENNEN. That is what they did get subsequently. But even at that, even in streams where the bed of the stream is in the State, the law of the State of New York will yet permit a riparian owner to use the water for useful purposes, provided it does not interfere with navigation. Almost all of the water power laws of the State of New York, if I understand it correctly, are based upon that construction, and almost all the rights of water-power owners on many of the streams of the State of New York are based upon legislation permitting them to canalize those streams in order to permit them to take care of navigation. However, they built this acting upon their understanding that they had the right to do it, and if they did not interfere with navigation, I think the law would give them that right. But in the year 1808 the Legislature of the State of New York passed an act canalizing the stream, as I will call it, and perhaps I might read a portion of that act.

Mr. MIGNAULT. You have not put in a copy of that act, have you?

Mr. VAN KENNEN. No; but I will put it in. These are the powers that were given to Waddington and his associates:

> To construct a canal, lock and dam, or dams, in addition to the dam already constructed;

showing that at that time there was a dam there—

> for the purpose of making a complete navigable communication in said Little River, they and their heirs and assigns may take water * * * within any lock, dam, dike, or other improvement made by them; and make use of the same, either on their sole account or in connection with any person or persons for mills or other works for which the use of water is necessary which may be erected or constructed by them, or to grant, bargain, sell or otherwise to dispose of the use of the said water to any person or persons for any lawful purpose, and the moneys, rents and profits, resulting therefrom, to take and receive for their own use and benefit in addition to the tolls and profits hereinafter mentioned and allowed to be taken.

As I say, that was a canalizing act in our State authorizing them to maintain their dam at that point by providing for a lock in order that navigation service may not be hindered. And then it authorized these people to receive tolls. Then they went on a little further and the duration at that time of this grant was made 75 years.

In the year 1826 they passed a confirmatory act with respect to this particular water power, in which they granted to Ogden, who had then acquired all the riparian interests on both sides, the lands situate below the dam susceptible of improvement to the navigable water thereof. At that place at that time the stream was not navigable in fact. That is, I mean before the dam was constructed, and there was a shelf of rock, I will call it, lying below the dams upon which the mills were subsequently placed and from which they took their water power.

Now, in connection with that and in that same act they made use of this same language:

> That nothing contained herein shall operate to prevent the people of this State, at the expiration of the term of 75 years from the said 1st day of April, 1808, to alter and regulate the tolls on boats passing said locks, as they in their discretion may deem proper: *And provided further*, That nothing in this act contained shall be taken to prevent or in any manner to hinder the State from taking the said branch of river of St. Lawrence, below the said dam, and water for the use of any navigable canal or canals which may be constructed by the State, or by virtue or in pursuance of any act of the legislature of the State.

In other words, they merely reserved the right to regulate the tolls after the expiration of the 75 years grant under the previous act and also to take water for their own purposes.

Mr. MIGNAULT. Is it your contention that the grant was rendered perpetual by the act of 1826?

Mr. VAN KENNEN. That is my position. We got it from the two acts of the legislature.

Mr. MIGNAULT. It was first a right granted for 75 years, and your argument is that the confirmatory act by reserving merely the right to regulate tolls continued the original grant practically forever?

Mr. VAN KENNEN. That is what I say, in perpetuity. So far as that argument is concerned it is precisely upon the argument that you make. But we think we have a further right beside that.

Mr. MIGNAULT. I would not acquiesce in that immediately without some further argument.

Mr. VAN KENNEN. I wanted to say that in addition to that they had the dam there; they had had it before the act. It was not by virtue of the act, but they had it prior to the act, and they had it for over 100 years. We have had it, as I say, continuously. This first act of 1808 canalizing this stream——

Mr. POWELL. I would like to understand the significance of what you say about this time. Are you going to depend upon a statute limitation, so to speak?

Mr. VAN KENNEN. We have a perfect right to rely upon it.

Mr. POWELL. You are going to do that?

Mr. VAN KENNEN. I do not think I am driven to that alone, but I say we can rely upon it. Now, as I say, the act of 1808, canalizing this stream, authorized the construction of a lock for transportation purposes, and that condition was met by the then owners. A lock was built at this time and boats for several years after that made use of what we call the Little River for all navigation of the St. Lawrence River. There was no navigation in the North Channel at this time for the simple reason that it was several years after that before the canal was built by the Canadian Government. I am speaking now, of course, of upstream navigation. They not only did that, but

this company went further; they made use of the waterpower. They built the mills and built a canal from the reservoir above the dam laterally along the Little River, and a great many manufacturing interests were built up at that place and were in operation for a great many years.

Mr. GARDNER. Is that the canal built on the main shore?

Mr. VAN KENNEN. It is on the main shore, and they drew the water from this canal for the mills that were then in operation. Many years ago there were more than there are at present, because they were using it for milling purposes and for lumber and shingle manufacture, and paper, and so forth. At one time there was a very thriving little village. The power is now being used for electric lights. They have a plant of that kind and three or four very small industries are still taking their water.

Mr. GARDNER. Has the lock in the old dam been continued?

Mr. VAN KENNEN. It was continued until approximately 1850, when the Canadian canal was built, and then it fell into disuse. I think the true history of it is that it broke out at one time and was never replaced.

Mr. MIGNAULT. What is the present condition? Is the old lock still there?

Mr. VAN KENNEN. We have pictures of a part of the old lock. The old lock was taken out in a freshet along about the fifties, and I do not think it was ever replaced. All the traffic went upstream into the Morrisburg Canal.

Now, gentlemen, the applicant here has acquired, as I understand it, all the riparian rights and interest of these early owners. There is no question, so far as I know, in regard to that.

Mr. MIGNAULT. Will you please state your chain of title? Mr. Crapser has raised a question of title here.

Mr. TAWNEY. Are you prepared to present a prima facie case of title?

Mr. VAN KENNEN. Yes; I think so. On the canal there are one or two little water-power rights that we have not yet acquired. I am not raising that question at this time. I think Mr. Crapser and one or two other gentlemen have some slight interest on this canal. I suppose we are expecting to acquire all of it, but we have substantially all of the water-power rights, and we acquired them by means of conveyance directly from Ogden and his successors.

Mr. POWELL. They were the original grantees?

Mr. VAN KENNEN. Yes.

Mr. POWELL. Have you descriptions of those grants?

Mr. VAN KENNEN. We will have them presented to you. This company, as I say, is a public-service corporation. It was regularly incorporated.

Mr. MIGNAULT. In what year?

Mr. VAN KENNEN. In 1906 or 1908. I have the copy of the articles of incorporation.

Mr. MIGNAULT. Before that who owned the water power?

Mr. VAN KENNEN. Various people claimed ownership by virtue of sales being made by, we will say, the Ogdens and their successors in title, and these were all purchased and finally consolidated into this company, with the exception of one or two that we are about to

take up. But the point I am getting at is this: This company is a public-service corporation, and in our State we have what is known as a public-service law. Before such a company could be formed we had to apply at that time to the gas and electricity commission, which was a commission of the State of New York created by statute that regulated and controlled public-service commissions, and particularly applications with respect to the development of power. The powers and duties of the gas and electricity commission were subsequently carried over into our public-service law, and it is now our public-service commission that has control. We were required under the law to make an application, and we did make an application to the commission of gas and electricity. We were granted authority to exercise our rights as a company, and we were also granted authority at that time to incorporate for the amount of $2,000,000 of stock and also $2,000,000 in bonds.

Subsequently, we had to make a further application to this commission for authority to purchase the property, which we did, and it was under the authority and direction of the public service commission that we purchased this property and paid at the time $150,000 of the stock of this company and $150,000 of the bonds of this company. That was to acquire all of the water-power properties and rights, including the water rights and also all the physical property and lands that we owned at that time under these various grants and lands that had been acquired and purchased from time to time. Since that time, of course, we have been operating there, but only in a very small way. We have maintained all this time a staff of resident engineers. Unfortunately, one of our resident engineers is sick with typhoid fever, and can not be here. But from that time they have made studies of the situation with reference to the proposed development of electrical plant at that place, and our application is a result of our studies with respect to that matter. At this time the dam, of course, has become out of repair, and it must be repaired because it would be worthless, so far as power purposes are concerned.

We expect to show—and this is where our engineers' studies have come in—what we think were our rights, and assert them as our rights, to the natural flow of the Little River.

Dam B on the map is the old dam, and the dam that is now there our engineers have suggested that if we can get permission it would be a feasible thing to put it down, I think, about 1,000 feet, where it is marked on the map "A." The reason for that is that we get a trifle better head, and also, as I understand it, the expense will be less, because that is about the place where the rock shelves off and where the deep water begins in the Little River. Where dams B and A are now is rock formation, and there were very swift rapids there in the early days. Of course, the dam now protects it. The rock is practically at the surface of the water. The tailrace runs around the curve next to the island at the present time. We are asking permission to move that down a few feet; I do not just recall how many feet; but let us say 300 or 400 feet.

Mr. MIGNAULT. You want to move it from B to A?

Mr. VAN KENNEN. Yes, sir. If you will go upstream from B you will see C. That is a bridge. Of course, that is an artificial obstruc-

tion in Little River at that place, put in by the later owners of Ogden Island for the purpose of getting across, but it was put in with the understanding, as our title deeds will show, that it would be removed at any time that they might want it removed for hydraulic purposes.

Mr. MIGNAULT. Is that bridge owned by private parties?

Mr. VAN KENNEN. Yes; I think so. It is now owned by the Crapsers. They own the island. We hold the title to that bridge. That is to say, we can remove it.

Mr. MIGNAULT. You say the bridge belongs to the Crapsers?

Mr. VAN KENNEN. I think the predecessors put it in with our consent.

Mr. MIGNAULT. Have you any agreement giving you the right to remove it?

Mr. VAN KENNEN. Yes, sir.

Mr. MIGNAULT. Are there any settlers living on Ogden Island?

Mr. VAN KENNEN. Ogden Island is owned by one man now, or by one estate, as I understand it.

Mr. MIGNAULT. But do any people live there?

Mr. VAN KENNEN. Yes, sir.

Mr. MIGNAULT. Have they any other way of crossing the Little River except by that bridge?

Mr. VAN KENNEN. No, sir. Our provision is that we are to furnish a way. We have taken care of their rights by agreement. We are asking to have those artificial obstructions removed, of course.

Mr. TAWNEY. By "artificial obstructions" you refer to bridge C?

Mr. VAN KENNEN. To bridge C; yes, sir.

Mr. TAWNEY. If you have an agreement under which you can remove it, what is the necessity for that?

Mr. VAN KENNEN. All of this matter is before your commission, of course. If we remove that bridge, naturally there will be more water flowing down through the Little River, and consequently less flowing down through the north channel.

Mr. TAWNEY. What is the length of that bridge?

Mr. VAN KENNEN. I should say, offhand, it might be 10 rods at that place.

Mr. TAWNEY. How many piers are there in the river?

Mr. VAN KENNEN. It is a rock fill with the exception of two cuts in it. Possibly you could see that a little better if you look at the photograph.

Mr. GARDNER. How far is that bridge from where that Little River is diverted?

Mr. VAN KENNEN. Do you mean from the entrance of the Little River down to the bridge?

Mr. GARDNER. Yes, sir.

Mr. VAN KENNEN. If I were going to estimate it, I would say a mile and a half. Of course, there are other artificial obstructions in the channel. For instance, ice-thrown bowlders that we find in the channel at various places. We are asking for the right to remove those artificial obstructions. We are asking further, with reference to the Little River, the right to make a certain amount of excavation in that river so we can use the natural flow of that stream to the highest degree of commercial efficiency. Now, I think I will explain

that a little further by saying, if I understand it correctly, that in order that we may maintain our head at that dam, which is approximately 12 feet, we must have the water coming through the dam steadily, so that when it passes through the wheels there will not be a lowering of the head. That will require some excavation in this channel. With respect to what I am speaking of here, if you will notice we have made plate No. 2, which shows what we claim to be the natural flow of that stream to which we believe we are entitled under the law, and all we are asking with respect to that is the right to make such excavations as will enable us to use the natural flow efficiently. That is all there is to that part of our application.

Mr. TAWNEY. Right there, if you will pardon me. In making these excavations that you speak of will you, to any appreciable extent, lower the level of the north channel of the river?

Mr. VAN KENNEN. If we take out of the Little River the natural flow of that stream, we will lower the north channel to a degree. We will use the water, and more of it will go down through the Little River.

Mr. TAWNEY. Would the commission have anything to do with the approval or disapproval of the excavation unless it affected the level of the river? That is what I am getting at.

Mr. VAN KENNEN. I take it that you would have something to do with it. We are not using the stream now because of these artificial obstructions. We are not using what we are entitled to, and that is the natural flow of the stream.

Mr. MIGNAULT. I suppose your suggestion is that putting in the dam altered the natural condition of things, and I think it did. It probably raised the level of the river higher than it was previously. If the dam be demolished——

Mr. VAN KENNEN. Then there would be a great deal more water through there. That would have the effect of lowering the water in the North Channel. I am now speaking about the natural flow of the Little River. We are asking that we be given permission to remove such artificial obstructions in the Little River and also make excavations in the Little River, so that we can use what we claim we are entitled to legally at the highest degree of efficiency.

Mr. GARDNER. Are there any considerable number of those obstructions?

Mr. VAN KENNEN. I should say that almost every year it changes. The River St. Lawrence is an icebound river, as has been fully explained here this afternoon, and it is nothing uncommon for the ice to take down bowlders, and, of course, they drop wherever they happen to be when the ice grip loosens. Several of these bowlders have been dropped at the entrance of Little River. When we speak about removing obstructions, of course, we expect to take those out. Naturally, silt has gathered in there, as it would in any mill pond, and we expect to take that out. I want the commission to understand perfectly what we are asking for, because we think we are asking for only what are our rights on that point. We are not asking any favors upon this proposition, namely, that we think we are entitled under our right, first, as riparian owners; second, under the statute; and, third, by prescriptive right, if you please, to the natural flow of that stream for power purposes. All we ask with reference to that

is to be permitted to use that particular flow to the highest degree of efficiency, and our plate 2 shows what the natural flow of the stream is. Of course, it is evident that the higher the water is in the main river the greater would be the discharge in the Little River. Consequently, it is based upon the elevation of the river itself; or, if you put it another way, the natural flow of the Little River is based entirely upon the discharge of the main river. If it is 250,000 second-feet in the main river, we have so many thousand feet that would naturally flow down the Little River. If it is 300,000 second-feet, we have more. But, generally speaking, the natural flow of the Little River is approximately 10 per cent of the discharge of the main river.

Mr. MIGNAULT. What do you understand by the natural flow of the Little River? Is it the natural flow under present conditions?

Mr. VAN KENNEN. No; I understand it to be as nature would have made it.

Mr. MIGNAULT. You will observe that the condition of nature was changed when the dam was put in.

Mr. VAN KENNEN. Yes, sir.

Mr. MIGNAULT. And you suggest if you take out the dam and remove all obstacles, like the bowlders, you are not doing any more than exercising your rights?

Mr. VAN KENNEN. That is what I think.

Mr. MIGNAULT. Do you go any further; do you propose to dredge so as to deepen the channel?

Mr. VAN KENNEN. Yes, sir.

Mr. MIGNAULT. And in doing so you take more than the natural flow?

Mr. VAN KENNEN. No, sir; we do not ask to take any more.

Mr. MIGNAULT. No; but you would, as a matter of fact, if you deepen the channel.

Mr. VAN KENNEN. If we deepen the channel we could take more, but we are not asking to take any more in that part of our application.

Mr. MIGNAULT. But, as a matter of fact, you would take more?

Mr. VAN KENNEN. Perhaps I do not quite understand you, but this is the point that I want to impress upon you: I take it that we are entitled legally and under the present conditions to the use of the natural flow of the Little River for power purposes. We are seeking to determine what that natural flow would be when the river discharges its various amounts of water. Now, the question comes, if I understand you, are you seeking to excavate anything in the channel of that river in order to use that natural flow?

Mr. MIGNAULT. I asked you if you are going to do more than remove the bridge and these bowlders, or do you propose to excavate to deepen the channel?

Mr. VAN KENNEN. We do propose to excavate; yes, sir.

Mr. GARDNER. Assuming that the statement is correct that under natural conditions 10 per cent of the total flow goes down through Little River, under your proposed improvement you still have in mind that you are going to take that 10 per cent that would naturally go through and no more?

Mr. VAN KENNEN. That is my position now at this point of my discussion.

Mr. TAWNEY. If you will permit me, I do not think you are required at this time to support the allegations of your application by argument, but to state the facts which you propose to offer in support of your allegations and leave the discussion until the evidence has been presented.

Mr. VAN KENNEN. I do not want to discuss the evidence, but I do want to make clear what our application is, and I say that so far as that is concerned we ask merely to make such excavation as will give us the natural flow of the stream to which we think we are entitled as matter of law and leave it at the highest degree of efficiency.

Mr. TAWNEY. And you are prepared to prove what the natural flow would be?

Mr. VAN KENNEN. Yes, sir.

Mr. POWELL. Suppose that these bowlders are brought down by the ice. There is nothing artificial about that; that is nature.

Mr. VAN KENNEN. I suppose that is a natural condition.

Mr. POWELL. Then, would not the condition of the river, when it was choked to a certain extent by these bowlders, be a natural condition, and would not the flow under those circumstances be the natural flow of the river?

Mr. VAN KENNEN. That gets into a question of law which it is a little difficult to discuss at this point; but if a man has a right to maintain a dam, he has a right to keep his mill pond clear; and if a bowlder falls into his mill pond he has a right to take it out; otherwise, the channel might be filled up and the small stream cease to exist.

Now, aside from what I claim is our right to the natural flow of this stream and to the right to use it to the highest degree of efficiency, we are asking something further; but I wanted to get the two clearly before you. At D you will find an embankment or a rock fill extending from Ogden Island to Canada Island, as shown on plate 1. That is a proposed rock fill. At that point the water is very shallow. You can see the current as it comes down the North Channel is divided by Canada Island, and part of it goes between Canada Island and Ogden Island, but the larger part of it by far goes north by Canada Island.

Mr. MIGNAULT. Where do the boats navigate?

Mr. VAN KENNEN. North of Canada Island. That water there is very shallow. There is no navigable channel there for what we call canal-size boats.

Mr. MIGNAULT. Between Ogden Island and Canada Island?

Mr. VAN KENNEN. Yes, sir. No boats go down there unless it might be a rowboat or a motor boat drawing a foot or 2 feet of water. There is no navigation between Canada Island and Ogden Island.

Mr. MIGNAULT. Your plan does not show the depths?

Mr. VAN KENNEN. No, sir; but we will offer proof as to that. We are proposing to make a fill at this point [indicating on the map] between those two places. That will have two effects. It will lower our tailrace a little, thereby benefiting us to a certain extent; and it will have the effect of raising the water in the North Channel. One of the great effects which we claim for it is this, that there is a very

severe side draft between Canada Island and Ogden Island, and it is very difficult to manage the boats and tows. That is the graveyard of the St. Lawrence at that point. The swift current drawing from the main channel in between these two islands in the shallow water has been the destruction of many of our tugs and tows and barges.

Mr. POWELL. That is, the current carries the vessels onto the shoal?

Mr. VAN KENNEN. Yes, sir.

Mr. MIGNAULT. I suppose it would have the effect of increasing the velocity of the current between Ogden Island and the north shore?

Mr. VAN KENNEN. Undoubtedly it would increase it some. But we believe and expect to show that it will be a benefit to navigation. It certainly will do away with the menace of that swift side current, which, as I say, has piled up many a boat in the navigation of the river at that point, and which I think we are prepared to show by practical navigators that that is one of the very bad spots. The effect of that fill being put in there will be to raise the water in the main channel and it will overcome, as we claim, the lowering of the water in the North Channel by taking additional water through the Little River. In other words, it is in the nature of compensation works. We believe that the Governments could easily afford in the interest of navigation to do that at their expense.

Mr. GLENN. Would it not injure navigation to Clark Island?

Mr. VAN KENNEN. Well, there is no navigation down through there. A motor boat drawing 2 feet of water might get by. There is no objection, so far as the people owning Clark Island are concerned.

Mr. POWELL. About how much is it anticipated to raise the water between Canada Island and the mainland?

Mr. VAN KENNEN. Of course, I take it that as an engineering proposition at different stages of the water there would be a difference; but I will state that it would compensate, and the engineers will show how much.

I might say to you, to be perfectly frank, that about midway from the point up here [indicating on map] down to Canada Island there is the shallowest part of that North Channel.

Mr. GLENN. Can you give it in feet? At the intake how much would it be lessened?

Mr. VAN KENNEN. By the diversion of all we are asking?

Mr. GLENN. Yes, sir. How much would it lessen it?

Mr. LEA. At the very most it would be a little over 18 inches.

Mr. VAN KENNEN. As I say, at about midway down that side there is the shallowest part of the river. The boats draw 14 feet in the canal. That is the canal draft at that point. When the water is 14 feet over the sill at the entrance, or approximately that, there is a little better than 12 feet over the shallowest part. That is as near as I can give it to you without consulting some other figures. We claim that the backwater effect of building this fill here will at the point that we are speaking about, the shallow point, compensate for that, and our engineers will show it.

Mr. TAWNEY. You are prepared to show that it will raise the level of the water on that side to the advantage of navigation?

Mr. VAN KENNEN. Yes, sir.

Mr. MIGNAULT. What is the length of Ogden Island?

Mr. VAN KENNEN. Three and a half miles.

Mr. MIGNAULT. Whatever additional water you take out you will take out at the head of Ogden Island?

Mr. VAN KENNEN. Yes, sir.

Mr. MIGNAULT. Do you claim that the obstruction of this embankment at point D will compensate for any decreased level at the head?

Mr. VAN KENNEN. Not quite. I do claim that it will compensate for any lowering of the water over that point on the river. The engineers will say that the backwater will extend above the lock.

I just want to make one further statement with regard to that. At E—that is, the lock entrance—we propose to put in a submerged weir to raise the water at that place sufficiently to compensate for any additional water that is taken out of the Little River. That, generally speaking, is our plan. If you will notice at E, we are speaking there of a submerged weir, which, of course, is not intended to interfere with navigation; but it will furnish a sufficient amount so as to maintain the level at the entrance of Lock 24. Generally speaking, that is our project and what we are going to offer testimony about. I am sorry to say that owing to the illness of one of our witnesses we may have to defer a part of the testimony, but we will do the best we can.

Mr. TAWNEY. Did I understand you to say that you did not, on account of the illness of one of your engineers, expect to conclude the testimony at this hearing?

Mr. VAN KENNEN. Perhaps we can. There may be certain data that we may have to have; but I do not know how it will turn.

Mr. POWELL. We ought to see the locus in quo up there.

Mr. VAN KENNEN. You ought to see it.

Mr. TAWNEY. We should see it after the testimony is in, because we can understand it better then. Gentlemen, we will now take a recess until 10 o'clock to-morrow morning.

(The commission thereupon recessed until Tuesday morning, Aug. 13, 1918, at 10 o'clock.)

TUESDAY, AUGUST 13, 1918.

At the expiration of the recess, the commission reconvened at 10 o'clock a. m.; all the members being present, Mr. Gardner presiding.

Mr. GARDNER. Are you ready to proceed, Mr. Van Kennen?

Mr. VAN KENNEN. Yes, sir. I am going to make the suggestion that inasmuch as some of the representatives of the Dominion of Canada and also of the Marine Association of the Dominion are present, perhaps if they state their point of view now it might narrow the issues a little in this matter.

Mr. GARDNER. Is it your desire that they be heard now?

Mr. VAN KENNEN. I thought perhaps in the interest of expediting it it might be well. I have read the responses and I understand them. I did not know but what they might have something to say in regard to the matter.

Mr. MIGNAULT. I think you had better proceed. The other parties in interest will make their statements before they begin to offer their testimony. That is the usual way.

W. S. CONNOLLY, produced as a witness for and on behalf of the applicant, after being first duly sworn, was examined and testified as follows:

Mr. VAN KENNEN. I thought perhaps we ought to put in something with reference to the title to this property and something with reference to the organization of this company, showing that it is a bona fide public service corporation. Unfortunately, I have not had time to have some of the title deeds certified, but I will put them in and have them certified afterwards, with the permission of the commission.

Mr. MIGNAULT. The rule is that two duplicate originals of each exhibit should be put in, but I presume it would be difficult to do that. You could put in copies or if you can put in duplicate originals, it will be in order.

Mr. VAN KENNEN. I can do that but not to-day.

Mr. TAWNEY. You may submit them later for the record. Are these title papers that you propose to submit from the original grant down to the applicant?

Mr. VAN KENNEN. Yes, sir. I propose to submit them—I can not submit all of them this morning—but I will submit an abstract of title from the first grant from the State of New York to the present time, showing the title in this company of all these water-power properties and rights.

Mr. TAWNEY. Which would at least make a prima facie case of title?

Mr. VAN KENNEN. Yes, sir.

Mr. TAWNEY. Mr. King—I do not see Mr. Keefer here—does the Dominion Marine Association question the title of the applicant to the property that is affected here?

Mr. KING. I can not speak for Mr. Keefer, but for myself I question very definitely a certain statement made yesterday as to the title, and as to the expiration of the title at the termination of 75 years. I do not think the statutes were fully quoted.

Mr. TAWNEY. That is a matter for argument.

Mr. KING. Well, the statutes speak for themselves.

Mr. VAN KENNEN. I expect to put the statutes in so that the commission will have the benefit of them. I do not know that it will be necessary to put the statutes in, but inasmuch as this is a Federal matter and it is a State statute we will have it all before you.

Mr. Connolly, you are the president of the New York & Ontario Power Co.?

Mr. CONNOLLY. I am.

Mr. VAN KENNEN. Do you remember the date when that company was incorporated?

Mr. CONNOLLY. It was incorporated in 1906.

Mr. VAN KENNEN. Generally speaking, what was the purpose of the incorporation?

Mr. CONNOLLY. It was the formation of a company to develop the Waddington water power and sell and distribute electricity.

Mr. VAN KENNEN. How long have you been connected with that company?

Mr. CONNOLLY. Since 1909.

Mr. VAN KENNEN. How long have you been president of the company?

Mr. CONNOLLY. Since 1911.

Mr. VAN KENNEN. And the directors of the company, would you name them and give their addresses?

Mr. CONNOLLY. Mr. James Thompson, Hamilton, Ontario; James A. Thompson, Hamilton, Ontario—those are father and son; James G. Allan, Hamilton, Ontario; F. W. Gates, Hamilton, Ontario; James T. Lockenby, Hamilton, Ontario; Adam Zimmerman, Hamilton, Ontario; James Wilson, Ferguson, Ontario; and David J. Crichton, Ogdensburg, N. Y.

Mr. VAN KENNEN. I wish to offer in evidence a certified copy of the articles of incorporation of this company, bearing date the 11th day of April, 1906, and certified as of record in our county clerk's office.

(The paper just offered in evidence was marked "Applicant's Exhibit A–1.")

Mr. VAN KENNEN. I have a copy of that here which I will offer with it, if the commission desires it that way, or I will have another certified copy of this filed with the commission.

Mr. MIGNAULT. So far as you can, file duplicate certified copies.

Mr. VAN KENNEN. It is not a certified copy, but it is a true copy. Now, an application was subsequently made in the year 1909 to the commission of gas and electricity for authority to transact business in the State of New York?

Mr. CONNOLLY. Yes.

Mr. VAN KENNEN. This was the decree that was made upon that application, which I offer in evidence. We were obliged to apply to this commission before we had authority to transact business.

(The paper was marked "Applicant's Exhibit A–2.")

Mr. VAN KENNEN. After the order of the commission of gas and electricity, did the company begin the transaction of business by the acquisition of the property?

Mr. CONNOLLY. Yes; they purchased the property.

Mr. VAN KENNEN. Can you state the purchase price of that property that was authorized by the gas and electricity commission?

Mr. CONNOLLY. The company was authorized to pay for it by the issuance of $150,000 of paid-up stock and $150,000 of 5 per cent bonds. Both stock and bonds were issued under the authority of the commission and a price was set at which they could be sold.

Mr. GARDNER. What year was that?

Mr. CONNOLLY. 1907.

Mr. MIGNAULT. Was the stock issued in exchange for these rights that you purchased?

Mr. CONNOLLY. Yes, sir; with the titles; both the stocks and bonds were given.

Mr. POWELL. You had authority for the corporation to do that?

Mr. CONNOLLY. Yes; the whole matter was gone over by the public-service commission, and gone over in that way.

Mr. VAN KENNEN. Now, I want to offer the deeds to the property. There are three of them, of which, unfortunately, I have no copies. The first deed is one from J. Wesley Allison to the New York & Ontario Power Co., bearing date the 10th day of July, 1907, and

recorded in the office of the clerk of the county of St. Lawrence on the 13th day of July, 1907.

(The deed was marked "Applicant's Exhibit A–3.")

We have another deed here from J. Wesley Allison to the New York & Ontario Power Co., bearing date the 10th day of July, 1907, and recorded on the 13th day of July, 1907.

(This deed was marked "Applicant's Exhibit A–4.")

I also offer a deed from J. Wesley Allison to the New York & Ontario Power Co., bearing date the 15th day of September, 1910, and recorded in the office of the clerk of the county of St. Lawrence on the 26th day of November, 1910.

(Marked "Applicant's Exhibit A–5.")

Mr. MIGNAULT. Was Mr. Allison one of your incorporators?

Mr. VAN KENNEN. No; I think not.

Mr. CONNOLLY. He is not associated with the company at all.

Mr. VAN KENNEN. He was not an incorporator. The title to the company was merely taken through him.

Mr. MIGNAULT. Are you going to trace the title back from Mr. Allison?

Mr. VAN KENNEN. I am going to trace the title back by introducing an abstract of title from the beginning to the present time, which, of course, would cover some of it.

I offer in evidence a deed from John Porteous to Walter S. Connolly, the president of this company, bearing date the 23d day of November, 1912, and recorded in the office of the clerk of the county of St. Lawrence on the 12th day of December, 1912.

(The deed just above offered in evidence was marked "Applicant's Exhibit A–6.")

Mr. Connolly says this title was never formally passed to the company, but he holds it in trust for the company.

Here is another deed, from Mr. Allison to Walter S. Connolly, to what is known as a part of the water foreside property, bearing date the 26th day of March, 1912, and unrecorded up to the present time.

(This deed was marked "Applicant's Exhibit A–7.")

Mr. VAN KENNEN. Mr. Connolly, you also hold that as trustee for the company?

Mr. CONNOLLY. Yes.

Mr. VAN KENNEN. I offer in evidence a deed dated the 28th day of July, 1911, from J. Wesley Allison to the New York & Ontario Power Co., which is unrecorded.

(The deed was marked "Applicant's Exhibit A–8.")

Mr. POWELL. That is held in trust, also?

Mr. VAN KENNEN. No; that goes directly to the New York & Ontario Co.

Mr. MIGNAULT. Mr. Van Kennen, these two deeds that are not recorded, are the deeds effective without being recorded?

Mr. VAN KENNEN. Yes, sir; they are effective, but we have not recorded them simply because we have not gotten around to it yet. We have an abstract of a piece of property by William J. Rutherford and William C. Dunn to what we call one of the Rutherford properties. It is one of the water rights connected with the canal. I will mark that "Abstract," but I want to substitute the deed.

(The abstract was marked "Applicant's Exhibit A–9.")

Mr. VAN KENNEN. The deed to that property was taken in the name of Mr. W. S. Connolly, in trust for this company.

Mr. MIGNAULT. Just state the nature of that.

Mr. POWELL. It is an abstract giving a memorandum of all the conveyances.

Mr. MIGNAULT. By that abstract the title is traced down from whom?

Mr. POWELL. It is from a man by the name of Martin.

Mr. VAN KENNEN. It is supplemented by his testimony that he has taken the deed in trust. This abstract of title is dated the 3d day of July, 1911, and signed by Frank M. Cleveland, an abstract clerk of the county of St. Lawrence.

I want to offer also in evidence a certified copy of chapter 121 of the laws of the State of New York of 1808, passed April 1, 1808.

(This paper was marked "Applicant's Exhibit A-10.")

Mr. VAN KENNEN. Now I wish to offer in evidence a copy of the confirmatory act passed by the Legislature of the State of New York on the 17th day of April, 1826.

(This paper was marked "Applicant's Exhibit A–11.")

Mr. VAN KENNEN. This paper is not certified. I have not had time to get the certification.

Mr. MIGNAULT. You will take note to have all these documents certified.

Mr. VAN KENNEN. I will make some arrangements with the clerks so that there will be no difficulty. I have here a certified copy of the mortgage covering this property, bearing date the 1st day of August, 1907, between the New York & Ontario Power Co., and the Knickerbocker Trust Co., of New York City, as trustee for the bondholders.

(This paper was marked "Applicant's Exhibit A–12.")

Mr. VAN KENNAN. I wish to offer also a certified copy of the order of the public-service commission, bearing date January 14, 1909, authorizing the issue of the remaining amount of bonds, $1,850,000 worth of bonds, and stock to the amount of $600,000. I may explain with reference to this that these orders issued by the public-service commission specifically state for what purpose these expenditures must be made, and also fix the amount at which the bonds and stock of the company are to be disposed of and for what. The stock under this order was disposed of for cash at par and the bonds were authorized to be sold at not less than $81.

(The paper was marked "Applicant's Exhibit A–13.")

Mr. VAN KENNEN. That was modified by a subsequent order made on the 28th day of April, 1913. It is an amendatory order, the purpose of which was merely to reverse the amount of the issue of stock and bonds. In other words, to issue stock instead of bonds, cutting down the amount.

(The amendatory order was marked "Applicant's Exhibit A–14.")

Mr. VAN KENNEN. I will offer in evidence this copy of the order of public-service commission on March 26, 1914, the order part of it authorizing the issuance of the $1,800,000 worth of stock.

(This paper was marked "Applicant's Exhibit A–15.")

Mr. VAN KENNEN. I wish also to introduce here at this time a permit, bearing date the 15th day of May, 1916, signed by the Secretary of War, Mr. Newton D. Baker, approved by the President of

the United States on the 29th day of May, 1918, authorizing the company to construct a transmission line across the River St. Lawrence.

(This paper was marked "Applicant's Exhibit A–16.")

Mr. MIGNAULT. Just make that a little more definite. That is to authorize the construction of a transmission line across the whole river?

Mr. VAN KENNEN. Yes, sir; across the River St. Lawrence.

Mr. MIGNAULT. From shore to shore?

Mr. VAN KENNEN. Well, the Little River, where the proposed development takes place, is the south branch, and, of course, there would be the beginning of the transmission line. Then, of course, it would be carried across the island to the main north channel, and what we had to apply for was to get authority to extend it across the river.

Mr. SPRATT. Across the North Channel.

Mr. VAN KENNEN. That had to be done by an application to the Secretary of War, and inasmuch as it constituted a physical connection between the two countries, the State Department had to approve it, and there are both of the papers.

Mr. POWELL. It would be only an authority to the center of the stream, of course?

Mr. VAN KENNEN. As far as we were concerned. Now, Mr. Connolly, are you familiar with the location of that river at that point?

Mr. CONNOLLY. I am.

Mr. VAN KENNEN. Will you briefly state to the commission what the purpose of this project is and how it is proposed by your company to make this development?

Mr. POWELL. We had the plan here yesterday. Was that attached to your application?

Mr. VAN KENNEN. Yes, sir; we have a small plan attached to the application. Mr. Connolly, I wish you would describe briefly the physical condition.

(Speaking with reference to the plan attached to the application, Mr. Connolly proceeded as follows:)

Mr. CONNOLLY. The existing dam is an old wood structure—a gravity crib dam. That is at point B. It is completely out of repair. It has been there I know since the year 1806, and, consequently, as there is an end to all things, that dam is pretty nearly gone. We propose replacing that in either of two ways, either by a new concrete dam at point A, about 900 feet easterly from the present dam, or to have the option of reconstructing and repairing the present dam at point B in substantially the same location where it is now by putting in a concrete structure to receive our turbines and generators in place of the present wooden structure; and to renew the connection of the dam to both sides of the mainland. If that be done, then we will put machinery in the dam, put wheel chambers in the new dam, and proceed to develop power. In connection with that we wish to obtain a permit to clean out the Little River obstructions, so that we can use the maximum head there, use whatever flow of water we are entitled to, with as little loss as possible.

Mr. VAN KENNEN. This plate 1, which is an enlargement of plate 1 that is filed with the application, I wish to offer in evidence.

(The paper above referred to was marked "Applicant's Exhibit A–17.")

Mr. MIGNAULT. Mr. Connolly, have you had plans prepared showing the structure of the proposed dam?

Mr. CONNOLLY. Yes, sir; we have cross sections here.

Mr. MIGNAULT. That was not described in the application.

Mr. CONNOLLY. Yes; we have it here.

Mr. MIGNAULT. I do not wish to interrupt you. The evidence can be made at some other time.

Mr. KEEFER. I am going to offer a friendly suggestion. Have they ever been submitted to the department of public works of Canada? Sooner or later they will have to be submitted to that department.

Mr. VAN KENNEN. I presume so.

Mr. KEEFER. No plans of these proposed works have been submitted to the Government, have they?

Mr. VAN KENNEN. I understand that the engineers have discussed the matter with some of the representatives of the Canadian Government, Mr. Stewart, for instance.

Mr. KEEFER. Our regulations require the minister of public works to approve of such plan. I was wondering if you had taken any steps to obtain such approval.

Mr. VAN KENNEN. No; not yet.

Mr. POWELL. Mr. Keefer, do you mean your remarks to apply to this proposed renewal of the dam or the erection of a new dam, or do you limit your remarks to the connection between Canada Island and Ogden Island?

Mr. KEEFER. As I understand it, there have been no plans of these proposed works submitted, and they will have to be submitted sooner or later to the department of public works of Canada. That would relate more to these compensation works than to any existing dam.

Mr. POWELL. That would apply to the portion of the dam between Canada Island and Ogden Island, which is in Canadian territory?

Mr. KEEFER. Yes; and also the proposed submerged weir; and if there is any extension of this proposed dam, I suppose it would apply to that also.

Mr. VAN KENNEN. We do not for the moment place our hands upon that paper, but we will supply it before the hearing is over.

Mr. LEA. There is a cross section of the power house and a plan which shows all the essential features.

Mr. MIGNAULT. You appreciate, Mr. Van Kennen, that in the order which the commission makes the structures must be described?

Mr. VAN KENNEN. Undoubtedly. Of course, I do not know just what form the order might take, but I have not any doubt that it would take such form as would be necessary to have some idea of the structure.

Mr. MIGNAULT. Yes; that is absolutely essential.

Mr. VAN KENNEN. Mr. Connolly, you have spoken about taking out the obstructions in the Little River. What else is to be done with reference to the Little River?

Mr. CONNOLLY. Developing the Little River to a point where we can use the water that we are allowed to use at the highest degree of commercial efficiency. There comes a point, of course, where it does not pay to increase the channel any more, but for quite a time it will

pay us to increase the size of the channel so as to get more power. We get more power by decreasing the slope of the water and using it under the maximum head.

Mr. POWELL. As a result of that would you consume more water?

Mr. CONNOLLY. No; the same amount of water in any case would be used, but instead of having to use it under a low head we will be able to use it under the maximum fall between the two points.

Mr. POWELL. It is also well known that if you enlarge a stream you get more water flowing through it which you could utilize below.

Mr. VAN KENNEN. I think I had better make that clear at this point. From my remarks yesterday you will probably infer that we believe we are entitled to what we call the natural flow of that stream, which is as nature would have given it to us. Now, that flow depends, of course, upon the stage of the water in the main stream. If there were 250,000 second-feet in the main stream, our natural flow in the Little River would be approximately 25,000 second-feet. If we are entitled to what we maintain we are entitled to, then we ought to have the right to use that 25,000 second-feet in a way that we could get the best result.

We expect that this commission will limit us to what we maintain to be our rights. First, we think we have a right to the natural flow, and, of course, we believe it would be the province of this commission, and we expect, upon that point at least, this commission to say that at a given stage of the water, or when the main river is discharging a certain amount, we are entitled to use 25,000 cubic feet per second, if that happened to be the amount of the natural flow, and that is all we can use. Therefore, Mr. Connolly's answer to you is that he does not expect to use any more; he expects to be limited by this commission to the diversion that he is entitled to take out of that river.

That brings us to the next point. We propose to show by our engineers what the natural flow of the little stream is. Then, as it goes on you will notice that we have asked in our application for a definite amount of water that would be over and above what we think we are legally entitled to. That would be addressed to the favor of this commission, if I want to put it that way, but we believe we are making full compensation for that as a consideration for any additional amount to maintain a steady flow.

Mr. POWELL. To boil it down, you do not want to take any additional water, but you want to increase the efficiency of the water you are taking?

Mr. VAN KENNEN. Yes, sir.

Mr. KING. Is that right?

Mr. MIGNAULT. No; you want additional water. You say you are entitled to the natural flow, but over and above that you want more water?

Mr. VAN KENNEN. Yes. I stand before this commission upon this statement; that the natural flow we believe we are entitled to. Now, we have asked to be allowed to divert additional water up to 30,000 cubic feet. If our natural flow is 27,000 cubic feet we would have at that stage of the water an additional flow of 3,000 cubic feet, and that is all.

Mr. MIGNAULT. I do not follow you. Are you asking for 30,000 second-feet over and above the natural flow?

Mr. VAN KENNEN. No, sir.

Mr. MIGNAULT. That is, if the natural flow amounts to 30,000 second-feet, you ask nothing?

Mr. VAN KENNEN. We ask nothing.

Mr. MIGNAULT. If it amounts to 25,000 second-feet, you want 5,000 additional?

Mr. VAN KENNEN. Yes, sir.

Mr. MIGNAULT. What you want is 30,000 and no more.

Mr. VAN KENNEN. That is what we want. Of course, as I say, the additional 5,000 in the case which the commissioner has mentioned would be asking this commission for the right to divert that much more than we claim we are entitled to.

Mr. MIGNAULT. Would that vary according to the stage of the water?

Mr. VAN KENNEN. It would and our engineers will endeavor to show you just how much at the different stages of the water.

Mr. MIGNAULT. Assuming that in one month the natural flow is 20,000, then you would require 10,000 additional?

Mr. VAN KENNEN. Precisely.

Mr. MIGNAULT. If it is 25,000, you would require only 5,000 additional?

Mr. VAN KENNEN. Yes, sir.

Mr. KING. May I ask one question? Am I not right in understanding if, for instance, 25,000 second-feet are passing at the present time——

Mr. VAN KENNEN. I do not say at the present time, because there are certain artificial obstructions there which obstruct the water at the present time.

Mr. KING. I am merely trying to interpret Mr. Connolly's answer before I get past it. I understood him to say that while you are asking for a limitation up to the natural flow, fixed at 25,000 or 30,000, that would, nevertheless, result in an increased use of water beyond what is being used at the present time.

Mr. VAN KENNEN. There is very little water being used at the present, for the simple reason that our mills are all out of operation in that section. There are only about four mills using water there.

Mr. KING. That is quite clear. It may be 20,000 more than you have now.

Mr. VAN KENNEN. I would not be at all surprised if that might be true, because there may be times when we do not use a drop of water because our mills are not in operation.

Mr. KING. I think I understand it fully.

Mr. VAN KENNEN. Mr. Connolly, is this a correct and accurate photograph of the situation at that point (handing a photograph to the witness)?

Mr. CONNOLLY. Yes; that is absolutely as it exists.

Mr. VAN KENNEN. I want to offer that photograph in evidence.

(The photograph just offered in evidence was marked "Applicant's Exhibit A-18.")

Mr. VAN KENNEN. I show you Applicant's Exhibit A-18, Mr. Connolly. Will you describe what you spoke of as artificial obstructions above your dam and tell us what there is to that?

Mr. CONNOLLY. The first artificial obstruction is a bridge which now connects the island with the main shore.

Mr. MAGRATH. That is the extreme left structure?

Mr. CONNOLLY. Yes, sir.

Mr. POWELL. It is about how far west of the dam?

Mr. CONNOLLY. That is 700 feet west of the present dam.

Mr. VAN KENNEN. Describe that a little more fully.

Mr. CONNOLLY. In our deed we have the right to remove that bridge and substitute a bridge of a different type.

Mr. MIGNAULT. In which of these deeds, Mr. Connolly?

Mr. CONNOLLY. In the main deed. The main deed covers the whole dam all the way across and gives us the right to remove that bridge.

Mr. MIGNAULT. If you could indicate the number of the exhibit, we could refer to it.

Mr. VAN KENNEN. When we come to put in our abstract we will cover that. Now, proceed, Mr. Connolly, and give us a little further description.

Mr. CONNOLLY. That bridge is made of rough bowlders, heavy field stone, just thrown in and topped off with lighter stone, making a communicaion between the main shore and the island. The bridge consists of large field bowlders, with some cribs to support them here and there, and with some openings in it. The openings have been increased and decreased at different times when there were repairs needed on the dam and they have not always been the same. So it has not always been just as it is to-day.

Mr. POWELL. How many openings are there to-day?

Mr. CONNOLLY. There are two openings to-day.

Mr. POWELL. What is the length of it?

Mr. CONNOLLY. The openings altogether are about 80 feet. Then, the water is flowing through the bridge because it is not a tight structure at all; it is just large bowlders and the water flows through.

Mr. MIGNAULT. And there is a roadway across the bridge, is there not?

Mr. CONNOLLY. Yes. We have the right under one of our deeds—I think it is the first deed submitted—to remove that bridge and substitute a different type of bridge with piers so that a greater flow of water will come down.

Mr. GLENN. Does that specify what kind of bridge you shall substitute?

Mr. CONNOLLY. No. It is left to our discretion so long as it shall sustain a load of 10 tons.

Mr. POWELL. Do you say that that obstruction has the effect above of diminishing the diversion there?

Mr. CONNOLLY. Not at the present time because there is about the same amount flowing through the bridge as flows through our dam, but if the dam were removed it would have such an effect.

Mr. KEEFER. How long has the bridge been there?

Mr. CONNOLLY. Oh, I do not know, perhaps 70 or 80 years. Then above the bridge, on the left-hand side of this photograph, you can see a wharf that runs out; a ruined wharf.

Mr. POWELL. How far above this bridge is the wharf?

Mr. CONNOLLY. It is about 200 feet west of the bridge on the main land.

Mr. MIGNAULT. Who owns that wharf?

Mr. CONNOLLY. We have had a lease on it for a great many years. It is owned by an estate there. It has not been in use for many years.

Mr. MIGNAULT. To what estate does it belong?

Mr. CONNOLLY. The Hatch estate.

Mr. MIGNAULT. Do you propose to remove the wharf?

Mr. CONNOLLY. Yes; it is of no use.

Mr. MIGNAULT. But you would require the permission of the owner?

Mr. CONNOLLY. Yes; we have it under lease and we can get that permission. They have offered it to us.

Mr. POWELL. How far does it project into the stream?

Mr. CONNOLLY. It runs out, I should say, about 100 feet or so. It is shallow water at that particular point.

Mr. POWELL. The deep water is beyond?

Mr. CONNOLLY. Yes.

Mr. POWELL. It offers very little obstruction to the flow?

Mr. CONNOLLY. It does not amount to much. It is practically immaterial whether we take it out or not.

Mr. VAN KENNEN. Now, is there anything further?

Mr. CONNOLLY. In addition, in the building of that bridge and wharf there were a great many stones spilled down at different times. I understand that in the building there were many loose rocks that would have to be taken out. We naturally expect to clean that channel up. We know there were bowlders put in artificially in comparatively recent years.

Mr. MIGNAULT. Have you had a survey made of the channel?

Mr. CONNOLLY. Yes.

Mr. GARDNER. Was that bridge originally a public or a private structure?

Mr. CONNOLLY. It has always been private.

Mr. VAN KENNEN. You see all the water-power property, the water-power rights and the island were at one time owned by the same individual. Of course, these matters came along and to protect their interests they reserved the right to remove the bridge in case they needed additional water.

Mr. CONNOLLY. In addition to that, we would want to remove from our tailrace, where we propose to construct the new power house, any necessary amount of rock so we can discharge the water freely through our wheels.

Mr. GLENN. How much excavation do you expect to do in that river?

Mr. CONNOLLY. If the whole 30,000 horsepower is used, the excavation in clay and rock altogether would be over 1,000,000 cubic yards.

Mr. VAN KENNEN. And taking out the obstructions; that includes everything?

Mr. CONNOLLY. Everything.

Mr. KEEFER. That is both above and below?

Mr. CONNOLLY. Yes. It will depend upon the way in which the work is done, but it will be probably from 1,000,000 to 1,250,000 cubic yards altogether, the greater part of it, probably over 90 per cent, will be in the clay.

Mr. GLENN. How much deeper would that make it?

Mr. CONNOLLY. Right where the power house is for a few feet it would go down 10 or 15 feet deeper than it is now, but in the channel above it would not deepen it very much. It would widen it a little and clean it out.

Mr. GLENN. Would not that necessarily entail a larger flow of water?

Mr. CONNOLLY. No; we take the same amount of water but take it at a less velocity. And by taking it at the same velocity there would not be the same slope of the water. The way we propose to use it is to use the water at less velocity than if there were no dam there at the present time. Then, with the remedial works, we propose to put in what you call a training wall, or embankment, connecting the northeast corner of Ogden Island with the southwest or westerly shore of Canada Island. This embankment would follow the crest of the rock shoal which exists there at the present time, and which is not a navigable channel except for low-draft boats, like yachts or skiffs.

Mr. VAN KENNEN. There is no navigation down through that channel at all, so far as commerce is concerned, is there?

Mr. CONNOLLY. No; so far as we can learn any commercial boat that ever got in there got wrecked.

Mr. VAN KENNEN. What is your object in doing that, Mr. Connolly? Of course, I am not asking you as an engineer, but as a practical man. What is the object of putting that in there?

Mr. CONNOLLY. There was a twofold purpose in that. The Canadian Government was fearful of the effect on navigation of our taking that stream if there were no works there, and they desired to be safeguarded against that if possible by putting in some remedial works which would compensate and which would reasonably assure them there would not be a lowering of the water in the main channel. We found by investigation that if this embankment were put in there connecting Ogden Island with Canada Island it would have a twofold effect; it would hold up the water in the main channel and it would also compensate us by slightly lowering the water in our tailrace, by increasing the total fall between headwater and tail-water. We would get advantage in that way by having probably 6 inches more head of water. That is equivalent to about 1,500 horsepower. At the same time we believed we would be conferring a great benefit upon navigation.

Mr. GLENN. Would that raise the water above so as to make navigation better?

Mr. CONNOLLY. Not only will it eliminate that side draft, but it will create a backwater effect, which will go up above and reduce the current and reduce the slope somewhat, thus giving better depth of water on the shallow part of the rapids which is now troublesome.

Mr. MIGNAULT. Let me see if I follow you. Removing the present dam would cause a greater flow in the Little River?

Mr. CONNOLLY. Yes.

Mr. MIGNAULT. And would lower the water in the North Channel and in the Morrisburg Canal?

Mr. CONNOLLY. Yes.

Mr. MIGNAULT. And your idea is to compensate for this lowering of the water. You would construct this embankment between Ogden Island and Canada Island?

Mr. CONNOLLY. Yes, sir.

Mr. MIGNAULT. Because when you referred to the natural flow I understood you to refer to the natural flow as it existed in a state of nature without those structures which have, to a certain degree, modified the state of nature.

Mr. CONNOLLY. Precisely so, Mr. Mignault.

Mr. POWELL. But with the obstructions from ice deposits?

Mr. CONNOLLY. Yes.

Mr. POWELL. That would be a natural condition?

Mr. CONNOLLY. Yes.

Mr. GLENN. What is there at point E?

Mr. CONNOLLY. That is a further remedial work. There is a channel at that point E opposite Lock 24, which happens to be excessively deep. There are over 40 feet of water there. We thought we could take some of the rock and very heavy material out of the intake which we propose to dredge and use that as a dumping ground, and dump that, to a certain extent, so as to obstruct the flow there. That would have a backwater effect and give us a little more water.

Mr. GLENN. What effect would that have on the St. Lawrence River?

Mr. CONNOLLY. It would raise it a few inches at that point.

Mr. GLENN. It would not interfere with navigation?

Mr. CONNOLLY. Not a particle.

Mr. GARDNER. What is the average depth of water down through that North Channel, going down to where you propose to put in this embankment?

Mr. CONNOLLY. The average depth would probably be somewhere in the vicinity of 30 feet.

Mr. VAN KENNEN. There is one point—and I expected to prove that by the engineers largely—where it is shallower, and that is one of the things we are trying to guard against—that is, taking the water off of this shallower bar; but it is only a narrow neck in the North Channel.

Mr. CONNOLLY. You asked me the average depth, Mr. Chairman. There are places where it is very much deeper, and there is this point where there is a narrow barrier of rock which crosses the river and is the cause of the rapids. There is a great deal less water there than anywhere else in that vicinity.

Mr. VAN KENNEN. The canal-sized boats draw how much water?

Mr. CONNOLLY. Fourteen feet.

Mr. VAN KENNEN. When the water gets down to a low stage, where over the sill of the lock—the entrance there—there is enough water to carry a boat of that size, there would be slightly less water on that point that you are speaking about?

Mr. CONNOLLY. Yes; there is a relation between them which our engineers will explain.

Mr. VAN KENNEN. Now, your object in putting in the embankment at D is to elevate the water over this place where there is this shallow spot that you are speaking about?

Mr. CONNOLLY. Yes. It deepens the water over that shallow point, and it checks the water and makes it better for navigation both ways.

Mr. VAN KENNEN. At E you put the submerged weir. You are not asking our permission to put that submerged weir so it would interfere at all with navigation?

Mr. CONNOLLY. No.

Mr. VAN KENNEN. Over the top of this weir there would be more water than there is in the canal?

Mr. CONNOLLY. Yes. There would be probably 25 or 30 feet of water.

Mr. MIGNAULT. There are several questions, Mr. Van Kennen, that I would like to put, but I think they would be proper questions for an engineer to answer. It would be very useful if we had a description of these structures.

Mr. VAN KENNEN. We expect the engineers to put that in. Now, I think that is all.

Mr. KEEFER. Mr. Connolly, if I understand you rightly, you are asking for the natural flow of that stream plus whatever more will bring it up to 30,000 feet per second?

Mr. CONNOLLY. Yes.

Mr. KEEFER. And you want to be permitted to pass the 30,000 feet per second and develop it into power in the most efficient manner?

Mr. CONNOLLY. Yes.

Mr. KEEFER. And to-day the quantity that you are passing is variable on account of the fact that sometimes the mills are running and sometimes they are not?

Mr. CONNOLLY. Yes.

Mr. KEEFER. And to-day that quantity that is being passed does not exceed what at its maximum?

Mr. CONNOLLY. I have seen it up to 5,000 or 6,000 feet. That depends on the stage of the water.

Mr. KEEFER. So that the maximum stage of water that is being passed to-day never exceeds 5,000 or 6,000 feet and sometimes drops infinitesimally. In order to do this you want to remove the obstructions of the river that lie in the channel, so that this water will come there at its greatest head?

Mr. CONNOLLY. Yes.

Mr. KEEFER. And then, in order not to interfere with that head, you are contemplating putting this dam across from Canada Island so as to have the greatest benefit of that water, and not diminish your head?

Mr. CONNOLLY. Yes.

Mr. KEEFER. Then, in addition to that, more as a matter of convenience, I take it from your evidence, you want to be permitted to use this deep part of the river as a dumping ground, and, incidentally, you think that thereby you may improve navigation?

Mr. CONNOLLY. I would put it the other way around. It happens that it is a convenient place to put this heavy material that we propose to excavate. We can put it there very conveniently to ourselves and navigation. We can kill two birds with one stone. I will put it in this way: That even had we not had that material we would have suggested this work, if we had to bring it from a greater distance, and at greater expense.

Mr. KEEFER. Now, I think I understand what you are asking for. As yet you have not filed plans with the Canadian authorities?

Though you have discussed the matter with Mr. Stewart, you have not filed any definite plans as to what these so-called compensation works are?

Mr. CONNOLLY. No, sir.

Mr. KEEFER. And you have not asked for the approval thereof?

Mr. CONNOLLY. No, sir.

Mr. KEEFER. Coming then again to this documentary evidence that has been put in, and laying aside the question of the deeds of conveyance between you and your associates, I want to make particularly clear what statutory authority you have. So far I have heard of only two acts, one in 1808, which is the act that gave you the power to improve navigation there by virtue of building this lock and using the surplus water for power purposes?

Mr. CONNOLLY. Yes.

Mr. KEEFER. And then the act of 1826, which my learned friend calls the confirmatory act?

Mr. VAN KENNEN. That is the title to the act.

Mr. KEEFER. I am not able to see the confirmation in it that you draw.

Mr. VAN KENNEN. Well, that is a matter of title.

Mr. KEEFER. Those are the only two public documents under which you claim title, if I understand it rightly?

Mr. CONNOLLY. Yes, sir.

Mr. KEEFER. And the bridge you wish to remove?

Mr. CONNOLLY. Oh, yes; it would be necessary in order to make this development.

Mr. KEEFER. And you are not able to say by whom that bridge was built, except that it was built by private parties? It was not built by any municipal corporation?

Mr. CONNOLLY. No; it was built for the Ogdens, by an English engineer.

Mr. KEEFER. And I suppose that name would give you approximately when it was built. You said some time about 70 years ago?

Mr. CONNOLLY. That is our understanding.

Mr. MIGNAULT. Is that bridge being used for traffic?

Mr. CONNOLLY. Just to supply the farms. It is the only present access to the island.

Mr. KEEFER. The Morrisburg Canal, which has been spoken of, is practically on the opposite side from this dam and these works on the Canadian side?

Mr. CONNOLLY. Yes.

Mr. KEEFER. And the entrance to it would be just a little above where you propose to put this submerged weir?

Mr. CONNOLLY. Yes.

Mr. KEEFER. Do you remember when that Morrisburg Canal was built?

Mr. CONNOLLY. It was commenced about the year 1841. It was opened for navigation about the year 1849. That was for a 9-foot navigation. It was used by vessels drawing from 7 to 9 feet until about 1899. They commenced the reconstruction of the canal about the year 1885 or 1886, but they were a great many years in reconstructing the locks in the canal; so that it was only suitable for navigation about the year 1900. That is the present Morrisburg Canal

as it exists to-day. It was only opened for 14-foot navigation about 14 or 15 years ago.

Mr. KEEFER. At that time the present dam, with its water-power privileges, existed about as it is there to-day?

Mr. CONNOLLY. Yes. That present dam was built and operated 43 years before the first navigation canal in the St. Lawrence River was built.

Mr. KEEFER. Just following up the canal system; of course, you as a public man, well versed in public affairs, know that in addition to the two canals that you have spoken of on the St. Lawrence, the question of a deep waterway to the ocean is a live one in Canada, so much so that we have started building a canal commonly called the Welland?

Mr. CONNOLLY. Yes; they abandoned it.

Mr. KEEFER. It is not abandoned, but we have stopped construction.

Mr. CONNOLLY. There is a chunk as big as this table that has fallen into the canal.

Mr. KEEFER. Yes; we will not go into the details of that, but we have started on the expenditure of $50,000,000 on that one, and necessarily deep-water navigation will involve the improvement of the St. Lawrence River?

Mr. CONNOLLY. Yes. I can not say what the Government has in mind. I think it should have made up its mind a great many years ago, but the Canadian Government usually in its wisdom takes about a century to make up its mind to anything.

Mr. KEEFER. That is always our privilege. But they have a deep water system in view and it is of considerable magnitude.

Mr. CONNOLLY. It should be; yes.

Mr. TAWNEY. Mr. Connolly, it is also true, is it not, that the improvement in deep-water navigation from tidewater to the Lakes between Canada and the United States has been under contemplation ever since 1872, when the International Commission was created for that purpose?

Mr. CONNOLLY. Yes.

Mr. TAWNEY. And there have been numerous reports made by different commissions, both national and international?

Mr. CONNOLLY. Yes.

Mr. KEEFER. You contemplate, then, by getting this 30,000 cubic feet per second to practically develop 30,000 horsepower instead of 5,000 or 6,000?

Mr. CONNOLLY. Approximately, yes.

Mr. KEEFER. You are not an engineer, but you may be familiar with it; do you know whether at this particular point—not where your actual dam is, but in that neighborhood—it is a mooted question whether it is not advisable to develop a large quantity of horsepower?

Mr. CONNOLLY. It has been discussed.

Mr. KEEFER. What would be the capacity, roughly speaking, of the St. Lawrence at that point?

Mr. CONNOLLY. I will answer you in a little different way. That depends upon the contours which are now being run.

We have carried the contour lines on both sides of the stream for a good many miles. The Hydroelectric Commission of Ontario, the work of which you are all familiar with, is now continuing that work and carrying the contour lines up as far as the Lake Ontario levels for the purpose of ascertaining as closely as possible what the possibilities are.

Mr. KEEFER. Do you mean bringing the water to the level of Lake Ontario at that point?

Mr. CONNOLLY. Yes. We have carried the work far enough to know that there are a great many practical questions in it. Such a thing as bringing the water at that point to the level of Lake Ontario they might as well dismiss from their minds right now. It can not be done.

Mr. MAGRATH. What is the difference in elevation?

Mr. CONNOLLY. The difference in elevation from the water above our dam to the level of Lake Ontario was 19 to 21 feet.

Mr. KEEFER. Do you know of questions of difficulty other than flowage rights?

Mr. CONNOLLY. The governing question there is a cross section of the channel from that point to Lake Ontario and the necessary slope of the river.

Mr. KEEFER. Do you know also of any proposed contemplation of a regulated dam at this point of the waters of Lake Ontario for the benefit of the waters of Montreal?

Mr. CONNOLLY. I have heard it spoken of, but if they think for one minute that the State of New York and the Province of Ontario are going to permit Lake Ontario to be used as a means of regulating the height of water in the harbor of Montreal, they have another think coming.

Mr. KEEFER. We will leave that to the engineers.

Mr. VAN KENNEN. Of course, there is a limitation in our application. We do not ask for the 30,000 cubic feet when it at all interferes with navigation as we understand it to date.

Mr. POWELL. In other words, it is subject to navigation?

Mr. VAN KENNEN. It is subject to navigation and it is under control of this commission. If I understand the powers of this commission they are rather broad; the commission can say, "You can take the water at such and such a time for such and such a purpose, and if it is going to interfere with navigation you can not take it." We are perfectly willing to submit our rights to this commission.

Mr. GARDNER. How much water was used when the present dam was working at its highest point of efficiency? Have you any idea?

Mr. CONNOLLY. No. At that period there was nothing known about the water. In getting this property together I was instrumental in purchasing something like 23 mills and factories which had been in actual operation at one time there. The ruins of them are all visible there to-day.

Mr. VAN KENNEN. In your investigation and studies did you take the photograph accurately and correctly of the old lock of the old canal that was constructed under the act of 1808?

Mr. CONNOLLY. Yes.

Mr. POWELL. What lock was that?

Mr. VAN KENNEN. That was the lock in the old dam constructed pursuant to the act of 1808. I want to put that in evidence. (Marked "Applicant's Exhibit A–19.") I also want to put in evidence a photograph of the old lock gates. (Marked "Applicant's Exhibit A–20.")

Mr. MIGNAULT. You stated, I think, that the canal was in operation until the Morrisburg Canal was built?

Mr. VAN KENNEN. Approximately. I understand that to be so. There was one time when there was a freshet there that tore out a part of the dam, and a part of the canal went out; but that was only a short time before the Canadian canal was constructed.

Mr. CONNOLLY. It was after the Canadian canal was constructed in the spring, and the ice knocked out a piece of the dam and tore away the lock, and it was not replaced.

Mr. MAGRATH. Mr. Connolly, I understand that the titles that have been submitted here this morning give either your company or yourself, in trust for the company, the right to take a certain percentage of the flow of that stream which you referred to as the natural flow?

Mr. CONNOLLY. Yes; practically the whole of it.

Mr. MAGRATH. The whole of the Little River?

Mr. CONNOLLY. Yes.

Mr. MAGRATH. And which is a variable quantity?

Mr. CONNOLLY. Oh, yes.

Mr. MAGRATH. Depending for the rest on the main river?

Mr. CONNOLLY. Yes.

Mr. MAGRATH. Which you have fixed at 30,000 second-feet?

Mr. CONNOLLY. The average flow, as near as our engineers can estimate it, of that Little River, if there were no artificial obstructions in it, would be from 25,000 to approximately 30,000 second-feet.

Mr. MAGRATH. What proportion of the entire flow of the stream is that?

Mr. CONNOLLY. That is variable. At extremely low-water periods the percentage is less than at high-water periods. It runs from 10 to 16 per cent at low water.

Mr. MAGRATH. What amount of water goes through now?

Mr. CONNOLLY. There is never more than about 6,000 feet.

Mr. MAGRATH. What percentage is that?

Mr. CONNOLLY. That would be about 2 to 3 per cent.

Mr. MAGRATH. So you claim the right to a variable amount of water, running from 10 to 16 per cent?

Mr. CONNOLLY. Yes.

Mr. MAGRATH. Whereas there has been going through there only how much?

Mr. CONNOLLY. There is only about 2 per cent at present. There had been a very much higher flow than that when these mills were in operation. One was a large paper mill.

Mr. MAGRATH. How long ago was that?

Mr. CONNOLLY. That was torn down about 30 or 40 years ago.

Mr. MAGRATH. But recently the Little River has been carrying about 2 per cent?

Mr. CONNOLLY. From 2 to 4 per cent.

Mr. MAGRATH. Whereas you claim that you have a legal right to take from 10 to 16 per cent?

Mr. CONNOLLY. Yes.

Mr. KEEFER. It seems to me that outside the engineering evidence we have the case before us now. It will be largely a matter of argument now, subject to the testimony of the engineers.

Mr. VAN KENNEN. Yes.

Mr. POWELL. You do not attach your rights to any conveyances except as an incident to the land conveyed?

Mr. VAN KENNEN. I do not know that I quite understand the commissioner.

Mr. POWELL. That is, your right is a proprietary right to use that water in its natural condition as it would flow to the land.

Mr. VAN KENNEN. Yes; I think so. We claim that we have some additional rights by legislation. Under these statutes we claim additional rights, and, of course, we have used it for over 100 years.

Mr. POWELL. And they reply to that that these have run out; that the franchises, so to speak, are exhausted.

Mr. VAN KENNEN. I take it that they will want to raise that question, but in our State you can obtain prescriptive rights.

Mr. KEEFER. We are not here to attack the rights. Whatever you have you should have, but we do not want to have to give you something more and then have to buy it back again.

Mr. POWELL. Can you acquire prescriptive rights against the State?

Mr. VAN KENNEN. Yes, sir; under our laws.

Mr. POWELL. By virtue of your legislation?

Mr. VAN KENNEN. No, sir; by virtue of user.

Mr. MIGNAULT. Can you acquire a prescriptive right against your title?

Mr. VAN KENNEN. If we had the title, we would not want a prescriptive right.

Mr. MIGNAULT. No. Perhaps you do not get my question. Assuming that you have a title that will end, say, in 75 or 100 years, can you acquire a prescriptive right against your title?

Mr. VAN KENNEN. I would not think so. I might answer that in this way: If your prescriptive were a grant which terminated at a certain time, then, if you antedated that grant, you could acquire a prescriptive right.

Mr. MIGNAULT. Probably that is a matter of argument. We will hear you later on that question.

JOHN S. RUTHERFORD, a witness produced for and on behalf of the applicant, after being first duly sworn, was examined and testified as follows:

Mr. VAN KENNEN. Where do you live, Mr. Rutherford?

Mr. RUTHERFORD. In Waddington.

Mr. VAN KENNEN. How long have you lived in Waddington?

Mr. RUTHERFORD. With the exception of a year and a half, I have always lived there.

Mr. VAN KENNEN. How old are you?

Mr. RUTHERFORD. I will be 70 this month.

Mr. VAN KENNEN. Are you familiar with the situs of this water-power project there?

Mr. RUTHERFORD. I am.

Mr. VAN KENNEN. Have you been familiar with how it has been used ever since you were a boy?

Mr. RUTHERFORD. Yes, sir.

Mr. VAN KENNEN. Will you narrate briefly what uses they have made of that water power, beginning at your earliest recollection?

Mr. RUTHERFORD. Do you want me to tell you the different plants that have been there?

Mr. VAN KENNEN. Yes; briefly.

Mr. RUTHERFORD. Commencing on the island side, the first was a sawmill and a shingle mill together under the same roof.

Mr. POWELL. At what point?

Mr. RUTHERFORD. At the island side of the dam.

Mr. POWELL. At the dam?

Mr. RUTHERFORD. Yes; at the dam. The next was a paper mill.

Mr. VAN KENNEN. How long was that paper mill there, according to your best recollection?

Mr. RUTHERFORD. Well, it was nearly as long as I can remember. I do not remember when the shingle and saw mill was built.

Mr. VAN KENNEN. How long do you remember it being there in operation?

Mr. RUTHERFORD. At least 20 years.

Mr. VAN KENNEN. You mean, you remember its being in operation 20 years?

Mr. RUTHERFORD. Yes, sir.

Mr. VAN KENNEN. What happened then?

Mr. RUTHERFORD. They turned it into a butter factory; and then Mr. Crapser got it. That was more than 20 years ago.

Mr. VAN KENNEN. How long did it last?

Mr. RUTHERFORD. I think it lasted about 6 or 8 years as a butter factory, and there was a grist mill in connection with it.

Mr. VAN KENNEN. Was the grist mill operated by water power?

Mr. RUTHERFORD. Certainly.

Mr. VAN KENNEN. How long did that last?

Mr. RUTHERFORD. It lasted, I think, nearly three years.

Mr. VAN KENNEN. What finally became of that building?

Mr. RUTHERFORD. The foundation is there yet. The buildings are gone.

Mr. VAN KENNEN. When was it last used, according to your best recollection? About how many years ago?

Mr. RUTHERFORD. It was last used as a creamery or butter factory by Mr. Crapser about 16 years ago.

Mr. VAN KENNEN. Coming southerly toward the main shore, what was next factory?

Mr. RUTHERFORD. It was a paper mill.

Mr. VAN KENNEN. Was that a paper mill from your earliest recollection?

Mr. RUTHERFORD. It was. The first I can remember the building it was a large gristmill. It used to be used as a flour mill by the Ogdens. They used to bring their wheat from the West and lock

it through the drawbridge. Then H. R. James bought it and made it over into a paper mill.

Mr. VAN KENNEN. How many years was that used as a paper mill?

Mr. RUTHERFORD. That was in 1863. They used it 20 years, when he died.

Mr. VAN KENNEN. After that what happened?

Mr. RUTHERFORD. The mill burned down.

Mr. VAN KENNEN. That was operated by water power?

Mr. RUTHERFORD. Yes, sir.

Mr. VAN KENNEN. What was the next?

Mr. RUTHERFORD. It was a flax mill. It formerly was a straw paper mill. In years before they made what they called strawboard.

Mr. VAN KENNEN. How long do you recall that mill having been used?

Mr. RUTHERFORD. The flax mill?

Mr. VAN KENNEN. Yes.

Mr. RUTHERFORD. It was not used over six or eight years.

Mr. VAN KENNEN. What use was made of it after that?

Mr. RUTHERFORD. It was torn down. The paper mill used it for a storehouse for a number of years.

Mr. VAN KENNEN. Then it went out of use, did it, about the same time that the paper mill went out of use?

Mr. RUTHERFORD. Yes.

Mr. VAN KENNEN. Now, then, come farther across.

Mr. RUTHERFORD. There was a woolen mill there.

Mr. VAN KENNEN. How long was that operated?

Mr. RUTHERFORD. It was in operation there when I was a mere boy, probably 10 years old.

Mr. VAN KENNEN. How long was it in operation either as a woolen mill or some other mill?

Mr. RUTHERFORD. About 10 years.

Mr. VAN KENNEN. What went with that?

Mr. RUTHERFORD. It went like the rest of them, tumbled down.

Mr. VAN KENNEN. Now, go on to the next.

Mr. RUTHERFORD. The next was a spoke mill. It formerly was a flax mill. It was used in connection with this other one as a flax mill. Then they turned it into a spoke factory. It was run about 10 or 12 years as a spoke factory.

Mr. VAN KENNEN. After that, what happened to it?

Mr. RUTHERFORD. It went the way the rest did.

Mr. VAN KENNEN. That would bring it about to what time?

Mr. RUTHERFORD. About 20 years ago.

Mr. VAN KENNEN. Then, what next, Mr. Rutherford?

Mr. RUTHERFORD. The next was another sawmill.

Mr. VAN KENNEN. How long was that operated?

Mr. RUTHERFORD. As long as I can remember the sawmill was there.

Mr. VAN KENNEN. When did that mill go out of operation? About how long ago?

Mr. RUTHERFORD. Soon after the paper mill.

Mr. VAN KENNEN. Then, coming over toward the shore, what was the next?

Mr. RUTHERFORD. There was another woolen mill there, belonging to the Dorans, a small stone building close by, and they did use the other mill to a certain extent as a store mill. The next was the Holland flour mill. That is right on the corner of the dam and the canal.

Mr. VAN KENNEN. There was a canal constructed from the dam diverting the water from the dam?

Mr. RUTHERFORD. Down the south side; yes, sir.

Mr. VAN KENNEN. That was in operation how many years ago?

Mr. RUTHERFORD. As long as I can remember.

Mr. VAN KENNEN. That burned only a few years ago?

Mr. RUTHERFORD. About 12 or 15 years ago.

Mr. VAN KENNEN. Now, on the canal were there several plants?

Mr. RUTHERFORD. There are only two there now.

Mr. VAN KENNEN. I say, were there several there at one time?

Mr. RUTHERFORD. Certainly.

Mr. VAN KENNEN. Enumerate them.

Mr. RUTHERFORD. The first was a sash and door and planing mill. And the next was another grist mill.

Mr. VAN KENNEN. That is still in existence?

Mr. RUTHERFORD. It is standing there. The walls are there and the machinery is in it, but the end has fallen out of it. That is next to the planing mill.

Mr. VAN KENNEN. Well, while you are speaking about this grist mill, that had been in operation up to about five or six years ago, had it not?

Mr. RUTHERFORD. I think about seven years.

Mr. VAN KENNEN. What other factories were in there?

Mr. RUTHERFORD. The next to that was a shingle mill and a tub factory, where they made butter tubs and cut shingles. The next to that was a blacksmith shop and machine shop.

Mr. VAN KENNEN. And they operated by water power?

Mr. RUTHERFORD. Yes; everything was run by water power then.

Mr. VAN KENNEN. Was there anything else?

Mr. RUTHERFORD. Next to that there was a foundry. The next was a blacksmith shop and what we called the trip-hammer shop.

Mr. VAN KENNEN. They made use of water power in the operation of that?

Mr. RUTHERFORD. Yes. The next was a tannery on the canal, and the next was a carriage factory, quite a large carriage factory, where they made carriages and wagons. Next to that there were two carriage factories quite close together, just a passageway between them, and below that was the shingle mill and the butter-tub factory.

Mr. VAN KENNEN. Now, of course, that has all changed within your recollection until there are only a few plants operated there at the present time?

Mr. RUTHERFORD. There is nothing now in operation but a little sawmill and a blacksmith shop on the canal.

Mr. VAN KENNEN. On the dam?

Mr. RUTHERFORD. There is nothing but a little power plant belonging to the Ontario Power Co.

Mr. VAN KENNEN. That is practically the present situation?

Mr. RUTHERFORD. Yes.

Mr. VAN KENNEN. Some of them have been operated as late as six or seven years ago?

Mr. RUTHERFORD. Yes.

Mr. VAN KENNEN. And from that one by one they have been diminishing as you go back?

Mr. RUTHERFORD. Yes. On the end of the canal the last privilege used to be a blast furnace.

Mr. VAN KENNEN. Is that in operation now?

Mr. RUTHERFORD. No, it has not been in operation for as long as I can remember. The walls are there, and the old foundation is there, and also a lot of ore lying around the yard where they used to mill it.

Mr. MAGRATH. What is the population of Waddington now?

Mr. RUTHERFORD. I can not tell you the population of the town. The population of the village is about 750.

Mr. VAN KENNEN. Have you a historical sketch of that?

Mr. RUTHERFORD. I have an old sketch. [The witness produced an old book.]

Mr. VAN KENNEN. It gives only a historical account of these various enterprises that took place. Mr. Keefer, would you like to ask Mr. Rutherford any questions?

Mr. KEEFER. The canal that you spoke of was destroyed by fire 12 or 15 years ago?

Mr. RUTHERFORD. No, sir.

Mr. KEEFER. What are the facts about the canal?

Mr. RUTHERFORD. It has just merely dropped away. It was a stone wall faced with wood, and the wood has rotted away.

Mr. KEEFER. How long has it been since the canal was operated?

Mr. RUTHERFORD. It is operated now to a certain extent.

Mr. KEEFER. For boats to go through?

Mr. RUTHERFORD. No; this was the power canal.

Mr. KEEFER. Do you recall a lock ever being in there?

Mr. RUTHERFORD. Yes, sir.

Mr. KEEFER. Was it ever used, to your recollection?

Mr. RUTHERFORD. It was used.

Mr. KEEFER. Do you recall it being used?

Mr. RUTHERFORD. Not in my time.

Mr. KEEFER. You have no knowledge to give us on that point?

Mr. RUTHERFORD. No, I have not. The dam went out in my time, and took out this old lock that was there and an acre and a half of the island.

Mr. KEEFER. So that was due, then, to some accident, and the canal and the lock system were washed away?

Mr. RUTHERFORD. Yes.

Mr. KEEFER. About how long ago was that accident?

Mr. RUTHERFORD. That has been nearly 60 years ago. I was a small boy when that was done.

Mr. KEEFER. Prior to that it was used?

Mr. RUTHERFORD. No, it went out once before that. It was a wooden lock and it went out, and they built a stone lock.

Mr. KEEFER. It was used 60 years ago?

Mr. RUTHERFORD. I know of its not being used within 60 years, but my memory would not go back farther than that.

Mr. TAWNEY. What has not been used for 60 years?

Mr. RUTHERFORD. The old lock there at the end of the dam.

Mr. KEEFER. And the lock was intended for use only in respect to navigation?

Mr. RUTHERFORD. That was all.

Mr. POWELL. The user of water for purposes of power, I suppose, secured his authority from the proprietors under whom you claim, Mr. Van Kennen?

Mr. VAN KENNEN. Yes, sir.

Mr. POWELL. There was no adverse user?

Mr. VAN KENNEN. There was no adverse user, as I understand it. I will now call Mr. Lea.

RICHARD S. LEA, of Montreal, Canada, produced as a witness for and on behalf of the applicant, after being first duly sworn, was examined and testified as follows:

Mr. VAN KENNEN. Mr. Lea, you are an engineer?

Mr. LEA. Yes, sir.

Mr. VAN KENNEN. And you have been for how many years?

Mr. KEEFER. Mr. Lea has been before the commission several times, and we know all about him.

Mr. LEA. I would like to qualify on this question, if I may, because the question of backwater comes in, and I happen to have had a lot of experience in that connection with this river and other rivers.

Mr. TAWNEY. You may proceed.

Mr. LEA. I have made hydraulic investigations, including backwater calculations and observations, in connection with the whole stretch of the St. Lawrence from Lake Ontario to Montreal, including all the rapids. That work was done for various corporations such as the Light, Heat & Power Co. and others in connection with the Lachine Rapids and the rapids between Lake St. Louis and Lake St. Francis, and for what was then known as the transportation interests, meaning the people who operated steamships on the St. Lawrence about 10 years ago. At that time I made an investigation for them of the Long Sault. That investigation was made in connection with the application of the St. Lawrence Power Co. for the development of the Long Sault power, and I had all of the hydraulic data pertaining to the river at my disposal. I spent many months investigating the Ottawa River for the various power interests at Ottawa in connection with the division of the water at that point, and also farther down at Carillon on the Ottawa. I have also made investigations in connection with the Lake of the Woods matter for the hydroelectric department of the city of Winnipeg and the Winnipeg Street Railway, of portions of the Winnipeg River; and on the Bow River in connection with the construction of the Calgary Power Co.'s plant. I have investigated the flow at the Basanno Dam; and also of the Fraser River in British Columbia. In the last 30 years I have spent a great deal of my time in making hydraulic investigations and checking up my calculations by actual observation of facts. This is merely preparatory to the statement that a part of this matter depends upon the question of backwater. That is what this wing dam provides to benefit navigation in the Rapids plat.

Mr. MAGRATH. These investigations that you carried on have all been for private parties? Has any of this work been in connection with the Government?

Mr. LEA. Yes; the Ottawa investigations were for both the provincial government and the Dominion Government indirectly, as they were all interested. I do not think any of the work I have mentioned on the St. Lawrence was directly for the Government. However, I think I did some work on the Winnipeg River that was pretty nearly directly for the Government.

Mr. VAN KENNEN. Was it for the municipality?

Mr. LEA. No; it was an investigation for this commission of the hydraulics of the Winnipeg River, and I was acting jointly for the Winnipeg Street Railway and the city of Winnipeg, but I worked also with the hydraulic engineers of the Province of Ontario and the Dominion Government.

Mr. TAWNEY. These investigations that you have made were partly for and at the instance of the public as well as private interests?

Mr. LEA. Nearly always for public utilities.

Mr. VAN KENNEN. I suppose we are interested more in knowing whether or not Mr. Lea's conclusions are correct.

Mr. TAWNEY. There is nobody on the commission that questions his ability as an engineer.

Mr. MAGRATH. To be very frank, there is a feeling in Canada that there is a public viewpoint and a private viewpoint; that the engineer employed continually by private interests has certain views, and the engineer employed by public interests has certain views.

Mr. VAN KENNEN. Now, Mr. Lea, I would like to have you tell what investigations you have made, what conclusions you have reached with respect to what we call this embankment or dam between Ogden Island and Canada Island, and what effect it will have upon the stream flow, the elevation of the water, and navigation, so far as you are qualified to speak on those points.

Mr. MIGNAULT. Are you assuming there the reconstruction of the existing dam?

Mr. VAN KENNEN. Yes, sir; fitting into this project.

Mr. POWELL. Either the reconstruction of the existing dam or the erection of another in its place.

Mr. MIGNAULT. The reconstruction at point A or point B of a dam which has not yet been described. If Mr. Lea can give us a description of the whole works, we would like to put it in the record.

Mr. VAN KENNEN. I think he can give you a description of this proposed dam.

Mr. MIGNAULT. You are not beginning strictly at the beginning when you ask Mr. Lea about this embankment between Ogden Island and Canada Island. That is to compensate for something which has not yet been described.

Mr. VAN KENNEN. I think it is very proper in that way, but your speaking about it was the only thing that led me to ask that question.

Mr. POWELL. You had better commence with a general description of what is involved.

Mr. VAN KENNEN. All right; go ahead, Mr. Lea.

Mr. LEA. As a matter of fact, if I had answered Mr. Van Kennen's question, I would have begun this way. My connection with the enterprise was largely to determine what effect the development of the power in the Little River would have on the levels of the main river in the vicinity, and, naturally, on navigation.

Mr. POWELL. Begin with the scheme.

Mr. LEA. The resident engineer who has been there for 10 years and who has studied this matter winter and summer furnished me with whatever data I used. The bulk of it was already collected. I found the Little River existing, as it is shown there on plate 1, as an original second branch of the St. Lawrence at that point; that is, the river over 100 years ago flowed to the south of Ogden Island as well as to the north, but that also over 100 years ago a dam had been placed across the Little River and practically made the main river a single channel there, with a small power plant on the other channel; that is, the southern channel was blocked artificially.

Mr. MIGNAULT. Which had the effect of raising the water in the main channel?

Mr. LEA. It, of course, raised the water at the upper end and all down through the rapids until it got below Lock 23, which in plate 1 is the lower lock in the canal. When I refer later on to Lock 23 or Lock 24 I refer to the Morrisburg Canal with Lock 23 at the lower end and Lock 24 at the upper end.

The proposal of the company was to replace the power house, which had been built there and which had gone to ruin, by a modern hydroelectric plant which would produce electricity and transmit it around the country. To do that they had to do as with every other hydroelectric proposition; they had to provide a headrace for bringing the water to the power house and a tailrace for carrying the water away from it. In this case the power house crosses the river and entirely fills it; at any rate, it will if we develop anywhere near 30,000 horsepower. In many cases the headrace has to be largely excavated and sometimes entirely so by artificial means, as, for instance, a plant like that at Massena, where the headrace was entirely an artificial channel; and many others all over the country. That all depends on the local conditions; and sometimes the tailrace also has to be largely excavated. In this case, however, the headrace and the tailrace are largely provided by nature, and all that the company has to do in the way of excavation is to make the headrace and the tailrace large enough; that is, to increase the channel which is there by nature, and thus complete their power development. Besides bringing the water to the power plant, the question also arose in my mind as to how much water went through this southern channel in a state of nature before there was any dam or bridge there. That was over 100 years ago, and it is rather difficult to answer very definitely. A sufficient number of cross sections were furnished me by Mr. Tucker, for the purpose of calculating the flow, which I did, the figures being shown on Plate II of the application of the New York & Ontario Power Co.

Mr. MIGNAULT. I see, Mr. Lea, that this is supposed to indicate the capacity of the Little River, showing its natural flow in cubic feet per second.

Mr. LEA. Yes, sir.

Mr. MIGNAULT. The term "natural flow" has been used by Mr. Van Kennen as indicating what would be the flow in a state of nature without any obstruction.

Mr. LEA. Yes.

Mr. MIGNAULT. Is it used in the same sense here?

Mr. LEA. Yes.

Mr. MIGNAULT. It is not the actual flow; it is the natural flow in a state of nature with all these obstructions taken out?

Mr. LEA. Yes, sir. The present flow is a mere accident. The quantity of water available naturally is that part of the total flow of the St. Lawrence River which would flow through the Little River if the dam and the roadway were removed, together with the débris of various kinds which has accumulated there during the past 100 years. That means simply that if they were to tear everything out, the bridge and the old dam and all the rest of the obstructions, and return it to the condition in which it was, say, in 1750, we would get the natural flow.

Mr. POWELL. You mean artificial obstructions?

Mr. LEA. Yes; anything that has been put in there artificially or by nature.

Mr. MAGRATH. You are adjusting yourself to what these gentlemen claim are their legal rights?

Mr. LEA. Well, the actual water that flowed down that river in a state of nature before any artificial obstructions were placed there and before any natural obstructions were permitted to place themselves there.

Mr. MIGNAULT. And without any dredging of the channel?

Mr. LEA. Without any dredging of the channel; leaving everything as in a state of nature; without any artificial obstructions or any natural obstructions which accumulated there on account of these artificial obstructions.

Mr. TAWNEY. Mr. Lea, if it were not for the artificial obstructions, would not nature itself keep that stream clear from other obstructions?

Mr. LEA. Yes; I suppose it would. That is really what, in my opinion, is the natural flow—what flowed down there before any artificial obstructions had been placed there.

Mr. POWELL. We had a statement yesterday that there was ice that brought down and deposited bowlders, which had a considerable effect. Those would have been natural obstructions and not artificial obstructions. If you went back 2,000 years there might be none there and you would have a great big stream. You must take it as nature has it.

Mr. MIGNAULT. The water of the Little River flows down from the main St. Lawrence River south of Ogden Island, and the first obstruction, leaving aside the bowlders, is that bridge?

Mr. LEA. The first artificial obstruction that amounts to anything.

Mr. MIGNAULT. The second obstruction would be the dam. I understand the intention is to put in another dam, at all events?

Mr. LEA. Yes.

Mr. MIGNAULT. You consider the natural flow to be the flow which would arise at the point of the dam now existing or which you may put in if there were no obstructions above?

Mr. LEA. No; what I mean by the natural flow is if there were no dam whatever. I mean the quantity of water that would flow in a state of nature down the south channel of the river.

Mr. MIGNAULT. You are going to put in a dam, or the company is, which will be an obstruction in the river?

Mr. LEA. Yes, sir. With that dam we can control it and let no water at all go down, if we please.

Mr. MIGNAULT. And I presume you would have a power house on the dam?

Mr. LEA. Yes, sir; that is the intention.

Mr. MIGNAULT. And the water would be discharged from the power house into the Little River?

Mr. LEA. Into the lower part of the Little River.

Mr. MIGNAULT. Therefore the natural flow would be the flow at that point?

Mr. LEA. No. We want more than the natural flow, as a matter of fact.

Mr. TAWNEY. Is not this question as to the natural flow a matter of conclusion and argument? A good deal of time is being taken up in discussing it. When they come to discuss the question of natural flow it will be time to inject these questions into the argument.

Mr. POWELL. It is a question of understanding what the witness means.

Mr. LEA. Let me explain it very briefly. My opinion is that if at this moment you were to take away the bridge that you have spoken of, and the dam, and all the other rubbish which has accumulated on account of them, both there and at any other part of the channel, in the last hundred years or so, and let everything go, the natural flow would pass down that river. There would be another rapids just as on the north side passing down the south side, and the flow would be a certain proportion of the total flow of the river which now goes north and passes down the Rapide Plat on the north side; but in a state of nature there was another rapids on the south side.

Mr. MIGNAULT. In other words, there would be the same condition if all these natural obstructions were swept away; you would come to the river in its state of nature.

Mr. LEA. Absolutely. That was the natural flow. I was asked, first, to investigate what would happen if the natural flow were utilized and were drawn down the Little River, not in a state of nature, because that would not be the way we would develop the power. If we want to develop that flow we would put a power house across the river in the vicinity of the present one, and then we would enlarge the headrace, just as we always do, to such an extent that the water, instead of rushing down as a rapid, would approach the power house at 2 or 3 feet per second. That would mean enlarging the channel of the Little River. In this case they were fortunate enough to have had the larger part of that excavation done by nature—there was a channel there—and also it would be necessary to enlarge the tailrace in order that no head might be lost there.

The extent to which this enlargement would be carried out would be a matter of option with the company developing it. The more excavation they would take out the more slowly the water would

approach the power house and recede from it, and the greater would be the net head for power. On the other hand, the greater the cost would be. So it is a matter for this company to decide as to how much excavation they will do and how much head they will utilize of the total available head. But, anyway, that did not affect the question that was put to me—that is, we are going to divert the original flow into the Little River and discharge it down below as it was before. Now, what effect is that going to have on the main river?

Mr. VAN KENNEN. I wish you would explain a little more fully Plate II and show just what that river flow is.

Mr. LEA. The vertical scale on the left-hand side of the diagram of Plate II shows the figures 10, 20, 30, 40, 50, and 60, and the same figures are shown on the right-hand side. These figures refer to 10,000, 20,000, 30,000, 40,000, etc., second-feet of flow. At the bottom of the diagram, under the words "Discharge of St. Lawrence River," we have a scale reading 190, 200, 210, etc., up to 320.

Mr. KING. That means the total river?

Mr. LEA. Those are in thousands of second-feet, and refer to the total flow of the river.

Mr. MIGNAULT. Including the Little River?

Mr. LEA. Yes; just as if it were measured upstream, where there is only one channel.

Mr. MAGRATH. In a state of nature?

Mr. LEA. Well, at any time.

Mr. MAGRATH. When you have 220,000 second-feet discharged in that river you have how much discharged down that river in a state of nature?

Mr. LEA. 22,500, as shown by this chart.

Mr. MAGRATH. How do you determine that?

Mr. LEA. I determine that by the ordinary methods of figuring the discharge of channels by the cross-section and the height of the water at the entrance.

Mr. MAGRATH. Based upon information that exists in the channel to-day?

Mr. LEA. Based upon information furnished me by Mr. Tucker, which consists of information that can be obtained from the channel to-day: yes.

Mr. MAGRATH. Has not that channel possibly changed since the time of the state of nature through the existing structures that are in the channel?

Mr. LEA. Well, that was allowed for in the cross-sections. When this question was placed before me I paid very little attention to that matter, because I knew it would be difficult to determine, within two or three or four thousand second-feet possibly, what actually flowed there 100 years ago. I saw that if we were governed by the condition that we were not to interfere with navigation, and that if by certain remedial works we could easily comply with that and take more than the natural flow we might as well have it, and the sequel will show that that was the case.

Mr. MIGNAULT. You say that this diagram was computed by taking certain cross-sections of the Little River. Are you putting these cross-sections into evidence so we can follow you?

Mr. LEA. I think so.

Mr. VAN KENNEN. We propose to do that. That was the resident engineer's work and, unfortunately, he is sick. We will put that in subsequently or bring it before the commission in whatever form they want us to.

Mr. LEA. I think it has already been in the hands of the Government engineers for weeks.

Mr. STEWART. I have had all those cross-sections.

Mr. LEA. Now, we are at the point where conditions were supposed to have reverted to a state of nature. We were going to remove the present obstructions. The natural effect at the present time, if we were to do that, would be to furnish two channels for the water flowing down the river at that point instead of one and, naturally, less would pass down the north channel than passes down there at present. I may say that as a general thing when the flow of the St. Lawrence in this vicinity varies you will find the level drops or rises about 1 foot for each 17,000 or 18,000 second-feet of flow. That is, as the river rises and falls throughout the year you will find that for a change in quantity flowing down there now of 17,000 or 18,000 second-feet the river will drop or rise 1 foot. And that is nearly true at all stages of the river. The St. Lawrence River is a river whose extreme fluctuation in level is only about 7 or 8 feet. During navigation season it for 60 years has been confined to about 6 feet. If we do anything as proposed the effect can only be very slight. If we were to divert at the point of entrance of the Little River the 17,500 second-feet and turn it over into another watershed altogether, if we could, over to the Hudson, we would drop the water, in that vicinity only a foot, not only at the upper lock but at the lower lock and all the way down the Rapide Plat; and that is the district we are all concerned in, because that is the region where we might interfere with navigation. I said that that would happen if we diverted this water out into another watershed altogether, but, as a matter of fact, we return it to the main river down below Ogden Island, so that the levels there will not be changed any more than if we were not operating at all. If we took the water out at the upper end altogether it would affect the river below all the way down, but we put it in again at the lower end of Ogden Island.

Mr. GLENN. It affects it between those two points?

Mr. LEA. It does, that is quite true, and there is where we look for the trouble and where the necessary remedial works are to be placed, or at least where their effects are to be felt.

Mr. MIRNAULT. What is the effect? Is it 1 foot for every 17,500 feet?

Mr. LEA. Roughly speaking, yes. That is a figure that if anybody can keep in his mind it will be about right. It does change at higher stages of the river. I have taken that into account when I have had to figure backwater, etc.

Mr. MIGNAULT. If you took 35,000 second-feet out of the St. Lawrence in the South Channel, you would lower the level at the head of Ogden Island by 2 feet?

Mr. LEA. Yes, sir.

Mr. MIGNAULT. Just tell me, for my own information, how much water flows from the main river into the Little River at the head of Ogden Island.

Mr. LEA. That is a mere matter of accident; sometimes there are 4,000 or 5,000 flowing and sometimes 3,000. Most of it is leakage through the old dam, which is a flimsy structure.

Mr. MIGNAULT. Have you any data showing the actual inflow, if I may use that term, into the Little River now?

Mr. LEA. Yes, sir; two or three separate measurements. Reverting to Plate II, it will be seen that the inflow, whatever it is, down the Little River depends on the stage of the main river, and the higher it is the greater percentage goes down. Therefore, the effect on the levels in the river will also vary with the stage of the river. I limited the principal part of my investigations to the stages of the river when we could possibly interfere with navigation, because when the water is at average height nothing we would do could affect navigation unless it changed currents, but we would not affect navigation by diminishing the depth because all that is needed is a clear 14 feet over the lock spills to get the boats through, and if we have say 16 feet we have lots to spare. Then, while that diversion might affect the river it would not affect navigation at Lock 24.

Mr. MIGNAULT. There is no effect, I understand, in connection with the boats using the main channel and not the Morrisburg Canal?

Mr. LEA. Yes; that is in the district affected; between the upper end of Ogden Island down the rapids to Lock 23, because while we return the water at the lower end of Ogden Island, and do not affect the level there, we do affect it at the upper end, and, to a certain extent, down through the rapids; that is, if we put in no remedial works.

Mr. MIGNAULT. Is the channel in the main river deep enough so that navigation can be carried on irrespective of any diversion into the Little River?

Mr. LEA. No, sir. That was one of the principal points that we had to take care of; even more so than the entrance to Lock 24. The point I had gotten to was the effect on the river, due to our diverting the natural flow or any other flow into the Little River channel, which would depend upon the amount of flow and would vary with the stage of the main river. The effect would be to lower the level of the water at the point of diversion.

Now, I want to refer to the embankment, which is shown on Plate I, connecting Ogden Island with Canada Island. The water flowing down the north channel when it reaches the foot of Ogden Island divides; a part of it flowing north of Canada Island next to the Canadian shore, and a part flowing in a southerly direction by the foot of Ogden Island. The proportions which flow in these channels are as follows: In the channel last mentioned from 30 to 40 per cent of the total flow passes according to the stage of the river; the balance of 70 to 60 per cent flowing between Canada Island and the north shore.

Mr. POWELL. That is quite a wide leeway. Can you not get nearer than that?

Mr. LEA. Yes; I can tell you it exactly at any stage of the river, but what I want to say is that it varies from 30 to 40 per cent according to the stage of the river, and that is from the minimum to the maximum stage observed in 60 years.

Mr. MAGRATH. The greater volume going north of Canada Island?

Mr. LEA. Yes; north of Canada Island. Of the part which flows south, the greater portion flows between Ogden Island and Clark Island directly over to the mouth of the Little River, and the smaller portion flows between Clark Island and Canada Island.

Mr. POWELL. What are the percentages there?

Mr. LEA. I do not know exactly. It is, I think, about the same as in the first case. It is a matter of very little importance, because the embankment blocks the whole channel between Canada and Ogden Islands. The reason more flows down the northerly channel is because the channel is very much deeper there. Between Ogden and Canada Islands there is a natural ridge of bowlders, and the depth of water on that ridge varies with the stage of the river, but in ordinary stages a boat drawing 14 feet or less will ground upon it; and this strong current, 30 or 40 per cent of the total flow of the river, crossing there tends to create such a strong side draft that it is with great difficulty they keep clear of it. They are required to struggle against that current and to point the boats north in the river there—that is, toward the Canadian shore—until they get rid of its influence, and then they have to make a sharp turn toward the east and get back into the line of the channel again.

One of the effects of this embankment will be to correct that. It helps navigation out to that extent. Another effect which is to our advantage is that, having cut off such a quantity as that from flowing across into the part of the river at the mouth of the Little River, we decrease the quantity of water flowing there and reduce the level in our tailrace 6 inches or so, and that adds to our head. That is, the effect is the same as deepening our tailrace.

Mr. POWELL. Is that statement correct, that that would equal about 1,500 horsepower?

Mr. LEA. It would depend upon what the total developed would be. An extra 6 inches would be something like that.

Mr. MIGNAULT. You are not proposing to excavate the tailrace?

Mr. LEA. We are for a short distance, until we get into the deep channel.

Mr. MIGNAULT. I understood the proposition was that by diverting this current it would lower several of the heads?

Mr. LEA. No; that was only an incident. This embankment was not proposed in the original proposition at all. It was my proposal. They have to excavate from the lower part of the power house until they get down into deeper water.

Mr. POWELL. About the accretion to the power on an 11-foot head; what is the increase of power presumably going to be there, or the results, rather—80,000?

Mr. LEA. The total development?

Mr. POWELL. Yes.

Mr. LEA. No; it will not be over 30,000. That naturally depends upon what happens in the future as to what power is worth, etc.

Mr. MAGRATH. You think that embankment is going to improve navigation along the north side of the channel?

Mr. LEA. Along the lines I have already described by changing the current.

Mr. MAGRATH. As 70 per cent of the water to-day goes north of Canada Island, and as your proposal is one in which you do not

intend to withdraw water from the north channel, you are going, then, to throw the entire 100 per cent north of Canada Island, where before it only carried 70 per cent. Is that going to affect navigation?

Mr. LEA. Yes; we are going to send more water through there than before; but remember that we are going to take 30,000 second-feet into the Little River which is not there now. We are going to take away 30,000 through the main river and put it through the Little River channel.

Mr. MAGRATH. Then, if you are going to have less water going over the rapids, how is that going to affect navigation?

Mr. LEA. I am coming to that, sir.

Mr. GLENN. If you take this 30,000 feet of water away from the intake and then put in these remedial works, in your opinion how would it leave it as compared as to what it is to-day?

Mr. LEA. Better.

Mr. GLENN. In what respect would it be better?

Mr. LEA. Well, that is a long story.

Mr. GARDNER. Do you propose to divert all of the water that now passes between Canada Island and Ogden Island?

Mr. LEA. Yes; the whole of it. That is to say, unless we can get along with less. The effect of placing the embankment between Ogden Island and Canada Island will be, as has just been stated, to divert more water to the north of Canada Island and so increase the current there and also to choke the current at that point and raise the level of the water in the river, creating backwater at the foot of Ogden Island.

Mr. GARDNER. It would naturally increase the current down below there?

Mr. LEA. Yes. Now, coming to the question of the flow north of Canada Island. The effect will be to increase it at the lower stages of the river, in which navigation is concerned, from about a little over 6 to 9 feet per second, and at higher water from probably 8 to 12 feet per second. That would be somewhere about two-thirds of these figures in miles per hour. That is, as far as I can see, we will create a speed there of about 8 miles an hour where now there is probably a speed of only 6.

Mr. KING. Are you referring now to a high or low stage?

Mr. LEA. I am referring to the high stages. At the low stage in the navigation season we will probably increase the average velocity there from about 6½ to a little over 8½ feet per second, and about two-thirds of these figures in miles per hour. Those are the figures as nearly as I have them now, and I believe them to be very nearly correct.

Mr. GARDNER. What would be the practical effect on navigation?

Mr. LEA. The practical effect to a navigator in getting around the part of the river from the foot of Ogden Island to the east of Canada Island will be, in my opinion, a very decided improvement, because instead of approaching the channel between Ogden and Canada Islands, pointing at an angle across the direction of flow until he loses the grip of the side draft and then having to make a short turn, the flow will be directly down the river and he will approach this channel head-on in a direction parallel to the general direction of the river channel. The velocity will, of course, be a little detrimental

possibly. I do not know that it will be any real detriment, but when he makes his turn below there I suppose the faster the water goes the more difficult that will be. But the turns are not anything like those he has already passed and will be required to pass if he goes up and down the whole river.

Mr. MIGNAULT. What do you consider the effect will be of this increased velocity on the lower stretches of the river which are not shown on Plate I?

Mr. LEA. They would not go beyond that place, because they spread out immediately when they pass Canada Island.

Mr. POWELL. As I make it out, Mr. Lea, the resultant of the whole business is, after you add the increase owing to your dike and make your subtraction for the diversion, there is an increase of about 10 per cent of the height of the main channel down below?

Mr. LEA. Do you mean up above?

Mr. POWELL. No; down below.

Mr. LEA. No; the same quantity of water will be flowing down below.

Mr. POWELL. But an increase in height, I mean. Your dike is going to raise the height.

Mr. LEA. At what point?

Mr. POWELL. Between Canada Island and the mainland.

Mr. LEA. The dike is going to increase it considerably.

Mr. POWELL. Then, there is a counterbalancing consideration—that is, a diversion. When you add the accretion and take away the reduction, the resultant is about a 10 per cent increase in the height of the water.

Mr. LEA. That can not be considered so easily as that. I think it is a matter of a foot and a half depth.

Mr. POWELL. That would be about 10 per cent?

Mr. LEA. I do not know what the depth is there. It may be perhaps 25 or 30 feet.

Mr. KING. It is not in evidence yet.

Mr. LEA. I am merely answering Mr. Powell's question.

Mr. KEEFER. I think we had better take that up in sequence with the engineers who can furnish that.

Mr. LEA. The average depth down there is what, Mr. Stewart? Do you know? If we were to take soundings up there and average them, I think the average would be something like 25 feet, and my impression is that we would at that point, by the effect of that embankment, raise it possibly a foot and a half.

Mr. STEWART. The hydraulic radius at gauge 14 is 20 feet.

Mr. LEA. At low water?

Mr. STEWART. At low water.

Mr. LEA. The embankment besides having this effect on navigation of straightening the current, has also the effect of raising the level of the water at the foot of Ogden Island, just at the point where this embankment is constructed and that rise has the effect of creating backwater which carries upstream a sufficient distance to increase the depth in the shallow portion of the rapids to such a point as to more than correct the decrease incident to taking away the total 30,000 second-feet through the Little River.

Mr. MIGNAULT. How far does that backwater extend?

Mr. LEA. That backwater, so far as it increases the present depth of the water will extend, I should think, at least a mile above this shallow place, and will also help to correct the diversion drop in level which takes place at the entrance to the Little River, and at Lock 24, but not altogether. But the net drop will be not such as will interfere with the boats passing down the canal. Lock 24 is not the governing lock in the river, and we can reduce the level at Lock 24 and still have more depth over the sill than we would have at Lock 15 or Lock 21. As I said, the effect of this rock fill dam is not sufficient to fully compensate for the drop at Lock 24 and at the intake. I do not claim that it is. It corrects a good deal of it and will leave sufficient water there for navigation. But if for any reason we want to fully compensate we can do so by the fill referred to at point E.

Mr. KEEFER. That is the submerged weir?

Mr. LEA. It is not a submerged weir; it is a dump of rock in the river. You can call it a submerged weir, but that is a dignity I did not think of conferring upon it. It is a matter of shallowing the river at that point by means of which we can raise the water so as to fully compensate, along with this rock fill dam, for the total drop due to the diversion of the water we pass through the Little River channel.

Mr. MIGNAULT. What are the dimensions of that weir?

Mr. LEA. We ought to fill it up and down stream at least 500 feet, I should think, and we ought to leave there about 22 feet of water at ordinary stages.

Mr. WHITE. In the event of a necessary shutdown of the plant, would the water that normally flows through the Little River be turned through the north channel and go to augment the 8-mile velocity?

Mr. LEA. It is not necessary, because, as I understand, the only reason for a complete shutdown of that plant would be a breakdown in the transmission line.

Mr. WHITE. Where would the water go?

Mr. LEA. We can deal with it the same as we did in the Winnipeg River plant. That is, we could connect all the machines up to water rheostats.

Mr. WHITE. Is there the contingency that it may have to go down the north channel?

Mr. LEA. No. We have considered that, and we will not let it go down the north channel. Before that could happen we could have the opening through the wheels that we had when running. Even if the wheels were allowed to run away, they could only get up to a small percentage above the normal rates, I understand.

Mr. WHITE. I might just ask another question that I have had in mind with respect to the excavation in the Little River channel. What percentage of that excavation is in solid rock?

Mr. LEA. I do not know. I understand that the solid rock percentage is largely at the site of the power house itself, where, fortunately, it ought to be, and Mr. Connolly informs me that he does not think that more than 10 per cent of the total quantity that he mentioned would be in solid rock.

Mr. WHITE. Of course, it would depend upon where it is taken out.

Mr. LEA. My impression is that there would not be any solid rock in the upper channel at all, because there is no appearance of solid rock. There is only the general surface formation of the country, bowlders, and clay; but down at the power house you can see the solid rock itself; it is exposed.

Mr. WHITE. What was there in the way of physical characteristics in the bed of the channel that led you to derive your opinion as to what was the natural bed 100 years ago?

Mr. LEA. I did not do that.

Mr. VAN KENNEN. We will have to introduce that later with our other engineers.

Mr. WHITE. That will be information that was supplied by Mr. Tucker?

Mr. VAN KENNEN. Yes, sir.

Mr. LEA. A cursory examination of the river at the mouth shows that there have been growths of reeds, etc., for the hundred years, and there is a foot or so of muck, etc., which did not exist when the current was passing there.

Mr. VAN KENNEN. And which would not exist there if the dam were taken out?

Mr. LEA. No; I think that they would not exist there very long.

Mr. VAN KENNEN. The washing, Mr. White, would take all that silt out.

Mr. KEEFER. I suppose this would not be a bad place to talk about the bowlders that come down. Do you usually have them coming into still water?

Mr. LEA. I have expressed this opinion, that my calculations show that the rock fill dam at the extension of Ogden Island will correct any adverse effects which might be caused by the diversion of water through the Little River, in connection with the possible dumping of rock below Lock 24.

Mr. STEWART. How much leakage do you think you will get through that dam? Can you make it pretty tight?

Mr. LEA. We can make it pretty tight; yes. There is only about 3 feet head on it.

Mr. VAN KENNEN. Did you make calculations which show the amount of supplementary water required to maintain the 30,000 cubic feet which you asked for in your application? I mean over and above what we say we are entitled to as a matter of right—namely, the naturaly flow of the stream?

Mr. LEA. Yes.

Mr. VAN KENNEN. I would like to introduce this Plate A in evidence. It is a table showing the amount of the supplementary water in order to maintain the 30,000 cubic feet per second flow in the Little River.

(The plate referred to was marked "Applicant's Exhibit A–22.")

Mr. LEA. The only time we do need supplementary water is when the natural flow of the Little River falls below 30,000 feet. The natural flow of the Little River in high stages of the river goes over 30,000, and there is more than enough coming to us. Sometimes it drops to 25,000, and in that case we need 5,000 supplementary. In extreme conditions, according to that diagram 2, we might need as much as 15,000; but that is the maximum, and that is only one month

in the whole period of about 50 years, or since 1860. I think I can perhaps illustrate it better from this diagram, which has just been filed. This diagram shows as follows: We require 15,000 second-feet of supplementary water, according to that diagram, about one month in 58 years, or in the whole period since January, 1860. We require 12,000 second-feet for about 3 per cent of the time. I am speaking now of the navigation season only.

Mr. VAN KENNEN. What I want to find is the quantity of supplementary water that you would have to have over and above the natural flow at the different stages of the river.

Mr. POWELL. You had better prepare and submit it to our adjourned meeting.

Mr. VAN KENNEN. We have just had a moment's conversation here. Inasmuch as we shall have to have our engineer who is not here testify, and inasmuch as you are going to probably adjourn the hearing to some future time, I was wondering if we could not suspend at this time, because I certainly can not have Mr. Lea away when they are putting in engineering testimony on the other side. I did not know but what it might be the proper time now to talk with the commission. I take it that the commission would like to go and see the place. That being so, we would probably have to have a meeting, unless you went individually.

Mr. POWELL. Most of us feel we ought to go.

Mr. KING. May I add to what Mr. Van Kennen says? Unfortunately it was quite impossible for me to bring down what you ought to have, the best expert evidence as to the navigation of the river, because I was only notified Thursday or Friday that the session would take place down here. I had the marine superintendent principally engaged on the river come with me. I could not bring him down here. I do not want the commission to take my statements, and I am in ignorance about a great many points. I would like an adjournment so that some such gentleman would be with me when such points are discussed.

Mr. LEA. I am informed, Mr. King, that no 14-foot boats have ever gone upstream. Is that true?

Mr. KING. I am not in a position to contradict or support a statement of that kind.

Mr. LEA. I should have said before that this increase of the current north of Canada Island will make the current less than exists at the present time for a distance of over a mile in the middle of the rapids. So that any boat that can go up the rapids now will have a less current to face with the embankment in place than it has at present.

Mr. KING. Not at the high stages. You intimated that there would be an increase.

Mr. LEA. I was not referring then to anything west of Canada Island. But there is a stretch of the rapids—it is something over a mile in length—in which we have measured the current with many floats, and the present current there is greater than will be created north of Canada Island when the rock-fill dam is put in place, and, therefore, I say—subject to correction by a practical navigator—that a steamer going up the rapids now has greater difficulty and has

to face a swifter current than she will have to face north of Canada Island after the rock-fill dam is put in place.

Mr. GARDNER. Gentlemen, are you all in agreement that you would like to suspend at this time the consideration of this case to some adjourned meeting?

Mr. LEA. I think I will be through the greater part of what I have to say in a few minutes. If the cross-examination is not too long and the other evidence is not too long, I may still be able to get away by 4 o'clock.

Mr. POWELL. But they might want their experts to suggest questions to them for your cross-examination.

Mr. KING. I do not want to ask Mr. Lea to finish up and nail his colors to the mast now and then come along two or three weeks later and begin his cross-examination; but I should have the benefit of some expert advice while we are going on with the examination.

Mr. KEEFER. It is immaterial, so far as Canada is concerned, whether we go on now or later; but it appears that there is not the data carefully in shape to rapidly give it and then to be cross-examined upon it. There are points in which Mr. Stewart and Mr. Lea may differ. They both ought to hear each other's testimony. I think it would be very advisable, in the interests of getting whatever is right here, that we do not drive this thing through now.

Mr. VAN. KENNEN. I am ready to say, if it meets the approval of the commission, to adjourn this matter to some time when we can go on with it, when I can have my other engineer present with Mr. Lea.

Mr. TAWNEY. Would you be ready to go on with it in about two weeks from now?

Mr. VAN KENNEN. When is your next meeting?

Mr. TAWNEY. The 1st day of October at Ottawa will be the next annual meeting.

Mr. VAN KENNEN. That is satisfactory to me. We would be very glad to go over to Canada.

Mr. MIGNAULT. Mr. Van Kennen, what I would like to have in the record is some description of the proposed work. We have nothing on that point.

Mr. VAN KENNEN. That I expect to put in. Mr. Lea, will you describe those blue prints, so that they can be put in the record?

(The two blue prints were marked, respectively, "Applicant's Exhibit A–23" and "Applicant's Exhibit A–24.")

Mr. LEA. Applicant's Exhibit A–23 is a cross-section, in a more or less diagrammatic form but generally to a reasonable scale, of the proposed power house, showing the machinery in place and the channels of approach and departure of the water. Applicant's Exhibit A–24 is a plan of a section of the power house sufficient to show two or three bays.

Mr. GARDNER. Then, if there is no objection, this case stands adjourned until the October meeting of the commission in Ottawa, the first Tuesday in October.

(The commission thereupon stood adjourned.)

INTERNATIONAL JOINT COMMISSION,
Ottawa, Tuesday, October 1, 1918.

Present: Canada, C. A. Magrath, chairman, H. A. Powell, K. C., P. B. Mignault, K. C., Lawrence J. Burpee, secretary. United States, Obadiah Gardner, chairman, James A. Tawney, Whitehead Kluttz, secretary.

APPEARANCES.

For the applicant: Thomas Spratt and George E. Van Kennen, of Ogdensburg, attorneys for the New York & Ontario Power Co.

For the Government of the United States: Mr. Geo. W. Koonce.

For the Dominion Government: Mr. Frank H. Keefer, K. C.

For the Dominion Marine Association: Mr. Francis King.

For the State of New York: Mr. Marshall McLean, deputy attorney general.

For the Canadian Conservation Commission: Mr. James White, deputy minister.

The different parties were represented by their engineers, as follows:

Mr. W. J. Stewart, hydrographer for the Dominion Government; Mr. John E. Churchill, United States Government, district engineer; Mr. A. H. Perkins, division engineer, for the State of New York; Mr. B. B. Tucker, engineer of the applicant company; Mr. H. G. Acres, engineer for the Ontario Hydroelectric Commission; Mr. R. S. Lea, consulting engineer of the New York & Ontario Power Co.; and Mr. Arthur V. White, for the Dominion Conservation Commission.

At the sitting of the commission, Mr. Magrath presiding, all the members except Mr. Glenn being present:

Mr. TAWNEY. I wish to inquire from the secretaries if all the parties who have heretofore appeared in this proceeding have been notified of the time and place of this meeting?

Mr. BURPEE (secretary). All on the Canadian side have been notified.

Mr. KLUTTZ (secretary). All on the United States side have been notified.

Mr. John C. Crapser was called, and was not in attendance nor represented.

Mr. POWELL. This is a judicial matter, under Article VIII of the treaty, that we are at now. It is not an inquisitorial function we are performing; it is judicial. The commission is not complete; Gov. Glenn is not here. I call that to your attention, so that if we go ahead, the parties must take the responsibility of that.

Mr. TAWNEY. Under the rules of the commission, less than the full number of the commission may take testimony on an application.

Mr. POWELL. There is that provision about the taking of testimony.

Mr. VAN KENNEN. I suppose it might be cured if the whole commission acted subsequently upon the application.

Mr. MAGRATH. There is a letter from Gov. Glenn, dated the 28th of September, which has been handed to me by the secretary. It is unsigned, but it is evidently from him. It refers to his illness, regrets that he is not able to be present, and asks that the testimony

may be sent to him so that he may be able to make up his mind as to the application.

Mr. KLUTTZ. There is a signed letter to the United States section of the commission from Gov. Glenn, of which that letter which the chairman of the Canadian section has is a copy.

Mr. TAWNEY. Mr. Van Kennen, it has been suggested that as considerable time has elapsed since the meeting at Atlantic City, when you commenced the introduction of your testimony, that it might be well to preface your testimony this morning by a brief summary of what evidence has been offered, and the particular points in the case which the evidence is intended to meet and cover, so as to give the commission an idea of the testimony that has already been in. I do not think any of us has had the time since the meeting at Atlantic City to go through that record fully and carefully.

Mr. VAN KENNEN. Will that record of the testimony be printed before the application is finally passed upon?

Mr. TAWNEY. Yes. But I thought it might be well, inasmuch as considerable time has elapsed since the meeting at Atlantic City, to connect up that meeting with this one by a statement from you as to the points covered by the testimony you have previously offered.

Mr. VAN KENNEN. The application of the New York & Ontario Power Co. first came before this commission upon a petition of the company for a permit, first to reconstruct and repair its present dam at Waddington, St. Lawrence County, N. Y., on what is known as the Little River, which is part of the St. Lawrence River, between Ogden Island, on the south shore, and a place in the State of New York known as Waddington.

We also ask the alternative permission to construct a new dam at a point a few hundred feet below the old dam.

We also ask in that application the right to the natural flow of the Little River for power purposes at that point.

We introduced testimony with respect to the natural flow of the Little River, and I expect to offer further testimony with regard to that. At the hearing at Atlantic City the resident engineer of the New York & Ontario Power Co. was ill and unable to be there, and I hope to supply some figures now that will support and explain the testimony that was offered at that time. I shall also offer some further testimony upon that point by Mr. Lea.

In addition to that we have asked permission to utilize the natural flow of the stream, whatever that may be found to be by this commission—I think it is disclosed in our application, as we claim it—to the highest degree of efficiency. And therefore we have asked permission to excavate certain artificial obstructions in the Little River consisting, among other things, of old dams and piers and other obstructions that have been put in there, silt deposits, which have been deposited in the bed by reason of the use of this stream, and such other excavation as will enable us to use the natural flow to the highest degree of efficiency only.

Now, that, I would say from my point of view, is the primary purpose of this application.

Mr. MIGNAULT. Let me ask you: Is your application in the same status as it was at Atlantic City? In other words, have you done anything in the meantime to obtain the approval of the Dominion of

Canada to the construction of the works which would be constructed in Canadian territory?

Mr. VAN KENNEN. I do not think we have done any more, except to consult with the engineers and the other parties in interest, and explain our project as far as we could. But no official action, so far as I know, has taken place on the part of any of the departmental branches of the Government.

Mr. MIGNAULT. You will appreciate that no obstruction can be put in the bed of the river, north of the boundary line, without the approval of the Dominion of Canada.

Mr. VAN KENNEN. I should understand that. As I understand the situation, that is probably true. I take it, however, that this commission has certain jurisdiction with respect to the approval of the plans. I am not clear upon the point as to whether that approval of this commission would be sufficient or not. Of course, we can only do one thing at a time, and we want the approval of this commission, if we can get it.

Mr. MIGNAULT. I want you to understand that.

Mr. VAN KENNEN. I think the same thing is true with reference to the State of New York on the south shore.

Mr. MIGNAULT. The situation is not exactly the same, as I understand it. On the south side you would have to get permission from the War Department.

Mr. VAN KENNEN. I understand.

Mr. MIGNAULT. And on the north side you would have to get the approval or consent of the Dominion Government.

Mr. VAN KENNEN. You are speaking now of the north side of the international boundary line?

Mr. MIGNAULT. Of course.

Mr. VAN KENNEN. Of course, we have introduced some testimony with respect to our rights in the Little River. Now, we propose, as part of our project, which I have not yet come to in my statement, to build an embankment from Ogden Island to Canada Island.

Mr. MIGNAULT. You stated that at the last meeting. That would require the permission of the Dominion Government.

Mr. VAN KENNEN. I think that is perhaps likely unless the authority of this commission would be sufficient to cover it.

Mr. MIGNAULT. It is not only very likely but it is absolutely essential that you obtain the approval of the Dominion of Canada for the construction of this embankment between Ogden Island and Canada Island, and also for the construction of the proposed pier at point E on the plan.

Mr. VAN KENNEN. I accept the decision of the commission in regard to that, but I was not sure on this point as a matter of fact—I do not know but what this commission would have authority to grant that privilege inasmuch as it relates to controlling works. I am entirely willing to accept any requirements necessary, but we can only deal with one thing at a time.

Mr. MIGNAULT. My object in putting you the question was merely for my own information as to whether you had done anything since the last meeting to obtain the approval of the Dominion of Canada.

Mr. VAN KENNEN. I have not. I spoke to the Secretary of War. I want to state, as I understand the situation, that this can not be done

without the approval of the Secretary of War, and the Secretary of War suggested this procedure, to have this commission pass upon it first, and then when the report of this commission comes in and is presented to the Secretary of War, the Secretary of War can take action upon it.

Mr. MIGNAULT. Any action that the commission would take on an application of this kind is not in the form of a report at all; it is a final judgment.

Mr. KEEFER. It seems to me, Mr. Mignault, that your suggestion to Mr. Van Kennen is entirely apropros. I was going to bring up the same point in regard to Canada. I do not make the suggestion in any way as obstructing the application, but rather as a help. We have the cart before the horse in this application. As to Canada, the first procedure should be to ask for the approval of the minister of public works. The first thing to be done is to submit the plans to the department of public works which will pass upon them and say whether or not they are injurious. If there is approval of these plans in the department of public works, then the applicants can come here and ask for the approval of this commission. It is the same thing on the other side of the line. To-day we are going on with this case and the commission may make an order and find that subsequently it will be reversed.

Mr. VAN KENNEN. The procedure on our side of the line is the reverse of what Mr. Keefer understands to be the procedure on this side of the line. As I understand it the Secretary of War, who has been consulted, has referred the applicants here.

Mr. KEEFER. I would make another suggestion for the consideration of Mr. Van Kennen, and that is that it seems advisable, before we go into the engineering testimony, now that he has his own engineer here, that the engineer of the applicants, the engineer of the United States, the engineer of the State of New York, and the engineer of Canada should confer together. Perhaps they can see eye to eye on this matter and if they do it will simplify the work before this commission. If they do not agree, we will know exactly what the differences are, and we could eliminate a lot of unnecessary testimony and controversy. As a large portion of this is certainly an engineering question, I would ask that the engineers should get together, to see if they can not agree amongst themselves, and meanwhile we could go on with the legal branch of the case, if it is considered advisable to do so. I think more headway would be made if this suggestion were adopted.

Mr. TAWNEY. It occurs to me that the question that is now being considered is a question that should properly come up for consideration at the conclusion of the testimony which the applicant is here to present to the commission, as to whether his application should be approved. We are now in the midst of this hearing. We have had one hearing at Atlantic City, and I think the better way and the most orderly way would be to allow the applicant to proceed with offering his testimony. And then, at the conclusion of the investigation, it can be considered whether or not the action of the two Governments, within whose jurisdiction the obstructions are to be constructed, would precede or follow the action of this commission. It would be more proper, I think, to consider that question then. But

to break into the hearing of the case now, inasmuch as we have already started, would, I think, lead to more or less confusion. My only reason for suggesting that Mr. Van Kennen should make a preliminary statement was to have him simply summarize the testimony that was offered at Atlantic City, in order to connect it up with this hearing to-day. In other words, I wanted him to give us a continuous story. As to whether or not the authority of the Government within whose jurisdiction the obstruction is to be made shall precede or follow the action of this commission that is a question which we could consider after all the testimony is in. I would also suggest that if a conference between the engineers of the applicant and the engineers of the Governments is contemplated, that conference could perhaps be more intelligently carried on after the testimony has been offered than before.

Mr. VAN KENNEN. I shall be glad to have such a conference at the proper time, and I am thankful for the suggestion.

Mr. TAWNEY. It is only in the interest of orderly procedure that I made the suggestion I did, so as to connect up the hearing at Atlantic City with the hearing we are entering upon now.

Mr. VAN KENNEN. I think we should go on with the testimony.

Mr. KOONCE. Many questions which will come up on this application are engineering questions, and I agree with the suggestion of Mr. Keefer that it would be well if the engineers of the Dominion, of the United States, of New York, of the applicants, and of Ontario should get together and discuss between themselves the engineering features of this proposition. That would relieve the commission of a great deal of trouble and would tend to shorten the hearing. That procedure was adopted in the case of the dam across the St. Marys River at Sault Ste. Marie, and the engineers met together and had a discussion and came to a unanimous decision as to the effect of the dam. I think that would be a good thing to do in this case.

Mr. MIGNAULT. That might be a little premature at this juncture.

Mr. KOONCE. Perhaps it is. It might be well for me to state for the United States that this application which the company has put before you was put before you with the consent of the United States Government. The company made application to the Secretary of War for approval of this proposition, and owing to the fact that we have no settled policy in regard to water-power development in the United States at this time, and that there would be delay in Congress covering the whole situation in passing a bill which is now before it—in fact, I might say that I had something to do with that bill myself, if I may not be accused of lack of modesty—owing to that fact the department did not consider that it was in a position to give approval to any new power-production scheme. But there was no objection to referring it to your commission to pass upon the international aspect and those matters which you would naturally have to pass on under the treaty. And so it was sent from the War Department to the Secretary of State with a request that it be referred to your commission. Of course, it is in your discretion whether you will consider it in advance of the consent of the two Governments or not. So far as the United States is concerned we would be glad to have you consider it and to pass upon the question. I imagine the Dominion of Canada would also have no objection to your passing upon the application, it being

well understood, however, that your approval will not carry with it any authority to put anything in the river until the consent of the United States Government has been obtained on that side and the consent of the Dominion of Canada on the other side. I think everybody understands that. And as to the actual encroachment on the territory on either side, by any authority granted by your commission, they would want the consent of the two Governments for that.

Mr. POWELL. The commission is in this position, that it has already let the applicants go ahead with their case.

Mr. KOONCE. You know the position you took in the case of the St. Croix Dam. There was a dam there that was built without any authority from either country. It came before the commission and the commission gave approval to this dam on condition that the necessary consent should be obtained from the two Governments. And, subsequent to your approval I drafted the bill myself at the request of Senator Johnson, from Maine, and it was afterwards passed by Congress, legalizing that dam, so far as the United States Government was concerned. That was all done subsequent to your consideration and approval of the matter.

Mr. TAWNEY. The approval of the commission was conditional upon their obtaining that authority.

Mr. KOONCE. The order of the commission had no effect whatever until that authority was obtained.

Mr. MIGNAULT. The cases are not entirely parallel, because in the St. Croix case the obstruction had already been built. In that case there could be no question as to what the obstruction would be, whereas here the War Department or the Dominion of Canada might require a modification of the plans, and if we give our approval in advance it would not cover the modification and the whole thing would have to be brought before us again. I just call your attention to that.

Mr. TAWNEY. I think we can hear the evidence and consider that point afterwards.

Mr. KOONCE. This case, of course, differs from the St. Croix case, but it seems to me that the applicants in the case are in a better position. The St. Croix structure was built in absolute violation of the law of both countries, while in this case nothing has been done before seeking your approval.

Mr. POWELL. We have let you go ahead already and, if I am not guilty of a bull, I would say that if we were going to stop you we should have stopped you before you began. Having gone so far, the only logical position is for us to hear you further. But I may say in support of what Mr. Mignault has said that there is a solemn judgment of the commission already to the effect that these should be conditions precedent to our consideration.

Mr. TAWNEY. You are mistaken there; where authority has been granted it says the plans can be approved.

Mr. POWELL. That is what I say. The approval of the Government concerned is the condition precedent to our going ahead. I dissented from that opinion at the time and we have acted on the other view many times since. I think the only thing to do now is to let the applicants go ahead.

Mr. VAN KENNEN. I shall conform to any mode of procedure that may be directed. I may say that Judge Koonce has stated the position properly, from the point of view of the American side.

Now, in connection with this plan we have submitted evidence with regard to what we claim to be, as I say, the natural flow of that stream, which we claim that we are entitled to as a matter of right.

In addition to this, we have asked the privilege of constructing an embankment from the so-called Ogden Island to Canada Island.

Now, as I understand that embankment, it crosses the international border line and, of course, a part of it would be in Canada and a part of it in the United States.

Mr. POWELL. About half in each.

Mr. VAN KENNEN. With respect to that part in the United States, it may be necessary to have the consent of the State of New York, because as to that particular part of the river I take it that the State of New York owns the bed of the stream.

The purpose of that, and the evidence which was offered for the purpose of sustaining the position which we have taken is twofold. One is, the benefit to the applicants, the New York & Ontario Power Co., and the other is that we claim it is a benefit to navigation, upon which we have also introduced some testimony, and we expect to introduce other testimony with regard to that. The benefit to our project would be that it would lower the tailrace, and if I recall the testimony it would add about 1,000 horsepower to the power capacity of our plant.

Now, so far as the benefits to navigation are concerned, we claim that that point is one of the most dangerous points for navigation in the St. Lawrence River, within that stretch. There is at that point a very strong side draft, and with the large body of water flowing between Ogden Island and Canada Island, very frequently when the tows are coming down the north channel of the river, in their effort to bear away from this side draft, the vessels come to grief there, and that place has been termed the graveyard of many of the boats navigating that stream. We eliminate that danger by this project.

In addition to that, by the elimination of that, we have increased the water above. In other words, what we shall call the backwater effect of this embankment we claim will be a benefit to navigation. That section of the stream happens to be such that at a point above this there is what is known to the navigators as the Hogs Back, and the effect will, we claim, be to put more water over that and also relieve the fall that is there at the present time, which will, we claim be a benefit to navigation.

In addition to that, we have asked the right to put in a submerged weir at the head of the north channel opposite Lock 24 of the channel, all of which is to be done, as we understand it, with the approval of the Dominion Government and their engineers, as to the form and height of our plan. Our evidence has shown that there is a clear 22 feet of water over this so-called submerged weir, at the lowest water period, which will be a much greater amount of water at that point than any of the present boats need, because the canal is 14 feet.

In addition to that, the weir has a further effect, beneficial as we claim, to both navigation and water power. The proof has not yet been furnished, but we expect to furnish proof in reference to the

water on the sill of Lock 24, where the measure is at present 16 feet and a fraction.

Mr. KING. Are you not referring to Cardinal?

Mr. VAN KENNEN. No, sir.

Mr. KING. You are referring to the head of the Morrisburg Canal.

Mr. VAN KENNEN. Yes; I am referring to the head of the Morrisburg Canal where we are putting this in; I think they are practically the same. We claim this weir will raise the water at Lock 24, which we claim will be beneficial to navigation, and it will also raise the head correspondingly at the entrance to the Little River, which, of course, will be beneficial to our project.

Now, in consideration of what I have outlined here, the benefits that we derive and the benefits to navigation, that this commission authorizes, diverting through the Little River additional water at certain stages, we will maintain a uniform flow of 30,000 c. f. s. down the Little River.

We shall show this commission, by testimony not yet introduced, as to just how much water it will be necessary for us to divert and at what stages. I may say, generally speaking, if I remember the figures correctly, that when the main stream discharges about 240,000 c. f. s., which is mean low, I would say, that we will want somewhere about 3,000 c. f. s. additional. But what we claim we are entitled to is the natural flow of the stream. The State of New York is represented here, which is proper, with respect to the rights in the bed of the stream; the people represented by Mr. King are naturally careful with reference to what effect this is going to have upon navigation. The only suggestions I have heard made, so far as that is concerned, there may be others, but so far as has been disclosed in the proceedings in this case the only suggestion I have heard is that by the construction of this embankment the velocity of the water north of Canada Island would be increased. I hope to prove by our engineers, however, that while there will be some slight increase in the velocity of the water, north of Canada Island, notwithstanding that fact the velocity at that point will be less than it is at other stretches of the north channel above. Therefore the objection, if we are correct in regard to the matter, must be this, that, as we claim, that water will not be swifter at that point, after our improvements are made, and not as swift by considerable as it is farther up the stream. Therefore, if boats can pass these other stretches of the river, they can readily and easily pass this, and the benefits in general to them will be explained by some of our navigators, and which we claim will be a straight course without any side draft, and a consequent betterment rather than a detriment to the conditions as they are to-day.

We introduced several exhibits at the last hearing in proof of part of what I have stated, and I do not know that I need go over all of them now. We have introduced statutes of the State of New York, which we claim gave us the right to the use of that power at that point in 1808 and subsequently in 1826. We also introduced title deeds to the property, showing that we were the owners of the property, and we expect to prove further and connect our title from the original grant of the State of New York. We have also introduced testimony of the fact that this property has been used ever since 1908 and is now out of repair, and we are asking to have it im-

proved for the benefit of the industrial activities of that section of the country, and for the production of power, and we have shown our incorporation. We have also shown by decisions of our public service commission that we are a public service corporation with full power and authority to carry on business, and that we are actually carrying on business and have been carrying on business at that point for several years, though, of course, in a small way. And, unless this permission be granted, we might as well dynamite the dam, because it is useless as a commercially feasible project.

Mr. MIGNAULT. I do not know whether you have the evidence available, but it might be important to show how long the existing dam can stay in the river in its present condition.

Mr. VAN KENNEN. I think I can show that, but only by the evidence of our engineers.

Mr. MIGNAULT. It may be an argument in your favor, because if the existing dam were carried away the water in the Morrisburg Canal would be lowered.

Mr. VAN KENNEN. It certainly would, and it certainly would result—well, nobody of course can tell what it would result in—but if anybody is getting the benefit from that dam the possibility is that at the first freshet or with a press of ice that dam will go out, and that will be the last of it. And then the natural flow will be diverted through that river, precisely to the amount we are claiming. And, consequently, without compensating works, it necessarily will lower the level of the water on the Canadian side, and interfere with navigation in that way.

Mr. MIGNAULT. Are you in a position to show how much it would lower the level on the Canadian side?

Mr. VAN KENNEN. I would have to ask the engineer as to that, but I think I can show it.

Mr. TAWNEY. You will cover that by your testimony?

Mr. VAN KENNEN. I expect to. Mr. Lea was on the stand when this hearing was adjourned and had not concluded his testimony. I have before me here figures as to the discharge of the St. Lawrence River which I would like to introduce in evidence.

(Filed as Exhibit A–25.)

R. S. LEA, a witness produced for and on behalf of the applicant, who had been previously sworn, was recalled, and upon further examination testified as follows:

Mr. VAN KENNEN. Mr. Lea, you may proceed to explain that table.

Mr. LEA. I simply file this exhibit, which is a table showing the discharges of the St. Lawrence River from January, 1860, to the end of 1917, given by monthly means and in hundreds of cubic feet per second discharge.

Mr. MIGNAULT. From where were those data taken?

Mr. LEA. They are based on information supplied by the United States Lake Survey and independent studies and investigations of summer and winter conditions on the St. Lawrence River made by myself and other engineers.

Mr. MIGNAULT. The information is based either on official records or on surveys undertaken for that purpose?

Mr. LEA. Yes, sir; and I file it now because it differs from the preceding tables of discharges for this river in important respects.

Mr. MIGNAULT. You might state in what way it differs.

Mr. TAWNEY. You might also state whether or not those previous tables were official.

Mr. LEA. The preceding tables of discharges were tables printed in the 1910 report of the committee on the regulation of Lake Erie, which was a committee of the original Waterways Commission. That table of discharges was also based on information supplied by the United States Lake Survey and was published in 1910, but since 1910 the engineers of that survey have made several measurements which were added to the informaion on which such a table should be based covering the years 1912, 1913, 1914, and 1915, I believe; at any rate, three or four seasons, and the result of these new measurements have been to show that the old measurements were in error to a certain extent. This new table, so far as summer discharges are concerned, is based on the new information which has been obtained by the United States Lake Survey, and which has been checked by the public works department of the Dominion of Canada to the extent that they have made measurements for that purpose.

Mr. TAWNEY. Then, this is the official and corrected table of discharges during the periods covered by this exhibit, is it?

Mr. LEA. Yes.

Mr. TAWNEY. What I wanted to know was whether these corrections were made by people who were not connected with either Government, or whether they were official.

Mr. LEA. The navigation months are the result directly of the discharge equations as they are based on the United States Lake Survey work. The discharges for the winter months are not based upon them.

Mr. TAWNEY. What are they based upon?

Mr. LEA. They are based upon the readings of the gauges at the different locks in the St. Lawrence River and the studies of the winter conditions. Manifestly, no single discharge curve can be depended upon to give the discharge with ice in the river, because the conditions interfere with the method of obtaining the discharge from the reading of a gauge. The height of the water at one part of the river may be due to anchor ice in the bottom of the river, and so winter discharges are not directly obtainable from a series of measurements as are summer discharges. But these winter discharges have been obtained with great care and with the assistance of comparisons of the work of other engineers employed in the same manner, and, so far as this inquiry is concerned, and, in fact, so far as any inquiry is concerned, in my opinion, they are as correct as can be obtained. There may be slight alterations in some of the individual months, but, so far as the general flow of the river is concerned, they are correct within what would be called practical limits of error. They have no absolutely direct bearing on anything that we intend to say except that all of our hydraulic computations and calculations are necessarily based primarily upon the flow of the main river, but they do not affect any of the gauge readings. For instance, we have records of readings on the lock sills at all of the terminal locks on the St. Lawrence River Canal.

Mr. TAWNEY. Those are official readings?

Mr. LEA. Those are official readings; and this discharge table does not affect in the slightest degree those readings. It does not throw any doubt on them; it simply interprets them in a different way in the light of the new information that has been obtained by the United States Lake Survey and checked and confirmed by some official Dominion Government records made at the same point on the St. Lawrence River since 1915, and also with our own observations taken in connection with this particular matter.

Mr. POWELL. Is there any substantial difference between the two statements?

Mr. LEA. The old table gave as a minimum discharge about 152,000 cubic feet per second and a maximum of 351,000 cubic feet per second.

Mr. POWELL. A variation of about 200,000?

Mr. LEA. A variation of 200,000; from a minimum of 152,000 to a maximum of 351,000 in the course of 55 or 56 years; that is, from January, 1860, to 1917. The old table of discharges published in this report of the Waterways Commission on the Regulation of Lake Erie varied from a minimum of 152,000 cubic feet per second in February, 1902, to a maximum of 351,000 cubic feet in May, 1917.

Mr. POWELL. What was the range of variation there?

Mr. LEA. It is about 200,000 cubic feet per second. Now, the considerable difference that the new table presents is this: The minimum now in the same month of February, 1902, is about 185,000 cubic feet per second instead of 152,000, and the maximum is slightly less than 320,000 cubic feet per second instead of 351,000.

Mr. POWELL. A variation of 140,000 instead of 200,000?

Mr. LEA. Yes. In other words, the minimum has been raised considerably and the maximum lowered, and we have found that the St. Lawrence River is a much better regulated river than we had supposed; regulated by nature, I mean. It is a better river all around than we thought it was.

Mr. MIGNAULT. From your experience, do you believe these figures to be accurate?

Mr. LEA. I believe them to be accurate; yes, Mr. Mignault.

Mr. POWELL. The revised figures?

Mr. LEA. The revised figures. What I mean by that is I know that another table is being prepared by the Dominion Government engineers and the variation between the figures for the individual months and those given in this table are quite within the practical limits of accuracy; in fact, within limits such as would be hard to determine by actual measurement.

Mr. MIGNAULT. I suppose the other side will examine these figures and let us know whether they concur; so you might go on.

Mr. VAN KENNEN. I think we furnished the other side with these figures.

Mr. STEWART. You gave me a set of figures last winter. I do not know whether they are the same or not.

Mr. LEA. As a matter of fact, as I have said, some of the winter measurements might be modified slightly, but they will have no practical effect upon the matter under discussion; or, in fact, upon any matter of this kind. The question of whether the discharge for

one month varies by say 2,000 or 3,000 or 4,000 cubic feet per second from that given in another table is really of no practical importance, because we are not able to determine this matter absolutely any closer than that and perhaps not so close.

Mr. McLEAN. Could a copy of those figures be given to our engineers, Mr. Van Kennen?

Mr. VAN KENNEN. I have only one copy here just now, but I shall be glad to supply you a copy later.

Mr. LEA. I might add further that do not consider them absolutely essential to our evidence in this case, because they do not affect the question of levels. But they do differ from the old tables so materially I thought it would be well to mention the matter at this stage.

Mr. MIGNAULT. Are they the basis of the table which you put in as plate 2 with your application?

Mr. LEA. No; plate 2 is a plate which shows, among other things, the natural flow of the Little River under different discharges of the St. Lawrence River without regard to how those discharges happened to occur.

Mr. MIGNAULT. Assuming such a discharge in the St. Lawrence River, then there would be so much water flowing into the Little River?

Mr. LEA. Yes.

Mr. PERKINS. This table shows that it would increase the natural flow of the Little River—that is, it would show a larger natural flow than the tables previously put before you. In respect to the fact that these new tables show a greater minimum flow of the river and that this curve shows what water flows down the Little River under a given quantity of water flowing down the entire river, this new table will affect this proposition materially, in that it shows a larger natural flow of the Little River.

Mr. MIGNAULT. Yes; there is a consequence to the larger natural flow in the main river.

Mr. LEA. No; I think the gentleman is under a certain misapprehension. Possibly I have not explained it clearly enough. The amount of water which flows down the Little River is directly influenced by the height of the water at the entrance of the Little River. That is what determines the amount flowing down the Little River. This table of ours does not change the level which occurred at any time or in any month.

Mr. MIGNAULT. Well, Mr. Lea, the greater the flow the higher the level.

Mr. LEA. But we have changed the flow which corresponds to a given level. For instance, in the old table a depth of 16 feet on the sill of Lock 24 would give what we would call a certain discharge. Now we call it another discharge, but the height remains the same, naturally. The height in January, 1870, or in any other month has not been changed by the fact that we think the total discharge of the main river is greater or less.

Mr. PERKINS. Do you refer to heights or flows?

Mr. LEA. I refer to both.

Mr. MIGNAULT. Mr. Lea, make that clear. When Mr. Perkins refers to that flow he refers to the flow in plate 2.

Mr. LEA. The scale at the bottom of plate 2 refers to discharges of the St. Lawrence River, and those discharges have a certain meaning with regard to the height of the lock sill.

Mr. PERKINS. Were those flows given on plate 2 computed in accordance with the old table or the new table?

Mr. LEA. With both the old and new tables.

Mr. KING. Did you strike a mean?

Mr. LEA. No; I mean to say that when the depth of 16 feet on the lock sill of Lock 24——

Mr. TAWNEY. Mr. Chairman, I would suggest that we would get along better if gentlemen who wish to cross-examine Mr. Lea reserved their cross-examination until his examination in chief has been concluded. Then we can proceed in an orderly manner.

Mr. LEA. I understand Mr. Perkins's objection all right. It is because the information that might have been put on this curve is not here. For instance, we might have put a scale of elevations to correspond to those discharges, and that would have cleared up the matter.

Mr. MIGNAULT. Just let me follow you, Mr. Lea. My impression would be that the greater the discharge the higher the level. Am I right or wrong?

Mr. LEA. You are right in the way you put the question; but the discharge which occurs in the St. Lawrence River at a given height, according to our table, is larger in the low-water months than it was in the old table. The height is the same. We do not vary the height in any way. The height is given by the readings on the lock guages which have been taken there since January, 1860.

Mr. MIGNAULT. Yes; but for a given height you found a greater discharge?

Mr. LEA. Of the main river; it does not affect the Little River any because that is affected by the height of the water at its entrance.

Mr. VAN KENNEN. Is there anything further, Mr. Lea?

Mr. LEA. I was going to say that if a table of heights on lock sills were placed at the bottom of plate 2 it would apply to both the old table and the new table.

Mr. ARTHUR WHITE. Mr. Lea, if you have 183,000 cubic feet per second going down, according to the new computations, you would get more flow down the Little River than you would when there was only the 152,000 in the main river?

Mr. LEA. No. That is a very good example. The old minimum was 152,000 cubic feet per second in a certain month, which I mentioned. That corresponded to a given height at the entrance of the Little River or to a given reading on the sill of Lock 24. The 185,000 cubic feet per second, which we call the minimum, corresponds to the same reading on the lock sill and the same height at the entrance of the Little River.

Mr. ARTHUR WHITE. That is true; but you are enlarging the Little River so that you would have a greater proportion of water at the time a flow of 152,000 cubic feet per second is going down the Little River than at the time of a flow of 183,000 cubic feet per second.

Mr. LEA. No; we are not enlarging the Little River in the natural flow. The Little River is supposed not to be artificially enlarged.

Mr. ARTHUR WHITE. Well, put it this way: If you had to receive an increment of flow at the low stages in order to keep your flow up to what you wished for power purposes you would have to request a less increment with 183,000 than you would with 152,000?

Mr. LEA. Yes; that is true. If we are taking the 30,000 cubic feet per second, our increment of flow—that is, the change in flow corresponding to 1 foot rise or fall in level—is different in our new table.

Mr. ARTHUR WHITE. But you would have to request less water with 182,000 cubic feet per second than you would with 152,000 for minimum-flow conditions in order to bring the quantity up to the required flow that you would intend to use under——

Mr. LEA. No; I do not see that, Mr. White.

Mr. JAMES WHITE. What proportion of the flow is going to go down the Little River?

Mr. LEA. That varies, Mr. White.

Mr. JAMES WHITE. Approximately?

Mr. LEA. It varies from about 8 to 12 or 14 per cent, according to the stage of the water.

Mr. JAMES WHITE. Well, what at low water? The essential difference between the old and new tables simply demonstrates that at low water you get more water going down the Little River than you had supposed.

Mr. LEA. No, sir; we get exactly the same because low water, so far as height is concerned, is the same as it ever was. We only say that we thought there was a certain amount going down. The elevations remain the same, and therefore any flow like the flow of the Little River which depends upon elevation will remain the same.

Mr. JAMES WHITE. In the new table you put the minimum flow at how much?

Mr. LEA. We say the minimum flow is 185,000 cubic feet per second.

Mr. JAMES WHITE. My point is this: Eight per cent of 185,000 would be greater than 8 per cent of 152,000.

Mr. LEA. That is quite true, but then it would not be 8 per cent of 152,000. The percentages would be different with the old table than they are now, but there would be the same quantity flowing down the Little River.

Mr. JAMES WHITE. That last analysis means that you contend that while the measurements of the flow of the river were in error, your measurements of the flow of the Little River were not.

Mr. LEA. That is quite true, because they were determined by the elevation of the water and we are not suggesting that there have been any changes.

Mr. VAN KENNEN. Mr. Lea, I have here a copy of the original resurvey of the River St. Lawrence at the point in question. That, if I understand it correctly, is an official document and properly copied, is it?

Mr. LEA. Yes, sir. The tracing from which this plan has been made was obtained from the office of the United States Lake Survey at Detroit.

(The paper referred to by Mr. Van Kennen, and which he offered in evidence, was marked "Exhibit A–26.")

Mr. TAWNEY. Describe what that exhibit is, Mr. Lea.

Mr. LEA. The plan is entitled "Resurvey of St. Lawrence River, No. 5," and covers that part of the river from a point about Lock 23 on the Morrisburg Canal to a point about 1 mile above the entrance of the Little River. It also shows the depths of the water at various points below the surface corresponding to about four-tenths below minimum low water in the St. Lawrence River. These soundings were taken at two different periods which are given in a note at the bottom of the plan.

Mr. MIGNAULT. That is dated 1901?

Mr. LEA. The plan is dated 1901. The soundings given were taken in 1901 and also during a period between 1870 and 1873. A reference to the plan will show that these soundings were taken at intervals from one end of the Rapide Plat to the other and in other portions of the river. I merely file this because, so far as I know, it is our best plan so far as soundings go, but at the same time I wish to state that soundings in the Rapide Plat are not very reliable.

Mr. MIGNAULT. Why not?

Mr. LEA. On account of the difficulty of obtaining them. They are reliable for certain purposes, but possibly not for others.

Mr. MIGNAULT. I suppose these soundings in the Little River indicate the depths under existing conditions?

Mr. LEA. They indicate the depths as shown in the note at the bottom of the plan, the note under the title. The note begins, "Soundings are in feet, reduced to standard low-water plane, corresponding to elevation 243 in Lake Ontario," which refers, I believe, to the gauge at Oswego, N. Y. And I add again that that elevation 243 was not reached during the period since January, 1860. The lowest that was reached was 243.41.

Mr. MIGNAULT. What is the zero of that datum?

Mr. LEA. The sea-level datum at New York.

Mr. VAN KENNEN. Mr. Lea, have you made computations of the discharge between the two islands and between Canada Island and the north shore?

Mr. LEA. I have made computations of the discharge under present conditions between Canada Island and Ogden Island and between Canada Island and the north shore.

Mr. VAN KENNEN. I am offering in evidence here a diagram showing that discharge. [The diagram referred to was marked "Applicant's Exhibit 27."] Now, explain that diagram, Mr. Lea.

Mr. LEA. That diagram is intended to show the relative proportions of the present flow down the Rapide Plat, which goes between Ogden and Canada Islands, and between Canada Island and the north shore.

Mr. POWELL. That is exclusively Canadian water, so far as ownership is concerned?

Mr. VAN KENNEN. No; I think not. Part of it is in American waters. The international boundary line goes between Ogden Island and Canada Island.

Mr. POWELL. Then Canada Island is a Canadian island?

Mr. VAN KENNEN. Yes, sir.

Mr. LEA. Along the foot of the diagram is a scale marked "Discharge of Rapide Plat in thousands of second-feet," and it reads

from 180,000 up to 340,000; that is, it covers the range of flow of the river.

Mr. TAWNEY. From 180,000 to 340,000 cubic feet per second?

Mr. LEA. Yes, sir. That, of course, is a little beyond the range in each direction, because, as I said before, our present idea of the range is between 185,000 and 320,000 second-feet; so this covers a little more than the range.

Mr. GARDNER. That includes all the water passing down the north channel, does it?

Mr. LEA. That represents the water which at present passes down the north channel. The upper line is marked "Canada-Ontario Channel." The lower one is marked "Canada-Ogden Channel" and refers to the channel between Canada Island and Ogden Island. The scale at the bottom represents the discharge of the river in thousands of second-feet at the present time, and very nearly the total flow of the river; all but what goes down the Little River.

Mr. POWELL. Is this bank along the north shore there an artificial bank?

Mr. LEA. It probably is in some places, but I do not think it is all the way. I mean the canal is usually excavated a little inland for ease of construction.

Mr. POWELL. And the excavation is thrown into the river, is it? How do they dispose of the excavation there?

Mr. LEA. I do not know.

Mr. TAWNEY. Is the north bank of the river natural or artificial as a result of the construction of the canal?

Mr. TUCKET. It is artificial.

Mr. LEA. Just what it is at present it would be hard to say. It was built in 1888, I think.

Mr. GARDNER. Have you the percentage of water that flows between Canada Island and Ogden Island as compared to the whole flow?

Mr. LEA. Yes, sir; I am going to refer to that now. The diagram shows the total flow down the rapids, and the part flowing between Canada Island and Ogden Island is shown by the lower curve. For instance, suppose the flow at the Rapide Plat is 240,000 cubic feet per second. The diagram will show that the quantity flowing between Ogden Island and Canada Island is about 87,000 cubic feet per second, and the quantity flowing down the channel between Canada Island the Ontario shore is 153,000 cubic feet per second.

Mr. MIGNAULT. What do you mean by the discharge of the Rapide Plat?

Mr. LEA. The quantity going down the north channel, or the Rapide Plat.

Mr. MIGNAULT. You mean by the north channel the channel between Ogden Island and the north shore?

Mr. LEA. Yes, sir.

Mr. TAWNEY. And that you call the Rapide Plat?

Mr. LEA. That is the Rapide Plat.

Mr. POWELL. Have you the subdivision of water made by Clarkes Island?

Mr. LEA. No; it is not shown on that diagram.

Mr. MIGNAULT. At what point is that discharge of the Rapide Plat estimated?

Mr. LEA. The discharge down the Rapide Plat is the discharge of the St. Lawrence River less what goes down the Little River, which is in the neighborhood of 3,000 or 4,000 second-feet.

Mr. TAWNEY. At what point?

Mr. LEA. As a matter of fact, the discharge down the St. Lawrence is practically the same from Lake Ontario to Lake St. Francis. The quantity which goes in from the small rivers does not appreciably affect that quantity.

Mr. MIGNAULT. It is the discharge of the whole river minus what goes down the Little River?

Mr. LEA. That is what is referred to as the discharge down the Rapide Plat on this diagram.

Mr. POWELL. The discharge down the Little River is about one-eighth?

Mr. VAN KENNEN. It is about one-tenth.

Mr. MIGNAULT. That is under present conditions, Mr. Van Kennen, or under the conditions which you call natural?

Mr. VAN KENNEN. Under the natural conditions.

Mr. MIGNAULT. Under actual conditions it would be less?

Mr. VAN KENNEN. I do not suppose there would be more than 3,000 or 4,000 cubic feet, because the dams are in the way.

Mr. MIGNAULT. I think it was stated at Atlantic City that not more than 2 or 3 per cent of the whole river goes down now, under present conditions, through the Little River.

Mr. VAN KENNEN. I should say not to exceed 4,000 or 5,000 cubic feet.

Mr. MIGNAULT. But what Mr. Lea means as the discharge of the Rapide Plat is the discharge of the whole river less what goes down under existing conditions by the Little River.

Mr. LEA. Yes, sir; it practically represents the flow of the St. Lawrence River, because the other is so small that you can leave it out of account, if you like, in this connection.

Mr. VAN KENNEN. If there is nothing more with reference to the explanation of that particular plate, I would like to ask if you calculated the effect of the embankment between Ogden Island and Canada Island upon the stage of the river adjacent thereto and upstream, known as the backwater effect?

Mr. LEA. Yes; I did.

Mr. VAN KENNEN. Will you explain that?

Mr. POWELL. Preliminary to that, have you a profile of that international channel?

Mr. VAN KENNEN. I think it is on the original plate.

Mr. LEA. It is shown on plate 1 with the embankment across it. I calculated the backwater effect.

Mr. KEEFER. You are speaking of after the construction of the dam?

Mr. LEA. Yes; I calculated the backwater effect under the conditions that I presumed would exist; that is to say, with 30,000 cubic feet per second going down the Little River. The effect of the embankment is to cut off the proportion of the flow down the Rapid Plat which would pass between Ogden Island and Canada Island

and force it through the channel between Canada Island and the north shore. The effect of that again, of course, would be to raise the surface of the water north of the embankment, because we will be forcing a larger quantity of water through the same channel.

Mr. MIGNAULT. Have you estimated the amount of elevation?

Mr. LEA. Yes, sir. The elevation of the water, of course, depends upon the stage of the river again. My only object in determining what that backwater effect would be was to determine its effect upon the shallow portions of the rapids which we have been referring to as the Hogs Back; so I did not consider it necessary to determine what the backwater effect would be at all stages of the river, but merely at the stage that would concern navigators down the rapids and over this Hogs Back.

Mr. MIGNAULT. During the navigation season?

Mr. LEA. During the navigation season and at such times or at such stages of the river that they would be concerned with the depth upon the Hogs Back, because during high water they have plenty of water and during low water they can not run the rapids at all.

Mr. GARDNER. Your idea is that the practical effect of this weir would be to slow up the rapids in the north channel above?

Mr. LEA. It would; yes.

Mr. GARDNER. It would not reach up to the upper end of Ogden Island, of course?

Mr. LEA. Yes; in my opinion some of it would back up as far as the upper end of Ogden Island. The point of interest, according to my idea, to navigators is the stage of the river when the reading on the sill of Lock 28 is about 16 feet or 16.1, and the reading, as it happens, on Lock 24 is about the same amount.

Mr. MIGNAULT. Where is Lock 28?

Mr. LEA. It is farther up the river. It is not shown on any plans we have here and it does not concern this matter, except when the navigators are going down the river it is the first point at which they can leave the canals and go into the river itself. It is up near Lock 27, the first of the canals of the St. Lawrence River near Lake Ontario.

Mr. MIGNAULT. Do you call it the Cardinal?

Mr. LEA. It is farther up.

Mr. GARDNER. It is the first one you come to below Prescott?

Mr. LEA. Yes, sir.

Mr. POWELL. In other words, that is an index as to the state of affairs below for the navigators?

Mr. LEA. Yes; and when they get there and know what the reading on that gauge is they know whether they are able to shoot the Rapide Plat or not. That stage of 16.1 on the lock sill of Lock 28 corresponds to a flow of about 222,500 cubic feet per second all the way down the river. I chose that particular point as the point at which I would calculate the effect of the backwater caused by the embankment between Ogden Island and Canada Island because that is the limiting stage of the river at which boats can shoot the rapids, and I desired to ascertain whether the effect of this embankment would be sufficient after we had diverted 30,000 cubic feet per second down the Little River to maintain the level across the Hogs Back as high as it is under present conditions. The result of my calculations of

backwater is this: That at that period the depth on the Hogs Back will be from 4 to 6 inches greater than it is at the present time. In other words, the boats drawing 14 feet will not only be able to shoot the rapids at that stage of the river, which they do at present, but will be able to shoot them for a considerable period longer; that is, at lower stages of the river.

Mr. POWELL. At what draft can vessels shoot the rapids there?

Mr. LEA. The navigation of the St. Lawrence River Canal is referred to as 14-foot navigation.

Mr. MIGNAULT. At what point will that increase of level be?

Mr. LEA. That will increase the level to a maximum opposite the embankment itself, just north of it. That backwater will die out as it goes upstream, and it will carry back, so far as present levels are concerned, a mile or so past the Hogs Back. When I say "carry back" I mean carry upstream.

Mr. MIGNAULT. When you speak of the Hogs Back it is the place where you will build your embankment?

Mr. LEA. No; the Hogs Back is the shallow part of the rapids. It is a point opposite what is known as the old dock.

Mr. MIGNAULT. It is practically opposite the words "Morrisburg Canal" on Exhibit A–26?

Mr. LEA. Yes; it is opposite a point about halfway down Ogden Island, where a small dock is shown?

Mr. VAN KENNEN. Will you please mark it on the exhibit?

Mr. LEA. The old dock which I have just referred to is indicated on Exhibit A–26 by the letter "X" inclosed in a circle. The navigators all know the point, because the greatest disturbance to the flow is across there; and one of the effects of this embankment in causing backwater will, in my opinion, be to tend to drown out and smooth out those swells.

Mr. MIGNAULT. What difference in height of water will there be at the point indicated as being the Hogs Back.

Mr. LEA. From 3 to 6 inches more than there is now at the corresponding stage of the river.

Mr. MIGNAULT. Opposite the Hogs Back what would it be?

Mr. LEA. That is the point I refer to, the Hogs Back.

Mr. MIGNAULT. There would be a difference to the good; that is to say, a greater height of water from 3 to 6 inches at the Hogs Back?

Mr. LEA. Yes, sir.

Mr. TAWNEY. According to this map, what is the depth of the water at the Hog's Back now under normal conditions?

Mr. LEA. There are very few soundings shown there. By looking at the scale on the map you can see the distance represented by hundreds of feet. There are spaces there of four or five or six hundred feet with no soundings whatever. That is characteristic of the map, and that is why I consider that the map as affording a basis for hydraulic computations is unreliable.

Mr. TAWNEY. How do you estimate the depth of water at the Hog's Back?

Mr. KING. By touching.

Mr. POWELL. What draft vessels run through there?

Mr. KING. Fourteen feet if the stage of the river is correct for that, but you may have to wait up at Cardinal until the wind blows the other way to get down.

Mr. VAN KENNEN. The full canal size of the vessels is 14 feet. If it gets lower than that they can not go down the canal.

Mr. LEA. One may get some idea of what that means in this way: When these 14-foot boats are touching at times on the Hog's Back there is still 16 feet of water on the lock sill of lock 24.

Mr. KING. Then Mr. Van Kennen was not quite right in saying that you could not get down the canal. A difference of 2 feet might exist. You mentioned lock 24 when I was mentioning lock 28 before, but Mr. Lea pointed out that they were both the same.

Mr. VAN KENNEN. The point of introducing this part of the testimony is to show that there will be from 3 to 6 inches more water over the Hog's Back than there is at the present time.

Mr. LEA. I might interject the comment that 3 to 6 inches may sound small, but that the whole result of diverting 30,000 second-feet is a matter of inches, even if we did nothing to compensate for it.

Mr. TAWNEY. Mr. Lea, I want to ask you whether with this addition to the height of the water at the Hog's Back the water would be more or less available to wind conditions than at present?

Mr. LEA. Well, what I should say about that is that the swells would be less and so the effect of an upstream wind would be less; the combination of an upstream wind and swells. Besides the effect of the backwater in deepening the water and holding it up even higher than it is at present, the quantity of water flowing at that depth is less by the amount that we propose to divert through the Little River, and that also is an improvement.

Mr. MIGNAULT. The 3 to 6 inches at the Hog's Back allows for the diversion of 30,000 cubic feet per second at the Little River?

Mr. LEA. Yes, sir.

Mr. POWELL. It is the resultant of all the changed conditions?

Mr. LEA. Yes, sir.

Mr. VAN KENNEN. If we view this from the compensatory standpoint, and taking our view that we are entitled to the natural flow of the stream, and the mean normal flow of the river we would ask for only 3,000 cubic feet additional, you can see that our compensation is very great.

Now, I thought in this connection you might also explain, Mr. Lea, if you have computed the effect upon the tailrace of our power plant.

Mr. LEA. The effect upon the tailrace of the cutting off of the quantity of water flowing between Ogden Island and Canada Island would naturally be to lower it somewhat. The river there is wide and the effect will not be very great, but it will probably be a matter of 4 or 5 inches at ordinary stages of the river; and in horsepower, if the total 30,000 cubic feet per second are developed, it will be under 1,000.

Mr. VAN KENNEN. Did you also make some calculations with reference to the velocity of the water north of Canada Island after the embankment was put in and the comparative velocity at that point with the velocity up stream?

Mr. LEA. I did.

Mr. VAN KENNEN. I want to introduce a diagram showing that.

(Filed as Exhibit A–28.)

Mr. VAN KENNEN. Would you explain the meaning of that diagram.

Mr. LEA. The diagram, Exhibit No. 28, is intended to show the velocity in the channel between Canada Island and the Ontario shore, under present conditions, and with the proposed embankment between Canada Island and Ogden Island and a flow of 3,000 c. f. s. down the Little River. In general terms, of course, we know that if we block one of the channels and force all the waters down the other channel, we are bound to increase velocity. At the same time we know that if we divert 30,000 c. f. s. down the Little River where only 3,000 c. f. s. is flowing now, that we will tend to decrease the velocity. That is an illustration of the effect that this diagram gives. The effect of the increased passage down the channel between Canada Island and the north shore is also modified by the fact that the water will be deeper and the cross-section will be greater, and so the velocity will tend to diminish on that account. Turning now to the diagram we see that at this critical stage which I refer to, when the boats can just shoot the rapids and no more, there is a little over 220,000 c. f. s. flow in the main river; the present average velocity is about 6.3 feet per second.

Mr. POWELL. How many miles an hour would that be?

Mr. LEA. It would be two-thirds of that; a little over 4 miles. And the corresponding velocity, after the proposed 30,000 c. f. s. is taken and the proposed improvement installed, will be slightly over 9 feet per second.

Mr. TAWNEY. About 6 miles per hour.

Mr. LEA. Slightly over 6 miles per hour. Describing the diagram a little further, the scale along the bottom of the diagram is again the discharge down the Rapid Plat, the discharge of the main river less the small amount going down the Little River, and the vertical scales on each side of the diagram show the velocities in the channel between Canada Island and the Ontario shore in feet per second.

Mr. TAWNEY. In that part of the river in which the velocity is increased, are there any natural obstacles that render navigation hazardous?

Mr. LEA. Not that I am aware of. In view of the fact that the effect of the embankment will be to straighten the current and keep off the side draught which exists at the present time, I think the navigation difficulties will be decreased.

Mr. TAWNEY. Are there any obstructions in that part of the river where the velocity is increased? Are there obstructions in the bed of the river; is it a clean channel?

Mr. LEA. It is a good clear channel.

Mr. GARDNER. After you pass the upper point of Canada Island the navigation course is practically a straight line down the river.

Mr. LEA. Pretty straight.

Mr. MIGNAULT. There is a considerable depth of water at that point.

Mr. LEA. There is lots of water there at the present time.

Mr. POWELL. Is there any navigation upstream through that north channel?

Mr. LEA. Yes; the passenger steamers of the Canada Steamship Lines pass up the rapids.

Mr. POWELL. They do not go through the canal?

Mr. LEA. At certain times. They usually go through the locks; but they do at times go through the rapids.

Mr. KING. I will put in definite evidence on that point; I have the masters of the steamers present.

Mr. VAN KENNEN. I understand that there is little navigation, but that the passenger boats of the old Richelieu Line do go up on the outside, as they claim. I do not know how frequently that is; but we make no claim on that point—let me ask you about the velocity farther upstream in that same channel; have you made any calculations upon that?

Mr. LEA. Yes. I only was interested in comparing the increased velocity in the channel between Canada Island and the north shore with the velocities which exist at the present time in the Rapide Plat, the maximum velocities which the Richelieu & Ontario Navigation boats, when they do go up, have to encounter. It happens that a series of measurements of velocity were made at my request some years ago by Mr. Tucker, by means of floats set out above Lock 24 and observed at fixed intervals down the rapids by observers there with watches, so that they were enabled to time these from the starting point to Lock 23. By means of these observations we were enabled to determine pretty closely what the maximum and average velocity would be down the rapids at the different stages. A certain stretch, which you might consider the middle stretch, 5,880 feet long, or something over a mile in length, gave the highest velocity, and the velocities there are higher than will exist north of Canada Island after the improvements are put in place, and if the backwater is as high as I believe it will be.

Mr. POWELL. That is relative. What are the actual velocities?

Mr. LEA. In this case, for instance, the maximum average velocity was something over 9 feet per second.

Mr. POWELL. A little over 6 miles an hour.

Mr. LEA. Down the rapids at the present time the corresponding figure in the swiftest part of the rapids is, in my opinion, 25 to 30 per cent greater, and possibly more, than across the pitches.

Mr. POWELL. That would be about 8 miles an hour.

Mr. LEA. At least.

Mr. VAN KENNEN. You acquired this information by the most improved methods of determining velocity.

Mr. LEA. Yes. One set, comprising seven floats, we sent down at varying distances across the river, and the other set, comprising five floats, we sent down at varying distances across the river, and once they started they followed their own path.

Mr. POWELL. Is there much difference between the central section of the river and the sides?

Mr. LEA. Not more than the ordinary; it is slightly greater in the deeper part of the channel and the center of the stream.

Mr. MIGNAULT. Do you find it to be the fact that the present velocity in the Rapide Plat is greater than the velocity that would exist north of Canada Island when the weir is constructed?

Mr. LEA. Yes, sir; in my opinion, without any doubt whatever.

Mr. MIGNAULT. How much greater?

Mr. LEA. As I say, probably 25 per cent, and I think in the pitches more than that.

Mr. TAWNEY. In one case it is 6 and 8 miles an hour, approximately.

Mr. LEA. What is the question?

Mr. TAWNEY. In one case your maximum velocity is 6 miles and in the other 8 miles.

Mr. LEA. That difference measures the present conditions above and the conditions as they will exist when the weir is in. That will be adding about 33 per cent. The 6 miles per hour and the 8 miles per hour are average velocities, and the maximum velocities are naturally greater than this. But in making a comparison one must always use average in both cases or maximum in both cases, and in the case of the velocities we use the average figure. But the comparison is the same as if we had in both cases used maximum velocities.

Mr. VAN KENNEN. Are you able to state what the effect would be if this embankment were placed there, upon navigation at that point?

Mr. LEA. The effect on navigation at that point?

Mr. VAN KENNEN. At and opposite the embankment.

Mr. MIGNAULT. That has been explained; it does away with the cross draft.

Mr. LEA. Yes; it does away with the side draft, which tends to cause boats to go aground on the shoal between Ogden and Canada Islands and thereby straightens the stream lines and makes the steering better at that point on the river.

Mr. VAN KENNEN. What effect would it have upon the velocity of the water immediately north of Canada Island?

Mr. LEA. That is just what we have been talking about.

Mr. VAN KENNEN. You spoke about the increased velocity.

Mr. LEA. It would increase it to the extent I have already referred to.

Mr. VAN KENNEN. But what I am speaking about—from the Hogs Back down there to that point, would the velocity be as great as it is now?

Mr. LEA. From the Hogs Back down to the foot of Ogden Island, of course, the velocity would be less than it is now, for the reason that the water is deeper and the quantity of water flowing is less.

Mr. MIGNAULT. And the water is backed up?

Mr. LEA. The water is backed up, and therefore the depth is greater.

Mr. VAN KENNEN. In our application we also add what was called a submerged weir at what I call the head of the Rapids Plat, at point E; I would like to introduce a cross section showing that and have that explained.

(Filed as Exhibit 29–A.)

Would you explain that, Mr. Lea?

Mr. LEA. That shows a cross section of the river at a point opposite Lock 24, from soundings taken by ourselves especially for the purpose, and it shows the areas to be filled with the dredgings from the deepening of the Little River up to a point which at low water shows an approximate depth of 22 feet.

Mr. MIGNAULT. Over the weir?

Mr. LEA. That is the filling in, which has been referred to as the weir, as shown by the shaded portion on the plan. The extent of that filling is the maximum that would be required in order to more than restore conditions of depth at the sill of Lock 24.

Mr. GARDNER. How would that result with respect to the depth of the water?

Mr. LEA. I do not know exactly how much the depth of the water would be at this point, but I should say 5 or 6 feet deeper—14 feet of pitch in the shoals going over the Hogs Back—and this gives at least 22 feet, and if there is any objection to 22 feet, we are willing to modify that if necessary.

Mr. GARDNER. Do you know what the average depth of that channel is, from this place where the proposed weir is to be located and the head of the Hogs Back Rapids?

Mr. LEA. I do not know what the average depth is. I should say it is 20 feet. The maximum depth is a good deal more than that.

Mr. MIGNAULT. I understand you that the only point of difficulty in the Rapide Plat is the Hogs Back; independently of that, there is ample water for navigation.

Mr. LEA. So far as I know, yes.

Mr. MIGNAULT. At the point where the fill would be made, you would leave, over and above the fill, at least 20 feet of water?

Mr. LEA. More than 20 feet; at least 22 feet. I do not think we would require 22 feet, but that particular diagram shows it that way, and there would be at least 22 feet under the conditions that would exist if this application were carried out.

Mr. MIGNAULT. Which would be several feet deeper than at the Hogs Back in what you would deem the critical condition of the water.

Mr. LEA. Yes.

Mr. VAN KENNEN. Can you give us, approximately at least, the distance between the upper reach of the Hogs Back and the proposed submerged weir?

Mr. LEA. Between the Hogs Back and the proposed submerged weir?

Mr. VAN KENNEN. Yes.

Mr. LEA. There is a scale on the map which will show that; it is a mile and a quarter, at least.

Mr. VAN KENNEN. Do you recall whether you stated from your observation, or only approximately, the width of the so-called Hogs Back?

Mr. LEA. I did not say that.

Mr. VAN KENNEN. Had you any information that would give you that?

Mr. LEA. Nothing except the soundings shown there.

Mr. VAN KENNEN. I understand it is about 200 feet approximately.

Mr. LEA. At the shallowest part of the river it seems to be something like that, but the distance in which the disturbance of the river occurs is somewhat greater.

Mr. VAN KENNEN. I do not think you have yet explained, in connection with this last exhibit, the purpose of it and the effect of it.

Mr. LEA. The purpose of it is to increase the level of the water.

Mr. MIGNAULT. That is not the purpose of the exhibit; it is the purpose of the weir.

Mr. VAN KENNEN. What I want is the purpose of the weir.

Mr. LEA. The purpose of the weir, or the shallowing of the channel at that point, is to increase the level of the water at Lock 24, and at the entrance of the Little River, and, of course, down our fore bay.

Mr. MIGNAULT. By how much?

Mr. LEA. So far as Lock 24 is concerned, 3 or 4 inches would be sufficient to permit the boats to enter loaded to full draft at any stage.

Mr. GARDNER. How does the depth of the water correspond at the point where you propose to construct this weir up to the upper point of Ogden Island?

Mr. LEA. The water above the point where the proposed weir is to be placed is deeper, considerably deeper. There are holes there 55 and 60 feet deep.

Mr. MIGNAULT. I have not got from you yet, or perhaps I did not understand your answer, the increase in depth at Lock 24.

Mr. LEA. We could increase it if we were to put in such fill as is shown by the exhibit last filed by nearly a foot.

Mr. VAN KENNEN. It depends, of course, upon the extent of the fill as to the increase.

Mr. LEA. Yes.

Mr. MIGNAULT. At what you have already termed several times to be the critical stage—that is, a total discharge of about 220,000 c. f. s.—what would be the increase in depth at Lock 24?

Mr. LEA. That would be about six-tenths of a foot under present conditions.

Mr. VAN KENNEN. I would like to introduce another diagram of comparative depth on the sills of Locks 24, 21, and 15, and have Mr. Lea explain that diagram.

(Diagram filed as Exhibit 30–A.)

Mr. VAN KENNEN. Would you explain that?

Mr. LEA. This diagram shows the depth on the sill of Lock 15——

Mr. MIGNAULT. Where is Lock 15?

Mr. LEA. It is the lowest lock in the Cornwall Canal.

Mr. MIGNAULT. And Lock 21 is the entrance?

Mr. LEA. Yes; the highest lock. This diagram shows the depth of Lock 15 and Lock 21 as it was and Lock 24 under present conditions corresponding to various discharges of the main river. It shows the depth on the sill. The scale of discharges in the main river are given along the bottom of the diagram, and the depth on the sills in feet are given on the vertical scales on each side of the diagram. It also gives the depth which we have calculated will be found on the sill of Lock 24, with the embankment in place, and a discharge down the Little River of 30,000 c. f. s.; that is, the lower of the two dotted lines on the diagram. It also gives the depth which will be found on the sill of Lock 24 with the embankment in place and the submerged weir fully constructed at the point E and 30,000 c. f. s. withdrawn through the Little River; so that that diagram enables a comparison to be made of the present depth on Locks 15, 21, and 24, and those which will occur, first, with the embankment in place only, and, second, with the embankment and the submerged weir in place to its fullest effect.

Mr. MIGNAULT. Your diagram does not show the depth on Lock 24 under present conditions?

Mr. LEA. Yes, sir; the highest line shows that.

Mr. VAN KENNEN. Would you mind giving some comparative stages and saying what the diagram shows at a certain passage of the river?

Mr. LEA. Suppose we take 220,000 c. f. s. that we have been talking about, the depth on Lock 15 is 14.8 feet.

The present depth on Lock 24 is 15.85 feet and the depth on Lock 21 would be 15.2 feet, about. That is, in years gone by the depth of these three locks would be as follows:

Lock 15	14.8
Lock 21	15.2
Lock 24	15.85

which shows that the depth of Lock 24 is greater than the other two locks. I mention Lock 21 here because it was included in the diagram some months ago, but it, of course, would be more or less altered—probably increased—by the works going on on the other side of the river.

Mr. MIGNAULT. The point of your suggestion is that the same boats go through both canals.

Mr. LEA. The point is that if they can get through Lock 15 at that stage of the water they will have one foot more water at Lock 24.

Mr. TAWNEY. And Lock 15 is how far below the works?

Mr. LEA. It is part of the canal through which the boats have to pass; they can not shoot the Long Sault.

Mr. VAN KENNEN. Every boat has got to go over Lock 15 except the Richelieu & Ontario downstream boats; every freight boat goes over that lock; and this diagram is intended to show that if you can go over that you have plenty of water over Lock 24. Is there anything else in reference to that exhibit?

Mr. MIGNAULT. Just this, the actual depth in these locks shown on the diagram you have filed are taken from official data.

Mr. LEA. In every case.

Mr. TAWNEY. In your judgment, Mr. Lea, on the whole, and as a result of the development contemplated by the applicants, navigation through the locks of the canal, as well as navigation through the channel north of Ogden Island, will be improved rather than deteriorated.

Mr. LEA. Yes, sir.

Mr. MIGNAULT. Just this point, Mr. Lea, have you considered the effect of these works in case the canals were deepened?

Mr. LEA. Yes, sir.

Mr. MIGNAULT. I do not want to put you a question ahead of any question which Mr. Van Kennen wishes to put; but you have considered that point.

Mr. LEA. I have, sir.

Mr. POWELL. That would not affect the canals if you deepened them.

Mr. MIGNAULT. It is an important point.

Mr. LEA. If the river were canalized; instead of having canals lateral to the river, if the river itself were made a channel——

Mr. POWELL. That is another proposition; that is not deepening the canals. That is substituting canals. If you deepen the present canals, it would not have any effect on your work.

Mr. LEA. No. It would leave the levels of the water the same. I was going to say that there is this effect on navigation, which I did not mention: One small effect of the submerged weir would be to check the flow of the water immediately above it, and to that extent it would probably help the approach of boats to Lock 24.

Mr. GARDNER. Do you contemplate widening the entrance of the Little River channel?

Mr. LEA. Our plans for obtaining the greatest head that we can from the water contemplate both widening and deepening it. But our plan, so far as diverting water or altering levels or anything of that kind is concerned, does not involve a deepening or a widening.

Mr. VAN KENNEN. It seems to me, in connection with that question, that I should again state this: That we do not contemplate excavating at the entrance of the Little River for the purpose of diverting more water, but merely for the purpose of permitting the natural flow of that stream, which we claim, of course, we are entitled to, to approach the hydraulic works at such velocity as will give us the greatest efficiency. I hope I have made that clear; I want to make it clear.

Mr. GARDNER. How do you arrive at your calculations as to what the natural flow of the river would be?

Mr. VAN KENNEN. I expect to put in a witness to show that.

Mr. LEA. I should add something to my last reply. As to the deepening and widening of the entrance of the river, it is necessary to deepen and widen it to obtain 30,000 c. f. s. when the 30,000 c. f. s. is greater than the natural flow, which is true at the lower stages of the river.

Mr. POWELL. That follows as a matter of course; if you put in a dam you lessen the current.

Mr. LEA. If we had not any dam there at all, at the lowest stage of the river we could not get 30,000 c. f. s. through, because it is more than the natural flow at the lowest stage of the river.

Mr. VAN KENNEN. We were at that point when we adjourned our meeting before. This diagram is supposed to show, and it has already been introduced in evidence, how much supplemental water, over and above the natural flow, would be required to maintain a continual flow of 30,000 c. f. s. at all stages of the river, and Mr. Lea will explain that.

Mr. LEA. Plate A, Exhibit 22, shows along the bottom the total discharges of the River St. Lawrence. It shows also in the fourth line, at the bottom of the diagram, a scale of supplemental water required to maintain 30,000 c. f. s. in the Little River in thousands of cubic feet per second, and the vertical scale at the right hand side shows the percentage of time that the various quantities of supplemental water will be required. It shows, for example, that at the stage of the St. Lawrence River of 220 000 c. f. s. that 7,400 c. f. s. extra or supplemental water would be required to make up the 30,000 c. f. s. referred to, and that that much water would be required for the stream between 3 and 4 per cent of the time.

Mr. VAN KENNEN. Of the navigation time?

Mr. LEA. Excuse me, its 6 per cent of the navigation time; the curve is marked there during navigation season.

Mr. VAN KENNEN. Of course, that is the extreme low condition of the river; take the normal condition of the river, 240,000 c. f. s.

Mr. LEA. Take the average flow of the river, which is 247,000 c. f. s., the quantity required would be about 1,600 c. f. s. at that stage, and it would be required for about 37 per cent of the time, that small quantity of water.

Mr. VAN KENNEN. Of the navigation time?

Mr. LEA. Of navigation time.

Mr. VAN KENNEN. In other words, at the normal stage of the river, what we are asking for is approximately 1,500 c. f. s. additional water for 37 per cent of the navigation time. This diagram, of course, shows the amount at all stages, and shows, of course, at certain stages they would not require any supplemental water. In the very low stages of the water, Mr. Lea has explained what it would be at 220,000 c. f. s.

Mr. LEA. The average flow of the Little River, under our estimate, is nearly 30,000 c. f. s.

Mr. POWELL. Under natural conditions?

Mr. LEA. Yes. The flow that would occur there under natural conditions, when the river is at its average stage, would be very nearly 30,000 c. f. s.

Mr. MIGNAULT. At the time you require additional water?

Mr. LEA. We base that on the navigation season. If you want to find what it will be the whole year, including the winter months, you can take the lower curve, but so far as navigation interests are concerned, the percentages I gave are correct, according to the scale.

AFTER RECESS.

The commission reconvened at the expiration of the recess.

Mr. VAN KENNEN. Mr. Chairman, we are through with the direct examination of Mr. Lea.

Mr. TAWNEY. Mr. Lea, before your cross-examination, for my own information, I would like to ask whether or not, in the event this applicant secures the approval of its proposed works in the St. Lawrence River and the authority of both Governments in whose jurisdiction they are to be located, it will in any way interfere or conflict with any general scheme that may hereafter be agreed upon by the two Governments for the improvement of navigation, so as to admit of the navigation of vessels of greater draft than are now navigating the river, or the geenral development of power wherever power development is possible on the St. Lawrence River? Will this in any way interfere with that possible development, either in the matter of navigation or in the matter of power hereafter?

Mr. LEA. No, sir; I do not think it will. I think that the power house placed as suggested will be incorporated naturally with the proposed damming or development of power at that point. Of course, the embankment would have to be removed, probably.

Mr. TAWNEY. You mean between Ogden Island and Canada Island?

Mr. LEA. Yes, sir; it would have to be dredged out, the same as some other dredging would be required to be done.

Mr. MIGNAULT. Would it stand in the way of a development in the north channel?

Mr. LEA. No; it would not stand in the way of a proper development of that river in any way. Mr. Mignault, I have considered that point at considerable length—I mean the possibility of how that river could be developed for the purpose referred to—and so far as I can see this thing will naturally incorporate itself with the

best method of development, and, in fact, the only method of development.

Mr. TAWNEY. So that as an engineer you state that in your opinion this proposed work would not seriously conflict with any possible development, either in the interest of navigation or power, that the two Governments may agree upon generally for that purpose?

Mr. LEA. No, sir; I think it is quite in line with it.

Mr. TAWNEY. It would be quite in line with any possible development that they might agree upon?

Mr. LEA. Yes, sir.

Mr. TAWNEY. Now the gentlemen may cross-examine, Mr. Chairman.

Mr. MAGRATH. Mr. Koonce, have you any questions to ask the witness?

Mr. KOONCE. No, sir; I have not, Mr. Chairman.

Mr. KING. I would like to ask Mr. Lea a few questions. I would like, Mr. Lea—very briefly from you, please—some indication of the method taken to compute the effect of the backwater due to building of the embankment between Ogden Island and Canada Island, which is said to give certain additional depth over the Hogs Back. Could you briefly explain to me how you arrived at your conclusion?

Mr. LEA. That is more or less a technical answer that you require, and it is pretty hard to explain except in technical terms; but I may say, first of all, that I estimated the effect of that backwater in three independent ways.

Mr. KING. Would you mind giving us one of those ways?

Mr. LEA. One of those ways was the result of observations of the backwater created at Lock 24 and higher up by the jams below Lock 23 in the years 1887 and 1905. That could scarcely be called a method of calculation, because it was really a series of observations which connected the backwater produced at Lock 24 and farther up with different backwaters produced at Lock 23 by the ice, which was the artificial obstruction at that time.

Mr. KING. Did you make any observations with regard to those backwaters?

Mr. LEA. We did not. We simply took the readings of the gauges at the two locks. Those would probably be right within two or three tenths.

Mr. KING. Lock 23 being where?

Mr. LEA. It was where the great rise took place. Lock 23 is at the lower end of the Morrisburg Canal. Lock 24 is at the upper end and the backwater there was less than that produced at Lock 23.

Mr. KING. Then one method was to compare the readings at Lock 23 and farther on?

Mr. LEA. Yes.

Mr. KING. Another method—the second one?

Mr. LEA. Another method was to utilize the discharge-velocity measurements, which I referred to this morning, to obtain the necessary hydraulic data to perform the ordinary backwater calculations which are known to all engineers. I do not think I can explain it to you.

Mr. KING. I think I understand your meaning. You base the probable amount of backwater at a certain distance farther up the river upon the difference in velocities?

Mr. LEA. No; I base it on the usual hydraulic formula that is used by hydraulic engineers in estimating backwater, but in obtaining the data which are necessary in using that formula I employed instead of the actual soundings in the rapids, which I thought were more or less unreliable, what was a more correct and better method, and that was to get the same data, the hydraulic radius and the proper cross section of the river, by utilizing the velocities which I measured in the river, the known width of the river and the known discharges of the river. Those three quantities would give us what is called the hydraulic radius and also the effect of cross-sectional area better than we could obtain them by using the soundings in the river. I might have used the soundings in the river, but I utilized that data which I consider is much better.

Mr. KING. Then, having that data?

Mr. LEA. Having that data, I utilized the ordinary backwater calculation. I used the Chezy formula with Kutter's coefficient.

Mr. KING. Are those formulas supposed to be subject to correction as years go by in the same way as the table of discharges was corrected by your table this morning?

Mr. LEA. No; not in any sense.

Mr. KING. In preparing your data you spoke of the effect of a discharge section of the river being computed with regard to three elements. You did not have any regard to the natural obstructions or the shape of the river bed or of the banks in making that computation?

Mr. LEA. Yes; I did.

Mr. KING. I understood you to say you took width and velocity and cross-sectional area.

Mr. LEA. Yes; and what else did you ask about?

Mr. KING. I asked if you had any regard whatever to the contour of the river bed or banks. The shape of the section made no difference to you?

Mr. LEA. The effective factor in the shape of the section was given by the hydraulic radius, which I did obtain by that method.

Mr. KING. By the method you have outlined?

Mr. LEA. Yes.

Mr. KING. Which took no regard of the contour line of the river?

Mr. LEA. Oh, yes; it did. It took account of the contours, as you call them, of the river bed, because we took sections near enough together to take those into account, as is always done.

Mr. KING. Having regard, for instance, to your computation with regard to the so-called Hog's Back itself, did you make a study of the contour of the river bed at that point?

Mr. LEA. Yes; because that was necessary.

Mr. KING. In which of the three elements which you mentioned just now did that contour come?

Mr. LEA. Possibly in the hydraulic radius partially, and I also took it into account in the choice of what is called the coefficient of roughness, which is usually represented in this formula by the

letter N. That I obtained by the general appearance of the bed of the river by soundings and my knowledge of the whole river.

Mr. KING. I am smiling as well as you are. I quite appreciate the difficulties encountered. How did you arrive at the velocity you spoke of?

Mr. LEA. By floats and watches as described this morning.

Mr. KING. So many floats placed in different positions in the river?

Mr. LEA. Yes.

Mr. KING. Some in the middle and some along the side?

Mr. LEA. Yes; very good indeed compared with what I know is generally done.

Mr. KING. Your words "very good" measure a relative value. How many positions in the river stream would your floats take, mostly in the center?

Mr. LEA. No; they were set out so as to be evenly spaced across the river.

Mr. KING. And extending over how long a period was that investigation?

Mr. LEA. It took about 30 minutes for the floats to go from one end to the other.

Mr. MAGRATH. Were they all surface floats?

Mr. LEA. You might call them all surface floats; yes.

Mr. KING. Was the investigation made in the spring or fall or summer?

Mr. LEA. In the fall.

Mr. KING. What was the river stage at that time?

Mr. LEA. About 210,000 second-feet.

Mr. KING. That would be lower than the stage that you referred to this morning as 222,000?

Mr. LEA. Yes; it would be lower. The velocities would be really higher at that stage than at the stage we took.

Mr. KING. I suppose it is quite possible in making these computations, having regard to the number of elements that must be considered, different engineers might arrive at different results?

Mr. LEA. In that particular method; but I took all the means that were available to eliminate the errors that are inherent in that computation.

Mr. KING. No doubt. Now, you mentioned a third method, did you not?

Mr. LEA. Yes; the third method is a good one.

Mr. KING. Will you let us have that?

Mr. LEA. It eliminates all those factors I have been talking about except the height of the river. In the Rapide Plat we established about 10 or 12 gauges from which we obtained discharge curves, just as we do from the canal gauges, and the result of having those gauges in the rapids and having them read them over a considerable period enables us to eliminate altogether the necessity for the actual determination of the condition of the bottom, or its area, or its hydraulic radius.

Mr. KING. They did not allow you to arrive directly at the effect of the proposed embankment while the embankment is not there? You suggest that you have eliminated a great number of difficulties.

Mr. LEA. I have eliminated practically all of the difficulties in calculating backwater.

Mr. KING. But you still have to use certain tables to work out the effect of the embankment?

Mr. LEA. No; I have not.

Mr. KING. Then, how did you apply to these investigations with the gauges the conditions that will arise when the embankment is there?

Mr. LEA. The conditions that will arise when the embankment is there, so far as these computations are concerned, are simply the increase or decrease of water flowing in the different parts of the river, and nothing else.

Mr. KING. In other words, the restriction in flow at Canada Island by reason of the building of the embankment is going to have a definite backwater effect which can be figured out from different tables?

Mr. LEA. It can be figured out with no tables at all by the results of those gauge readings.

Mr. KING. How closely did your three methods tally?

Mr. LEA. They tallied within about two and a half to three-tenths of a foot. I consider them very close.

Mr. KING. And for all stages of the river?

Mr. LEA. That is what I mean; all stages of the river that we investigated for backwater. For instance, I did not investigate all stages for backwater at the Hogs Back.

Mr. KING. How far up the river was the backwater likely to extend?

Mr. LEA. The backwater was likely to extend about a mile beyond the Hogs Back, so far as present levels are concerned. What I mean by that is that under the condition referred to as the 220,000, in round numbers, the limiting condition, there is a present level of the water which corresponds to that flow, and the backwater created by that embankment increases that level up the river about a mile beyond the Hogs Back. That might be three-quarters of a mile to a mile and a half, according to whether the increase is 3 inches or 6 inches.

Mr. KING. Not as far as the head of the canal?

Mr. LEA. The head of the canal is about a mile and a quarter from the Hog's Back.

Mr. KING. All the effect would disappear somewhat below?

Mr. LEA. I think the effect of that backwater would disappear below the position of Lock 24.

Mr. KING. You suggest as one advantage to be derived from the building of the embankment the elimination of a dangerous current now flowing between Ogden Island and Canada Island. I think you used the expression that the space of water between Canada Island and Ogden Island was known as the "graveyard."

Mr. LEA. No; I did not.

Mr. VAN KENNEN. I used that term.

Mr. KING. Mr. Lea, do you know of any boats that have gone on that particular dangerous spot?

Mr. LEA. I have seen four on at once.

Mr. KING. They were a tow, were they not?

Mr. LEA. I do not know. They were there when I saw them.

Mr. KING. Three of them were wrecking boats, were they not?

Mr. LEA. I do not think so. I think two of them were aground.

Mr. KING. Can you contradict this statement: That any boat that has gone on at that point between Ogden Island and Canada Island has gone on because of difficulties which she might have encountered in any section of the river, such as damaged steering gear, loss of engine power, a broken towline, or something of that kind? Can you contradict that statement?

Mr. LEA. I do not think so. I do not see why I should contradict a statement of that kind.

Mr. KING. In other words, so far as you know, boats that have gone on there may have gone on because of some of these difficulties not due to the local situation?

Mr. LEA. I do not think so.

Mr. KING. You are thinking, but you do not know, do you, Mr. Lea?

Mr. LEA. I know this much, that the steering gear might go wrong in that current and the boat would not go ashore.

Mr. KING. Where would she go ashore, below?

Mr. LEA. Perhaps not. If her steering gear breaks down and there is a side draft there, what else is there for her to do except to go ashore, and if the side draft were eliminated that influence, at least, would not be there.

Mr. KING. Have you made any investigation of the passage of boats up and down the river, Mr. Lea, as well as investigation of floats which you placed in the river itself?

Mr. LEA. In what way?

Mr. KING. Can you tell me how a course of these floats would compart with the course taken by a boat going downstream?

Mr. LEA. Well, they went down the river in five and seven different places. They must have followed the course of some of the boats.

Mr. KING. The floats went out without any motive power?

Mr. LEA. They did.

Mr. KING. They could not select their channel in any way?

Mr. LEA. No; the channel would probably be selected by the river itself.

Mr. KING. Upbound, can you tell me how fast one of the rapids steamers of the Canada Steamship Lines would pass Canada Island, going by the land, we will say; that is, under existing conditions?

Mr. LEA. No; I could not. She would probably select her eddies, and I do not know how fast she would go.

Mr. KING. You have an idea what margin of speed she has to work on over a current of the river?

Mr. LEA. Nothing except by comparison of the other stretches which she is able to negotiate farther on.

Mr. KING. Probably you refer to the stretches in the Hog's Back?

Mr. LEA. Yes; and from that west; in the swifter part of the river.

Mr. KING. Can you tell me what part of the river the steamer would take going up over the Hog's Back?

Mr. LEA. My opinion would not be worth anything on that. There are pilots here who know.

Mr. KING. But you have expressed this opinion that the increase in the velocity of the stream passing north of Canada Island will not

bring that velocity to an amount greater than is now contended with in the Rapide Plat.

Mr. LEA. Yes.

Mr. KING. Now, that surely involves some knowledge of the velocity which the steamer does experience in the Rapide Plat, or you would not make that statement.

Mr. LEA. Well, I know what she encounters; yes. I know what some of the channel velocities are in both places.

Mr. KING. Is it not a fact that the figure given to the commission this morning as to the velocity in the Rapide Plat, against which a steamer must contend, was the main stream velocity?

Mr. LEA. No, sir.

Mr. KING. What was it?

Mr. LEA. It was the average or the surface, if you please. The relations are about the same. In that stretch of 5,800 feet which includes fairly slack water as well as swift water, we got velocities over the whole course of 14 and 16 feet per second in the present river at a low stage. Those figures have to be compared with the velocities which are given in that diagram which is filed of the velocities on the north side of Canada Island.

Mr. KING. The figures which you gave the commission this morning as representing relative velocities north of Canada Island and the Rapide Plat, with which the steamer would have to contend upbound, were not based upon computations of velocities in the eddies, so called?

Mr. LEA. No; that could not be done very well.

Mr. KING. And I suppose you are aware that the steamer does take the eddies upbound?

Mr. LEA. She takes them where she can get them, but she can not get them all the way up.

Mr. KING. Is it not a fact that she crosses the stream and takes the eddies on the other side?

Mr. LEA. Yes.

Mr. KING. And in subjecting herself to the full stream velocity she may possibly go downstream to some extent?

Mr. LEA. Yes; that is possible.

Mr. KING. If the eddies were eliminated and she had to take the full force of the current that you speak of and had not an ordinary speed of her own greater than that, she could not get upstream?

Mr. LEA. I do not know about that. The speed near the shore is not nearly so great as the speed in the middle of the channel.

Mr. KING. Well, perhaps that is as far as you can go, Mr. Lea. You told us that taking a stage of 222,000 cubic feet per second the present average velocity north of Canada Island would be 6.3 feet and the velocity under the new conditions would be over 9 feet. That means that you would add about half to the existing velocity at that stage?

Mr. LEA. At that stage; yes.

Mr. KING. Supposing the stage is higher and runs up to 300,000; would you please give me the two velocities downstream?

Mr. LEA. Do you mean 320,000 as it is at present and about 30,000 less than that as it will be in the future?

Mr. KING. No. Now, let us get that straight. You told us this morning that it would be for us a critical stage of 220,000 flow. The two figures now and afterwards would be 6.3 and over 9 feet.

Mr. LEA. That is right.

Mr. KING. Now, will you give us the same comparative figures for the velocity at a stage of 300,000 instead of the 220,000 feet?

Mr. LEA. It would be about 6.8 for the lower one and about 10.7 for the other one.

Mr. KING. In other words, there is a greater divergence between the two velocities as the stage of the river increases?

Mr. LEA. Yes, sir.

Mr. MAGRATH. What would that difference mean per mile in percentages?

Mr. LEA. In one case we are increasing it about 50 per cent. In the other case it would be over 60 per cent.

Mr. KING. And the figures you gave me of 10.7, changing that into miles per hour, would be about 7 miles per hour?

Mr. LEA. Yes.

Mr. MIGNAULT. What is the average speed through the water of the ships that go up that channel?

Mr. KING. I can give you that from witnesses I have here, Mr. Mignault. I understand one of our boats can make 13.

Mr. MIGNAULT. Assuming there were no current at all going through the water, they would go at what speed?

Mr. KING. They feel that they can make safely about 13, and upbound at this point I can show that we have not got more than 2.

Mr. LEA. I wish to explain the last answer again, Mr. King. That diagram that was filed showing the velocity under present conditions and with the proposed embankment does not contemplate the abstraction of the 27,000 second-feet through the Little River.

Mr. KING. Although your various other diagrams did?

Mr. LEA. But this, you will see by the form of the diagram, was taken out of a former report.

Mr. MIGNAULT. Please state what diagram you are referring to.

Mr. LEA. It is Exhibit A–28.

Mr. KING. May I ask, Mr. Lea, why you would prepare a diagram of this kind for introduction in evidence when you had taken into account the withdrawal south of Ogden Island in your other diagrams?

Mr. LEA. As a matter of fact, this was not intended to be presented when it was prepared a year ago, when we had no idea of taking 30,000 second-feet or any other definite amount through the Little River channel. It was simply a diagram showing 1917 conditions, as is stated in the title to the diagram.

Mr. KING. Is it in any way based upon the new table of St. Lawrence discharges that you presented to the commission this morning?

Mr. LEA. The discharge scale along the bottom is, of course, according to the present revised table of discharges, the correct one.

Mr. KING. Do you mean to say that you prepared this curve with regard to the present corrected table of discharges?

Mr. LEA. The table that I filed, which is the table which has been referred to in my evidence all the way through.

Mr. KING. Are all your curves and diagrams prepared with reference to that table of corrected discharges, Exhibit A–25?

Mr. LEA. Wherever discharge is entered or appears on any diagram that we have filed it refers to the discharge of the St. Lawrence River according to our new equation of discharge.

Mr. KING. According to corrected computations?

Mr. LEA. No; but according to corrected observations which were made by the United States Lake Survey with great care and have been checked by the engineers of the Dominion Government also with great care.

Mr. KING. Have you any data upon which you can give reliable evidence to the commission as to the comparative velocity north of Canada Island if you take into account the withdrawal south of Ogden Island?

Mr. LEA. There would be 30,000 second-feet less going down there.

Mr. KING. You have not made the computations?

Mr. LEA. No. As it stands it was so much less than the other that, as a matter of fact, I did not make any computation.

Mr. KING. I do not suggest that there was any intention to mislead the commission. I simply wanted to bring out the facts.

Mr. KEEFER. Mr. Lea, my idea was to get you engineers together and then after you agreed or disagreed ask you a few questions, but I was listening to your statement about the critical stage, which I think you put at 225,000?

Mr. LEA. No; 222,500 cubic feet per second.

Mr. KEEFER. And that gives you 16.2 feet on the sill?

Mr. LEA. 16.1 feet, I think, about that, on the sill of Lock 28 and nearly the same on Lock 24.

Mr. KEEFER. Now, we have had low water to 190,000 cubic feet per second, as I understand it?

Mr. LEA. Not in the navigation season, as I understand it.

Mr. KEEFER. Well, I believe that is a fact. Supposing you do have water at 190,000; what would that give on the sill with the ordinary flow without altering conditions? It would give about 13.8, would it not?

Mr. LEA. I think it would give 14.14 at Lock 24.

Mr. KEEFER. Well, we will take the figure 14.14 at Lock 24; that is, on the basis of 190,000.

Mr. LEA. On the basis of 190,000 and nothing done.

Mr. KEEFER. Supposing you are going to take, say, 30,000 cubic feet per second flow that you say you desire in the Little River; according to your chart you would draw away how much, Mr. Lea—13,500, would you not?

Mr. LEA. Yes.

Mr. KEEFER. That 13,500 would be taken out of the river after you had only a depth at the lock of 14.14. What would that reduce the water level on that lock?

Mr. LEA. I do not know.

Mr. KEEFER. Well, is not that rather a serious matter? Should there not be some compensation for it?

Mr. LEA. I have already figured on compensation for it. If you ask me what will be the level after our compensation works are in I will tell you.

Mr. KEEFER. Do you estimate that your compensating works down at Ogden Island would affect that situation? I want to see where your compensating works come in to affect that situation at low-water stages. I am not talking of critical stages, but low-water stages.

Mr. LEA. You mean the embankment alone, do you not?

Mr. KEEFER. Which ever way you like.

Mr. LEA. Our compensation for anything at Lock 24 is the embankment and the submerged weir.

Mr. KEEFER. The embankment is what you call Canada Island to Ogden Island, is it? That is what you mean by the word "embankment?"

Mr. LEA. Yes, sir.

Mr. KEEFER. And the submerged weir is where you waste your material in the deep water there?

Mr. LEA. Yes.

Mr. KEEFER. Now, taken one by one, will your embankment compensate for that low water at Lock 24?

Mr. LEA. No; it will not compensate for it.

Mr. KEEFER. Will your submerged weir do it?

Mr. LEA. Yes; we can make it do it.

Mr. KEEFER. In what way?

Mr. LEA. By putting it there.

Mr. KEEFER. By making it a larger structure?

Mr. LEA. Yes; smaller or larger.

Mr. KEEFER. So you figure on making that compensation by virtue of that submerged weir?

Mr. LEA. And whatever backwater effect might come from the lower embankment due to the diversion drop, as I might call it, of the water.

Mr. KEEFER. Are you able to tell me anything definitely about that now, so we can check it up?

Mr. LEA. About what?

Mr. KEEFER. Anything in addition to this submerged weir by way of compensation. It is a serious matter and we want to be safe, that is all. How would it do for you engineers to get together. This is one of the points I would like clearly cleaned up. You can take your time about it. The engineers can confer together and all agree, perhaps.

Mr. LEA. Well, I can not tell you exactly now, but I think it might be three or four tenths.

Mr. KEEFER. Probably I had better leave it for the present and resume at that point again.

Mr. VAN KENNEN. Would you state the point you would like to have a conference on; I would be very glad, of course, to have it.

Mr. KEEFER. I think it would be a good thing for the engineers to confer on everything that relates to this matter, but in particular I want to know the full effect of the compensation work at the low-water period.

Mr. VAN KENNEN. We can give you that now.

Mr. KEEFER. Then give it.

Mr. LEA. We can compensate sufficiently to allow 14½ feet on the lock sill for boats, or even more, if we are allowed to fill the river up to the necessary extent.

Mr. KEEFER. What do you call the necessary extent?

Mr. LEA. The extent that is shown on that diagram will allow boats to enter at 190,000 c. f. s.

Mr. KEEFER. We have no plan of the extent of this submerged weir to show that. What would it be?

Mr. LEA. I stated at Atlantic City that it should extend at least 500 feet up and down stream.

Mr. KEEFER. That would be, in width, 500 feet, and all the way across?

Mr. LEA. In the deepest part of the channel only, where it would be necessary to fill below a certain level.

Mr. MIGNAULT. It would be very important to have a description of these works and in the order of the commission they should be described.

Mr. KEEFER. We are working at a disadvantage here, because, supposing some order is asked for from this commission and then the plans come forward afterwards before the department of public works, they might or might not be in harmony with this evidence.

Mr. MIGNAULT. That is possible.

Mr. KEEFER. I think we should have the plans as approved of by the department of public works and then they could come for an order here.

Mr. LEA. I see your point there, but so far as the description of the work is concerned I could give it now.

Mr. KEEFER. Give it.

Mr. LEA. For instance, this submerged weir is simply dropping hard material into the deepest part of the river in order to bring it up to a certain given level, which is shown there.

Mr. TAWNEY. What is that level?

Mr. LEA. It is shown on Exhibit A–29.

Mr. MIGNAULT. Assuming you were giving a contract for the construction of the weir, how would you describe it in the specifications?

Mr. LEA. Just as I have described it now—simply.

Mr. TAWNEY. Give us the height and the width and the length you contemplate.

Mr. LEA. I can not give you the exact width. That depends on the soundings of the river, but sufficient to lift it to elevation 200.

Mr. MIGNAULT. That is very indefinite.

Mr. LEA. Two hundred is not indefinite.

Mr. MIGNAULT. Yes, it is; how could we describe it in the order?

Mr. LEA. To describe the dumping of material in the channel does not seem to me to be a very technical or difficult matter. The main point is how far up and down stream we ought to have it. It would not do to make one dump 20 feet wide in the direction of the center of the stream. It would need to be at least 500 feet in length, up and down stream, and to fill the river to that level, whatever depth is required.

Mr. KEEFER. What depth would you make that; you say it is 200; what depth would that represent?

Mr. LEA. That would mean, at ordinary low water, about 22 feet.

Mr. MIGNAULT. Over the crest of the weir?

Mr. LEA. Yes; over that shallow part which you call the crest of the weir.

Mr. KEEFER. Would that create a ripple in the water by virtue of having that sort of structure there?

Mr. LEA. Yes.

Mr. KEEFER. To what extent?

Mr. LEA. Not to a very great extent.

Mr. KEEFER. I suppose there are worse places in the St. Lawrence River, but it would create rough water there.

Mr. LEA. It would create a slight wave.

Mr. KEEFER. What about the effect below that weir, as regards the locks?

Mr. LEA. That stretch of the river is wide and comparatively deep, and swift water is a good many hundred feet down below that.

Mr. KEEFER. I think I have it from you that the whole idea of compensation is in that weir.

Mr. LEA. Yes; the compensation for Lock 24.

Mr. KEEFER. Lock 24 has been a troublesome lock to enter.

Mr. LEA. Yes; but we are going to make it better, in my opinion, by this weir by checking the velocity of the current. I am not a navigator, but I think it will.

Mr. KEEFER. I am anxious that you engineers will get together, and I think perhaps that your ideas are not very far apart.

Mr. LEA. May I go on to give a description of the embankment? It might be described as a rock fill 20 feet wide on the top, and with the slope that the material will naturally take it will be something in the vicinity of one and a half to one or less, unless we wish to make it more. It is simply an embankment at least 20 feet wide on the top.

Mr. MIGNAULT. What height above the bed of the river?

Mr. LEA. The height will be high enough to intercept the water at all stages of the river. It would probably average 15 feet in height above the bed of the river.

Mr. MIGNAULT. Leaving a clear water space of how many feet above the weir? I am trying to get your description of it.

Mr. LEA. You ask how high it would be above the water?

Mr. MIGNAULT. How many feet from the water surface at, say, a stage of 190,000 c. f. s. would the top of the weir be?

Mr. LEA. It would probably be 8 or 9 feet. We have material enough there to make it what we choose.

Mr. TAWNEY. What is the distance from Ogden Island to Canada Island?

Mr. LEA. About 2,000 feet.

Mr. TAWNEY. It would be about 2,000 feet long, 20 feet wide at the top, and varying depths, according to the bed of the river.

Mr. LEA. Yes. Of course we could make a drawing showing that.

Mr. TAWNEY. Have you made any soundings to know what its depth would be and what variations there would be in the height of the embankment?

Mr. LEA. Yes, it is shown on the exhibits with the soundings.

Mr. VAN KENNEN. That was shown by Exhibit 26.

Mr. LEA. The depth is shown in Exhibit A–26.

Mr. KEEFER. Just a moment or two on another branch of the case. The total effect in power of this desired development of 30,000 c. f. s. flow would give you about 30,000 horsepower.

Mr. LEA. Not quite so much.

Mr. KEEFER. How much?

Mr. LEA. It would depend on the way we do it.

Mr. KEEFER. It would not exceed 30,000 horsepower.

Mr. LEA. No.

Mr. KEEFER. What is the potential power development at that point in the river from shore to shore?

Mr. LEA. The whole river?

Mr. KEEFER. Not the whole river all the way down, but just at Morrisburg.

Mr. LEA. Supposing we dam the whole river?

Mr. KEEFER. Yes; canalize and dam across.

Mr. LEA. That has not been determined.

Mr. KEEFER. I am told it is 200,000 or 300,000 horsepower.

Mr. LEA. We will know that in a couple of months hence, but my present opinion is that it would be over 300,000 horsepower.

Mr. KEEFER. At all events, this would be somewhere about 300,000 horsepower.

Mr. LEA. I think it would be over 300,000.

Mr. KEEFER. I would not differ with you; that is my own idea.

Mr. MIGNAULT. At what point?

Mr. LEA. At the foot of the Rapids Plat.

Mr. KEEFER. That complete development, which would be in the neighborhood of 200,000 or 300,000 horsepower, would involve damming the river from shore to shore, and either canalizing in the center or a separate canal at the side, probably canalizing the center.

Mr. MIGNAULT. And simply using the river as a waterway.

Mr. KEEFER. That would be the ideal way to do it.

Mr. LEA. Yes; if you want to do that.

Mr. KEEFER. The site for that dam would be lower down than where you propose your proposed dam, would it not, to make the best of the situation.

Mr. LEA. My opinion to-day is that it would be somewhere in the vicinity of Canada Island; perhaps within several hundred feet of it.

Mr. KEEFER. I am speaking of the ideal development of that river, and the site for this dam.

Mr. LEA. What dam are you speaking of.

Mr. KEEFER. For the entire development.

Mr. LEA. That is right. The site can not be designated in one particular spot because it would begin where our dam is, and then it would follow down Ogden Island, and it would follow downstream in a general way to some point that has not been determined yet, so far as I know, and then it would turn over to the Canada shore.

Mr. KEEFER. That dam would, of course, be a much higher dam, relatively, than the one you are proposing to put in.

Mr. LEA. It would be some feet higher.

Mr. KEEFER. Have you filed details to show the strength of your proposed dam?

Mr. LEA. No.

Mr. KEEFER. We have not that before us at all.

Mr. LEA. No.

Mr. KEEFER. If a dam should go in at this point, it would be good engineering, looking to the future, to have it of sufficient strength to add to it.

Mr. LEA. Absolutely, to get the benefit of any extra head that would come to us.

Mr. KEEFER. Have you any idea, apart from the cost of your machinery, what expenditure it will take to put in your proposed dam. I suppose you can not say that if you have not any details of the dam.

Mr. LEA. We could give you an idea; Mr. Tucker could give that.

Mr. VAN KENNEN. I will do that.

Mr. KEEFER. We will have to have that sooner or later for the public works department.

Mr. VAN KENNEN. I will prove it by Mr. Tucker as best I can now.

Mr. LEA. You understand that in a matter of this kind, at this stage, the costs might vary according to the detail of the design, but a general idea of it could be given.

Mr. KEEFER. Are you putting this forward as a war measure, as the other application was put forward, or are you putting it forward on its merits?

Mr. VAN KENNEN. We are putting it forward with the full knowledge that if we build it at this time it will be much more expensive than otherwise.

Mr. KEEFER. Then we are not going to be stampeded by this as a war measure.

Mr. VAN KENNEN. I am only pointing out that at this time we would only have to do it at a much relatively higher cost than in ordinary times. I do not suppose we could do it at this time. Our engineer will give us the estimated cost as best he can.

Mr. KING. With reference to the low stages of the river, Mr. Lea, the question I would ask would be this: What is the low stage at Lock 24 at which the backwater effect would not be felt as far up as Hogs Back?

Mr. VAN KENNEN. Mr. King, I do not understand that there is any stage of the river when it will not come up to that.

Mr. KING. I am asking the witness, and I think he can take care of himself very well.

Mr. VAN KENNEN. Much better than I can.

Mr. KING. I have no desire at all to catch him. Is is not a fact that your backwater effect decreases as the stage of the river goes down?

Mr. LEA. Slightly, very slightly.

Mr. KING. And is not a point reached where the possible stage of the river, known from experience, is so low that your backwater effect would not go up as high as the Hogs Back?

Mr. LEA. No, sir; I do not think there is.

Mr. KING. I have seen figures showing where we are down to the low stage, such as mentioned by Mr. Keefer just now, where the backwater would not go quite so far.

Mr. LEA. Not so far as it would at the higher stage, but that it would not reach the Hogs Back at all; no.

Mr. KING. Have your computations covered all stages down to the 190,000 c. f. s.; I mean the stage corresponding?

Mr. LEA. My stage in the navigating period is one month in which the flow was 194,000 c. f. s.

Mr. KING. Suppose we get the 194,000 c. f. s. flow; how far would the backwater go?

Mr. LEA. It would not go up to the Hogs Back, but it would go far enough to let ships go down.

Mr. KING. Eliminate from the discussion whether we can get down or not; I am asking you whether the backwater would go up as far the Hogs Back?

Mr. LEA. That is what I say.

Mr. KING. And you think you add to the depth of water at Hogs Back more than would be there without your embankment.

Mr. LEA. More than would be there without our embankment?

Mr. KING. Yes; under existing conditions.

Mr. LEA. That is what I mean.

Mr. KING. You think so?

Mr. LEA. Yes.

Mr McLEAN. I understand that under certain conditions, as they are to-day, there are about 4,000 or 5,000 c. f. s. flowing through the Little River.

Mr. LEA. Ordinarily about 3,000 or 3,200 c. f. s.

Mr. McLEAN. You have estimated what you call the natural flow of the Little River in contradistinction to what is going through at the present time.

Mr. LEA. Yes.

Mr. McLEAN. What is that natural flow, as you term it?

Mr. LEA. It is given on plate 2, corresponding to various discharges of the main river. For example, if the discharge of the main river was 220,000 c. f. s. the flow down the Little River would be 22,000 c. f. s. odd. If the flow in the main river is 190,000 c. f. s. the flow down the Little River would be about 16,500 c. f. s.

Mr. McLEAN. Is there any direct relation between the flow in the main river and the amount of the flow down the Little River.

Mr. LEA. No direct.

Mr. McLEAN. Is it a fact or is it not that that plate is simply used as an illustration for purposes of comparison.

Mr. LEA. That is all; the plate could just as well have been prepared with the heights of the main river instead of flow.

Mr. McLEAN. Is not a necessary element in computing the flow down the river the gauge level at the intake of the Little River.

Mr. LEA. Yes.

Mr. McLEAN. That does not appear on plate 2.

Mr. LEA. No. That was prepared for convenience because the height would not, in my opinion, convey any particular meaning, once the flow in the river passes that stage.

Mr. McLEAN. Plate 2 simply represents the result of extrinsic computations you made, and there is no direct relation between the flow in the main river and the flow down the Little River.

Mr. LEA. That is quite right.

Mr. McLEAN. Would you describe the elements that enter into your computation of the natural flow of the Little River.

Mr. LEA. Yes. The elements that enter into our computations were the cross sections of the river itself.

Mr. McLEAN. That is the Little River?

Mr. LEA. Yes; which would give us the data for computing the flow; that is, the hydraulic radius, with the cross sections of the river and the height of the water at the entrance.

Mr. MCLEAN. Any other element.

Mr. LEA. That is all that would be obtained by observation. The other element would be to determine the choice of a factor representing the condition of the bottom of the river.

Mr. MCLEAN. Have you read levels at the intake or at the mouth of the Little River?

Mr. LEA. Levels have been read at Lock 24 with which we know the relation.

Mr. MCLEAN. That is the difference in level between the gauge and the bed of the Little River.

Mr. LEA. Yes, those have been read for probably 40 or 50 years.

Mr. MCLEAN. Does the slope of the bed of the Little River enter into it as a question in determining the flow?

Mr. LEA. The bed of the Little River can not be said to have a slope because it is at various points deeper, for instance, half-way down, than it is at the lower end. But the depths and the cross sections and so on do have an influence on the quantity of water that flows through the Little River in a state of nature.

Mr. MCLEAN. In what way did they enter into your computation.

Mr. LEA. In the usual way. That is, figuring the discharge for any given stretch of the river we have the cross-section area which gives us the velocity which we require. We have the width and the width with the cross-section area gives the hydraulic radius. We have the condition of the bottom furnished by observation and estimate from which I took "N" to be between .025 and .03 in the Kutter coefficients.

Mr. MCLEAN. What values did you assign in your computation, under the Kutter rule, for the main river?

Mr. LEA. I did not assign any in the latter method of calculation, I did not know.

Mr. MCLEAN. Is it not necessary to assign a fixed value to that coefficient—you did not use that formula in your last computation?

Mr. LEA. No; nor in the one in the backwater conditions, except the ice jam.

Mr. MCLEAN. Did you not use it in one series of computations?

Mr. LEA. I did.

Mr. MCLEAN. What value did you assign to it, then?

Mr. LEA. I am not sure; it was done several years ago. I will tell you how it was obtained. It was obtained from the computations made in connection with the Long Sault investigation which was going on at that time, and in which I had opportunities of determining what that coefficient was.

Mr. MCLEAN. You used the same coefficient?

Mr. LEA. I used the coefficients that were used in the main river between Farrants Point and Lock 21. It is the generally accepted coefficient.

Mr. MCLEAN. In your application you have asked for an additional amount of water over and above what you have deemed the natural flow, have you not?

Mr. LEA. Yes, sir.

Mr. McLEAN. And that is 5,000 c. f. s.?

Mr. LEA. That varies from nothing at all up to about 14,000 c. f. s.

Mr. McLEAN. Making the maximum flow that you ask up to 30,000 c. f. s.?

Mr. LEA. Yes.

Mr. MIGNAULT. They would have 30,000 c. f. s. but they say that they would not require over and above the natural flow.

Mr. LEA. A maximum of between 14,000 and 15,000 and at the average stages of the river scarcely any at all, and at the higher stages none.

Mr. McLEAN. Now, at a certain period, Mr. Lea, you will require to call for some of this additional water, will you not?

Mr. LEA. Yes.

Mr. McLEAN. Just as a practical question, how would you get it?

Mr. LEA. How will we get it?

Mr. McLEAN. Yes; what part of your development there will enable you to get this excess water?

Mr. LEA. Our dam is really the power house, and it will be divided into a number of bays containing hydraulic units, and when these gates are open to supply water to these wheels they might, for example, each take 1,000 c. f. s., and if there were 30 units we would be always taking 30,000 c. f. s. out of the river. In order that that water may come to us with the proper velocity, so that we will have some head left when it arrives at the wheels, we will enlarge the Little River at the required points, at the entrance and one or two points on the way downstream.

Mr. McLean. Is it not true that the practical efficient plan, assuming your illustration that you have 30 units each at 1,000 horsepower——

Mr. LEA. That was only mentioned for the sake of illustration.

Mr. McLEAN. If you must have additional head at your dam, and if you should put in 31 units, would you not be enabled to use more than your 30,000 c. f. s.?

Mr. LEA. If I understand your question aright to mean that if we make it possible to pass more than 30,000 c. f. s. at the dam that we could take it.

Mr. McLEAN. Yes.

Mr. LEA. We can take it unless we are prevented.

Mr. McLEAN. Yes. There is not anything in your forebay or intake or in the method in which the water comes down from the St. Lawrence River, that actually limits you to the 30,000 c. f. s.

Mr. LEA. There are no physical reasons.

Mr. McLEAN. And the restriction or limitation would be in the number of units that you put in at your dam.

Mr. LEA. Yes. What I might have said was this: That if we took more water we would of course lower the head available for power at the dam, and so defeat our purpose if we attempted to take more.

Mr. McLEAN. It would be impossible to so nicely adjust the use of your intake and your 30,000 c. f. s. that you would always have just sufficient head to run your units; you must allow a figure for surplus, you must allow some latitude; is not that the practical method of building your plan?

Mr. LEA. Yes. But we are asking for a maximum of 30,000 c. f. s. and if we have a margin it will be a margin below that. All we are asking approval for is to take 30,000 c. f. s.

Mr. MCLEAN. Is there anything in the physical construction of your intake, your forebay, that would limit you to that 30,000 c. f. s.?

Mr. LEA. Not necessarily in the forebay.

Mr. MCLEAN. Or in the intake?

Mr. LEA. Or in the intake; but there is in the river itself. For instance, the gauges that are there.

Mr. MCLEAN. That is extrinsic to your development.

Mr. LEA. It could be very easily seen whether we are taking more than 30,000 c. f. s. by looking at the gauges in the river.

Mr. MCLEAN. Oh, yes.

Mr. LEA. These will be placed there, of course, if the power is ever developed.

Mr. MCLEAN. But that would be a case of observation and checking it by means of gauges.

Mr. LEA. It could be done in the easiest possible way. On account of the abundance of data that has been provided by the United States engineers and our own Government engineers, we are able to detect the slightest change in the regimen of the river by means of gauges. There are many gauges in the river, and it is possible to do that much more accurately than in any river I know of.

Mr. TAWNEY. Are you figuring on a dependable flow through the Little River or a continuous flow?

Mr. LEA. A continuous flow, this time.

Mr. KEEFER. May I ask you what would happen, and how are you going to provide, in case you have to shut down your power; suppose you temporarily shut down the plants? A rush of water in the Little River would at once take place and naturally affect the level of Lock 23.

Mr. LEA. If we shut it off and did not make any provision, that would be so.

Mr. KEEFER. What provision is made?

Mr. LEA. I said something about that.

Mr. KEEFER. Give us something about that; I would like to get your idea about that.

Mr. LEA. The actual method that is going to be employed is not absolutely determined yet, but we can suggest a method which has been used in the Winnipeg River which would apply, and what is known as a water rheostat, which is a very simple thing, a matter of 15 or 18 pipes. That would cost very little and will take care of 5,000 or 6,000 kilowatts. In case the proper load goes off the machine it could be disconnected by an ordinary disconnecting switch. If the loads did go off all the machines at once, if ever such a contingency should occur, we would simply connect the machines to the water rheostats and they would go on.

Mr. KEEFER. Would you be passing the same quantity of water?

Mr. LEA. Absolutely.

Mr. KEEFER. That would be the way in which you would guard against a temporary shutting down which would affect the level below.

Mr. LEA. That would be a way.

Mr. KEEFER. I suppose there are other engineering ways?
Mr. LEA. Yes.
Mr. KEEFER. These have not been brought forward in concrete form.
Mr. LEA. All engineers know it can be done.
Mr. KEEFER. What Winnipeg plant do you refer to?
Mr. LEA. The city plant. They do not use it for that purpose.
Mr. KEEFER. It would be essential to have something of that kind.
Mr. LEA. No. I am informed that the velocities of the machines are so low under this 10 or 11 feet head that if they were allowed to run away nothing would happen.
Mr. KEEFER. You would not conceive of any occasion happening in which you would have to shut off the flow of water.
Mr. LEA. We could provide for that without any trouble.
Mr. KEEFER. In what way?
Mr. LEA. In any one of these ways.
Mr. MIGNAULT. I suppose no plans have been prepared for the power house; you can not say whether there would be any sluice gates to let off the surplus water.
Mr. LEA. There would probably be sluice gates to pass floating ice. They usually have that, but they would not use anything for the purpose Mr. Keefer speaks of.
Mr. KEEFER. The difficulty we are in here is that we have no plan, and we do not know what in the dickens we are talking about.
Mr. TAWNEY. The Government, in granting authority for this improvement, or this commission in granting approval, could impose such a condition as would necessarily enable the company to take care of just such contingencies as you are speaking of, and that could be made a condition of the order, leaving it to the company to determine the particular details. But the results has to be definitely ascertained or determined.
Mr. KEEFER. We could shorten the thing very much if we had plans.
Mr. LEA. We have plans.
Mr. VAN KENNEN. So far as our works are concerned, we have no other idea than that they will meet with the approval of this commission, and we are prepared to take the order in that way.
Mr. TAWNEY. The applicants will have to comply with any condition that is laid down by either Government or by the commission.
Mr. VAN KENNEN. We certainly think so.
Mr. MCLEAN. I understand you to say, Mr. Lea, that outside of plate 2 there is no other computation before this commission, showing how the natural flow is arrived at; is that so?
Mr. LEA. Yes.
Mr. MIGNAULT. I understand that was left to Mr. Tucker to explain.
Mr. MCLEAN. Are you going to put Mr. Tucker in the box on that point?
Mr. VAN KENNEN. Yes. I think Mr. Lea has covered it so well that it would not be necessary, but I expect to put him in the box on that point.
Mr. MCLEAN. Very well.

Mr. MIGNAULT. That is a point I would like to be informed on as to how you estimate the natural flow. I understand it involves taking away about 1,000,000 cubic yards of material.

Mr. VAN KENNEN. I think that is so; I am not sure of the number of cubic yards, but I think you have the right idea in regard to that. Mr. Lea would like to make a reply to your suggestion.

Mr. LEA. I was not sure whether you referred to the utilization of the natural flow, or the natural flow itself.

Mr. MIGNAULT. I would like to hear it explained how you arrived at an estimate of the natural flow, because you are saying you are entitled to it. You say the river is not now in its natural condition, and you want to restore it to the condition in which it was before these obstructions were put in, before bowlders were carried down by the ice, and so on.

Mr. LEA. That million yards excavation that Mr. Mignault refers to is another matter altogether.

Mr. VAN KENNEN. Explain that.

Mr. LEA. The million yards excavation is the excavation required in the forebay in order to bring the water properly to the wheels and is the same as is going on in the forebay of the Cedar Rapids to develop it. The natural flow could go through, but it will go better when we take out more excavation. That is what the million yards refers to.

Mr. MAGRATH. If the bridge was taken out and the existing dam taken away, would natural conditions be restored?

Mr. LEA. Something approaching natural conditions would be restored, yes.

Mr. MAGRATH. What would be the difference in the flow in the Little River, as between natural conditions, as you understand them, and the conditions that would exist if the bridge and dam were taken away?

Mr. LEA. Well, that is a matter of opinion and judgment as to just exactly what was there formerly, but my opinion is that if we were to remove these artificial obstructions you speak of, that probably within 3,000 or 4,000 c. f. s. at least would go through at once.

Mr. VAN KENNEN. And increase as time went on.

Mr. LEA. And as time went on the ordinary material accumulated there would decrease naturally.

Mr. TAWNEY. That increased flow would have the effect of cleaning out this stream.

Mr. LEA. With the dam removed, the condition on the south side of Ogden Island would be very much like the other side, there would be rapids there.

Mr. MIGNAULT. Suppose the bridge and the dam were carried away by a freshet, you stated that would lower the level of the water around the north shore; have you any computation which would permit you to say what would be the extent of the lowering of the levels say at Lock 24?

Mr. LEA. I think we have. At the critical stage or ordinary low-water stage, I fancy—I don't fancy but I believe the fall would be six-tenths or seven-tenths of a foot at Lock 24—without any compensation you mean, just simply the washing away of the obstruction.

Mr. KEEFER. I have to ask you this question in order to get light on the subject and I will follow it up later. I think I understood

you to say that Lock 24 was a regulating lock, that if they could get through Lock 24 they could get through anything.

Mr. LEA. No, Lock 15.

Mr. KEEFER. Yes. that is so. To get the relations between Lock 21 and Lock 24, see if your figures are correct because they tend to show the converse. With this critical stage of water you speak of, 220,000 c. f. s. you would have 16.1 on Lock 24 would you not?

Mr. LEA. We would have about 16.

Mr. KEEFER. What would you have on Lock 21. I have it 16.1.

Mr. LEA. I do not know, but in past years before there was any diversion through the Massena Canal, we would have it somewhere about 15.2.

Mr. KEEFER. I agree with you; I accept your figures, 16.1 at Lock 24 and 15.2 at Lock 21.

Mr. LEA. Yes.

Mr. KEEFER. Take the water at 194,000 c. f. s.

Mr. LEA. Yes.

Mr. KEEFER. That would work out the reverse, as I understand it. At Lock 24, 13.9.

Mr. LEA. No, at Lock 24 it would be 14.4 very nearly.

Mr. KEEFER. I have it at 13.9. That is where our difference is and we will look that up. What would you make it at Lock 21?

Mr. LEA. About 14.

Mr. KEEFER. There is where we differ.

Mr. LEA. As a matter of fact Lock 21 is uncertain now because uncertain amounts of water have been diverted. But Lock 15 is really the governing one because it is lower than either 21 or 24.

Mr. KEEFER. Lock 21 is affected by the Massena Canal.

Mr. LEA. Yes, and Lock 15 and Lock 24 are not, and therefore the comparison is better made between Lock 15 and Lock 24, because Lock 21 is uncertain.

Mr. POWELL. How does the Massena Canal affect it?

Mr. LEA. That withdrawal of water, naturally.

Mr. KING. Does it decrease or increase the level of Lock 21?

Mr. LEA. If it is only a matter of withdrawal it lowers the level; but if it is a matter of putting in a weir and afterwards altering the channel, it may increase it. In fact it is a complicated question, so far as I am concerned. I do not know, I have too much doubt about it yet to state anything very definite.

Mr. KEEFER. It will be found out by experience.

Mr. POWELL. There has been an idea that is running through my mind—you have a head of about 10 feet after you have put in the proposed dam. Now, considering that small head, and the limited width of the river at that place, could you get in enough units to use up 30,000 horsepower?

Mr. LEA. Yes, sir.

Mr. POWELL. There would be no difficulty?

Mr. LEA. No. The only difficulty would be in getting the designers of the wheels to design them for these conditions.

Mr. POWELL. There would be no practical difficulty in the way?

Mr. LEA. No.

Mr. MCLEAN. It would seem to me proper at this time to ask that my exception be noted to the admission of plate 2 as filed, in so far

as it purports to be any evidence of what the natural flow of the Little River, at the various stages of the flow of the St. Lawrence River, as shown on the diagram. This diagram it seems is purely a pictorial illustration of the results of some extrinsic computations which are not before the commission, and I should hate to feel that we were bound to have a conclusion as to what the natural flow is, as shown on plate 2, certainly not at this time.

Mr. POWELL. Did I understand you aright there, Mr. Lea, that if you removed all the obstructions in the stream that are there to-day, the immediate consequence would be a natural flow of 3,000 c. f. s.?

Mr. LEA. No; they have about 3,000 of a present flow.

Mr. POWELL. Then it would be about 27,000.

Mr. LEA. According to the stage of the river. It might be only 10,000 at a very low stage.

Mr. VAN KENNEN. Is there anything further you want to say, Mr. Lea, with reference to these questions, in further explanation of any of them?

Mr. LEA. The only thing is in reply to Mr. McLean; that is to say, this diagram, plate 2, represents the result of computations which have been referred to and described by me in the course of this hearing, but the methods of getting the actual cross sections have not been explained by me, because they have been taken by Mr. Tucker, who will explain them, and then the information will be complete.

Mr. VAN KENNEN. Have you anything else to say on any of these points?

Mr. LEA. I think not.

Mr. MCLEAN. I ask that my objection be noted at this time. If the whole matter is connected up later, the objection will be withdrawn.

Mr. VAN KENNEN. I think we will connect it up.

Mr. LEA. That is all, then.

Mr. MAGRATH. Mr. Lea, is it your judgment that the location of this proposed dam is at the point in the Little River where you will get the maximum efficiency from the water that comes down that stream?

Mr. LEA. Yes, sir. The position that you refer to is what?

Mr. MAGRATH. Marked A on the map. You say that you are entitled to the natural flow of the Little River.

Mr. LEA. Yes.

Mr. MAGRATH. The point I want to get at is this: Taking that natural flow, are you going to get, by building your dam at A, the maximum service from that water?

Mr. LEA. We can get the full service from that water at either point A or point B, but one of them will probably turn out to be more economical than the other.

Mr. VAN KENNEN. Which do you figure as the most economical?

Mr. LEA. I think the position at A is the more economical.

Mr. VAN KENNEN. For what reason?

Mr. LEA. Because the tailrace excavation and the excavation under the power house is less at point A than farthest up.

Mr. POWELL. If you take the whole river as a unit, where, in your idea, should the development take place?

Mr. LEA. I described that generally a little while ago. The development on the American side would take place where our proposed power house is to be, for the very same reason that we are placing it there. And then, Ogden Island itself would form probably a part of the dam downstream, and then from the lower end of Ogden Island the dam or the power house, which would act as a dam, would extend farther downstream to a point to be determined later where the angle would be, and at that point would turn at right angles to the direction of the stream to the north bank.

Mr. POWELL. You would get about 2 feet more head, supposing you could get that water brought down.

Mr. LEA. We would get more than that.

Mr. POWELL. If it is physically possible to do it, would not that place be the proper place for the development where you could get 2 feet more head?

Mr. LEA. No; we would be getting 2 feet more head because we would be damming the whole river.

Mr. POWELL. That is what I mean.

Mr. LEA. If we were able to dam the whole river now, we would get more than by damming one-half of it.

Mr. POWELL. If you dam the whole river you could put a lock in there for navigation, and it would be a great aid for navigation. If you are damming the whole river there, where would you put in your development?

Mr. TAWNEY. He says they have not determined that.

Mr. POWELL. You have not data enough for that.

Mr. LEA. I do not think anyone has yet.

Mr. POWELL. The Canadian Government are putting forward the contention—I do not know that the American Government are parties to it—that working it out on the plan. In this 300,000 c. f. s., so far as your information goes, if you put it down below, would you have an increase of 6,000 feet?

Mr. LEA. No; we could get the same efficiency out of it where it is.

Mr. POWELL. How is that?

Mr. LEA. Because, Mr. Powell, the fall in this part of the river, which would form the tailrace, would be practically nothing.

Mr. POWELL. It is practically canal level there.

Mr. LEA. It is practically level there because the section is so large compared with the quantity of water which should be flowing down. You can see that the level around here varies very much.

Mr. POWELL. Looking at the Little River as a factor in this development of the whole stream, now if you put the dam across the whole river, say at Dry Island, taking it as an illustration, you would gain 2 feet more head.

Mr. LEA. No; we are going to get the level back here practically that we have at Dry Island, because the fall from Dry Island back to this part of the dam, or any other part of it, to which I have referred, the fall there would be very slight. The fall in that tailrace portion of the river would be very slight. We would not get the full head we would get down there but we would probably get within 6 inches. The objection to putting it down at Dry Island is that there would not be room.

Mr. POWELL. That idea I mentioned would not give room for your development.

Mr. LEA. No, sir.

(Mr. Lea was not further examined for the present.)

B. B. TUCKER was produced as a witness on behalf of the applicant, and after being first duly sworn, was examined and testified as follows:

Mr. VAN KENNEN. Where do you reside, Mr. Tucker?

Mr. TUCKER. In Morrisburg.

Mr. VAN KENNEN. Are you now, and have you been, an employee of the New York & Ontario Power Co.?

Mr. TUCKER. Yes, sir.

Mr. VAN KENNEN. In what capacity?

Mr. TUCKER. As resident engineer.

Mr. VAN KENNEN. I wish you would explain to the commission your qualifications as an engineer.

Mr. TUCKER. I am a graduate of Toronto University in 1905. I then went with the Sheet Steel Co. in Morrisburg, as engineer doing construction work for a year and a half. After that I was in charge of the operation. This mill was electrically equipped, and we used hydraulic power, operating our own power house during the entire period of operation. In 1908 I joined the present company, the New York & Ontario Power Co., with which company I have been since.

Mr. VAN KENNEN. You have been connected continuously in engineering work in connection with that company since that time?

Mr. TUCKER. Yes; during which time we have operated at different periods two power houses at low heads similar to the proposed development at Waddington.

Mr. MIGNAULT. Where was this operation carried on?

Mr. TUCKER. In Morrisburg and Iroquois, Ontario.

Mr. VAN KENNEN. Have you operated any part of this particular plant?

Mr. TUCKER. Yes; we operated a plant at Waddington which supplies the town of Waddington.

Mr. VAN KENNEN. Have you had entire charge of all the work connected with that?

Mr. TUCKER. I have.

Mr. VAN KENNEN. During the period of your connection with this company, have you made an investigation to determine the natural flow of the so-called Little River?

Mr. TUCKER. I have. I have had charge of practically all the field work.

Mr. VAN KENNEN. I want to introduce in evidence at this point the location of the sections of the Little River for the purpose of determining this question and then ask for the explanation. [The paper just introduced in evidence was marked "Applicant's Exhibit A–30."] Now, Mr. Tucker, will you go on and explain how you made the measurements for the purpose of determining the necessary data for the computation of the natural flow of that stream?

Mr. TUCKER. I did the field work in order to secure enough data to compute the natural flow of the stream in the usual manner; that is, I divided the Little River into, as it happened, fourteen sections,

each of them fairly uniform. In each of these sections or reaches, I selected a cross section which would be typical of that reach, and in that section I took the necessary soundings in order to determine the cross-sectional areas. These were plotted in the form of a curve. I also measured the width, and these exhibits were sent to Mr. Lee for his use. In order to determine the deposit, to find the natural state of the bed, I selected the three smallest sections, and found the deposits in those sections as near as I could. The first section was at the intake; that is, at the entrance of Little River. I found the amount of the deposit there simply by taking a steel rod, in fact, a three-eighths inch gas pipe, and pushed it down in the mud, out of the boat. The next section I tried was section No. 5, which was obtained in a similar manner. In section No. 12 it was rather difficult to find the exact bed of the stream; so I took not only the soundings as found by the rod there, but I also took into consideration the soundings in the adjacent area; that is, probably 25 feet on each side. This is the bed which I call the natural bed of the stream. The remaining 11 sections I did not bother with, because it would not make much difference.

Mr. MIGNAULT. That is to say, you made those computations in the contracted sections.

Mr. TUCKER. Yes.

Mr. MIGNAULT. You endeavored, then, to ascertain, by pushing down a rod through the mud, where the river bed was?

Mr. TUCKER. Yes.

Mr. GARDNER. What was your evidence when you thought you had reached the original bed of the river? What particular thing did you find that determined that in your mind?

Mr. TUCKER. When the rod went down a certain distance it struck either a large bowlder, or something of that sort. I am not stating that that was the natural bed, but it was at least that far down, and maybe farther.

Mr. VAN KENNEN. In making the measurements of the cross sections, how often did you make them?

Mr. TUCKER. They are made at about 25 feet 6 inches across the stream.

Mr. VAN KENNEN. When you got those figures, you submitted them to Mr. Lea, who was your consulting engineer, for his information in order to calculate the natural flow of that stream?

Mr. TUCKER. I did.

Mr. VAN KENNEN. And as a result of those figures that you made, plate No. 2 was made by Mr. Lea and yourself? Is that right?

Mr. TUCKER. That is right.

Mr. VAN KENNEN. And you took them accurately?

Mr. TUCKER. I did.

Mr. VAN KENNEN. And sent the figures that you took to him, so that the figures that he used were the exact figures as you found them.

Mr. TUCKER. Yes; as near as I know.

Mr. POWELL. This would be an alluvial deposit, I suppose?

Mr. TUCKER. Mostly.

Mr. POWELL. There was no deposit from the ice?

Mr. TUCKER. At the intake I found a few stones, probably 3 or 4 inches in diameter, and the rod probably went in between them. That would not make much difference.

Mr. POWELL. You did not form any estimate as to how long this sediment had been accumulating there?

Mr. TUCKER. No, but the intake is badly blocked with weeds. In fact, in the summer time it is quite impossible to ge through there with a motor boat.

Mr. POWELL. But you do not know how long it has been accumulating?

Mr. TUCKER. I suppose since the dam has been constructed. That is the inference.

Mr. MIGNAULT. What is the fall, say, from the intake down to the dam?

Mr. TUCKER. The whole channel is 14,000 feet long, that is, down to the opposite end of Ogden Island.

Mr. MIGNAULT. What is the total fall in that distance?

Mr. TUCKER. 11.22 feet.

Mr. MIGNAULT. Is that fall gradual, or is it more concentrated at certain places?

Mr. TUCKER. It takes place almost entirely between the upper end of the bridge and the lower side of the dam; that is, within 1,000 feet,

Mr. MIGNAULT. The fall is practically concentrated there?

Mr. TUCKER. Yes; it is practically dead water in that stream.

Mr. MIGNAULT. Have you any idea what the fall was before the construction of the dam or bridge at the intake, whether there was a strong current there? It is now dead water there?

Mr. TUCKER. Yes; it must have been very strong.

Mr. MIGNAULT. A strong current?

Mr. TUCKER. Yes; because that is a small section.

Mr. MIGNAULT. Can you say, then, what would be the fall from the intake down to the site of the bridge?

Mr. TUCKER. At the present time?

Mr. MIGNAULT. No; in a state of nature. I am referring to that.

Mr. TUCKER. No; I could not give you a profile of the water surface.

Mr. MIGNAULT. Is there any way of ascertaining it?

Mr. TUCKER. That possibly might be worked up from the computation.

Mr. MIGNAULT. What reason do you suggest for saying that there would be a strong current at the intake if the bridge and dam were not there?

Mr. TUCKER. Because that is the smallest cross section and necessarily the swiftest current.

Mr. MIGNAULT. It is not on account of any fall in the Little River.

Mr. TUCKER. On, no.

Mr. MIGNAULT. The current may have been quite slow in the Little River till it reached about the site of the dam and bridge. Then the greatest fall, you say, was concentrated between the site of the bridge and the site of the dam.

Mr. TUCKER. No, sir; at the present time the greatest fall is there.

Mr. MIGNAULT. But I mean in a state of nature.

Mr. TUCKER. No; I think the greatest fall is at the intake.

Mr. MIGNAULT. Do your studies show what is the fall of the bed of the river without any obstructions?

Mr. TUCKER. No; they do not.

Mr. POWELL. Did you make any soundings below the dam to see what the character of the bed was there?

Mr. TUCKER. Yes; about 1,200 feet below the dam the rock is quite clear. It is covered with sawdust and a little gravel, evidently from the old mills.

Mr. POWELL. Where that condition exists it is practically dead water, is it not?

Mr. TUCKER. Yes; but there have not been any deposits come in there except from the mills.

Mr. POWELL. It has been intercepted by the dam?

Mr. TUCKER. Yes. I found probably 12 inches of sawdust. It was so light you could push right through it.

Mr. VAN KENNEN. That question suggests one other that I have that I might put in here. I wish for the purpose of the record you would describe briefly the Little River and the proposed development, in length and general characteristics.

Mr. MIGNAULT. Under present conditions?

Mr. VAN KENNEN. Under present conditions, just as it exists at the present time.

Mr. TUCKER. At the head of Ogden Island the river is divided into two channels. That on the north contains the international boundary line and the Rapide Plat. That on the south is an American stream locally called Little River. About 11,000 feet from the entrance to the Little River is a roadway or bridge, which is simply a roadway or bowlders rolled into the stream, with two openings in it providing a supply of water to the dam below.

Mr. VAN KENNEN. How big are these openings?

Mr. TUCKER. One is 43 feet and the other is 25 feet. About 900 feet below the bridge is an old gravity-type dam. This is composed of cribs filled with stones, old sluices which have gone out of use and have gradually filled up with stones and débris. It connects the mainland to the island. Below that the channel is clear and joins the main channel at the foot of the island.

Mr. MAGRATH. What is the length of the island?

Mr. TUCKER. About 14 000 feet.

Mr. VAN KENNEN. I wish you would describe a little more fully the character of the bed of the stream below the site of the present dam.

Mr. TUCKER. From the soundings I have made and investigations below the dam there are from about 12 to 18 inches of sawdust and gravel at a distance of about 1,500 feet below the dam. Farther down there are deposits of mud along the shore from the cultivated fields, and the rest of it is fairly clear as if the current had swept it clean.

Mr. VAN KENNEN. I would like to have you give a little description of the character of the bed of the stream after you get down some distance below the dam, with respect to the depth of the water over the bed of the stream.

Mr. TUCKER. My investigations show that a distance from 1,500 feet below the dam down to the outlet there is a cross-sectional area

of 14,000 square feet, approximately, at low water. This is practically 14 feet deep and 1,000 feet wide.

Mr. VAN KENNEN. Do you mean that that section that you are describing now is what they call the deep-water section of the river?

Mr. TUCKER. Yes.

Mr. VAN KENNEN. Well, what is it between the deep-water section and the dam?

Mr. TUCKER. There is a rocky ledge immediately below the dam on which have been built mills at various times. They were supplied with water through the sluices in the dam.

Mr. VAN KENNEN. How far downstream does that extend?

Mr. TUCKER. That does not go straight across the stream. It is more in the course of a convex curve.

Mr. VAN KENNEN. If you follow that ledge down until you reach the end you would drop off, then, into deep water?

Mr. TUCKER. That is right.

Mr. VAN KENNEN. You have explained the dam. Now, I wish you would explain what you found with reference to the use of that in connection with navigation.

Mr. TUCKER. At the north end of the dam is to be seen at the present time the remains of an old lock which has not been used evidently for a great number of years.

Mr. TAWNEY. Is there any evidence there that would enable you to determine the size of that lock?

Mr. TUCKER. I can give you its approximate size. It is about 50 feet long, 12 feet wide, and the depth of water in the fill varies from 2 to 4 feet.

Mr. VAN KENNEN. I think you had better describe what you found on the south shore below the Little River in the way of hydraulic works.

Mr. TUCKER. On the south shore, starting at the dam, there has been built a canal, evidently partly excavated out of the shore line and the excavated material forms the north bank of that canal. Along this canal have been erected several mills which were fed from the canal. The canal was fed from the fore bay, immediately in front of the dam.

Mr. MIGNAULT. That was the power canal?

Mr. TUCKER. That was the power canal. It is probably 8 feet wide, carrying 3 or 4 feet of water.

Mr. VAN KENNEN. Are there, to your knowledge, certain mills there now that are being operated from that canal?

Mr. TUCKER. Yes; there are three or four mills there in operation.

Mr. VAN KENNEN. Were there more in the past, according to your knowledge?

Mr. TUCKER. Yes; there have been two or three shut down to my knowledge since I have been there.

Mr. VAN KENNEN. I wish you would describe to the commission the condition of that dam as to its state of repair.

Mr. TUCKER. The dam is in a very bad state of repair. In fact, I get telegrams and letters from Waddington every once in awhile, especially in high water times, stating that the dam is going out. In 1913 we put in a section, probably 50 feet long, rebuilt it, on account

of the water washing it away. In 1915 we also put in a section. There are three or four places there in very bad shape, and they are very apt to go out at any time with extra high water.

Mr. VAN KENNEN. Is there anything else that you would like to say to the commission with respect to the condition and the character of the Little River in regard to power development at that place?

Mr. TUCKER. No; I think I have covered it.

Mr. MIGNAULT. How long do you estimate that the dam can remain in its present condition without being carried away?

Mr. TUCKER. I could not tell you that, sir, because it depends upon the height of the water and the winds. If it lashes it up with high water, some of it would go away immediately.

Mr. VAN KENNEN. Might it go out at any time?

Mr. TUCKER. Yes; there are pieces of it there in very bad condition.

Mr. TAWNEY. What is the cross-sectional area of the inlet of Little River?

Mr. VAN KENNEN. We were coming to that in a moment. I will introduce that information now. I wish to introduce at this time a plat showing the area of cross section.

(The plat just introduced in evidence was marked "Applicant's Exhibit A–32.")

Will you kindly explain that, Mr. Tucker?

Mr. TUCKER. These areas were platted in this manner in order to be in convenient shape for getting them for any section at any elevation. For instance, along the base of the diagram run the numbers 4,000, 5,000, 6,000, and so forth, square feet cross-sectional area. Along the side are seen the elevations of the water surface.

Mr. VAN KENNEN. That elevation is taken at what point?

Mr. TUCKER. That elevation is taken at the section in question.

Mr. VAN KENNEN. And it means the elevation of the water above what?

Mr. TUCKER. Above the mean tide at New York.

Mr. VAN KENNEN. So it is standard so far as the elevation is concerned?

Mr. TUCKER. Yes, sir.

Mr. POWELL. Do you use the New York datum all through there?

Mr. TUCKER. Yes.

Mr. VAN KENNEN. Now, proceed with your explanation of the diagram.

Mr. TUCKER. For instance, take No. 9 on the diagram.

Mr. VAN KENNEN. Just let me interrupt you there. When you speak of No. 9 on the diagram, do you refer to Exhibit No. 31?

Mr. TUCKER. Yes.

Mr. VAN KENNEN. That is, you want to use these two diagrams together?

Mr. TUCKER. Yes.

Mr. VAN KENNEN. And No. 9 on the diagram A–31 is marked, and I should call it about midway down?

Mr. TUCKER. Yes.

Mr. VAN KENNEN. Now, take No. 9 as an illustration and go ahead and read that diagram with respect to No. 9.

Mr. TUCKER. No. 9, when the water surface is at elevation 225——

Mr. VAN KENNEN. Is that about normal?

Mr. TUCKER. That would be normal summer level, about.

Mr. VAN KENNEN. Go ahead.

Mr. TUCKER. The cross-sectional area of that would be 15,000 square feet.

Mr. VAN KENNEN. Just a minute. You say you begin by taking 225 on the side and you follow that line until you come to No. 9 on the so-called curve or lines running diagonally across here [indicating]?

Mr. MIGNAULT. That is quite evident; you need not labor that.

Mr. VAN KENNEN. No; I do not intend to do that, but I want this matter to be made clear. Then what, Mr. Tucker?

Mr. TUCKER. That is taken as the cross-sectional area of that section when the water elevation is 225.

Mr. MIGNAULT. Are these feet shown, or yards?

Mr. TUCKER. They are square feet.

Mr. TAWNEY. What do you make the number of square feet of No. 1?

Mr. TUCKER. At elevation 225 it is 5,300.

Mr. MIGNAULT. I take it that No. 9 is your widest section and No. 1 is your narrowest, and there would be that difference between the two?

Mr. TUCKER. Yes, sir.

Mr. VAN KENNEN. Is there anything further with reference to that diagram that you would like to explain?

Mr. TUCKER. No, sir.

Mr. VAN KENNEN. Did you also get the diagram showing the widths?

Mr. TUCKER. Yes; at the time I took the cross sections I also took the widths at different elevations.

Mr. VAN KENNEN. I want to introduce a table showing the surface widths of the cross sections of the Little River.

(The paper introduced in evidence was marked "Applicant's Exhibit A–33.")

Will you explain that exhibit and its connection with the natural flow?

Mr. TUCKER. I tabulated the widths for each of the sections in the form of a table shown on Exhibit A–33, which is explained as follows: At the top of the table are elevations, starting 231, 230, 229, 228, etc. Each of these are divided into tenths. At elevation 231.2 the width is 745 feet. At elevation 225.2 the width is 675 feet. I might say that these widths were tabulated in this form for convenience in making the computation and to save time.

Mr. VAN KENNEN. And, of course, these were the figures that you made from your measurements, and which were presented to Mr. Lea, in order that he might determine the natural flow of this stream.

Mr. TUCKER. Yes.

Mr. TAWNEY. Mr. Tucker, as you are familiar with it, I would like to have you explain what the conditions are at the intake or at No. 1. You spoke a moment ago of that part of the river being filled with vegetation.

Mr. TUCKER. I said there was a deposit there.

Mr. TAWNEY. I understood you to say the weeds were so thick that you could hardly get through with a motor boat. Is that a fact?

Mr. TUCKER. That is a fact in the summer time. The weeds are very thick there, which goes to prove that there is a decided deposit of mud, otherwise they would not grow.

Mr. TAWNEY. How long has that condition existed in the Little River?

Mr. VAN KENNEN. I think it was before 1808. We know that at least, because the statute of 1808 recites that there was a dam at that place. Of course, I assume that it has been repaired from time to time. Now, is there anything further, Mr. Tucker, that you would like to say with respect to Exhibit A–33 of the table of widths?

Mr. TUCKER. No; I think that fully explains it.

Mr. VAN KENNEN. Mr. Tucker, I will not go into any great detail in regard to it, but concerning the velocities of the water in the north channel, in the rapids, that Mr. Lea has testified about, those measurements were taken by you, were they?

Mr. TUCKER. They were.

Mr. VAN KENNEN. And correctly taken?

Mr. TUCKER. They were.

Mr. VAN KENNEN. And these measurements, in connection with each of these exhibits we have introduced, you have taken correctly and transcribed correctly?

Mr. TUCKER. I have.

Mr. MIGNAULT. That is to say the measurements by the floats?

Mr. TUCKER. Yes, sir.

Mr. MIGNAULT. I understood that Mr. Lea had taken some himself. I may have misunderstood him.

Mr. LEA. They were taken at my request, and a certain amount of the arrangement was made by me on the ground.

Mr. MIGNAULT. But Mr. Tucker took the actual measurements.

Mr. LEA. Mr. Tucker and some of the assistants who were stationed at various sections down the river.

Mr. TUCKER. I had a party of six or seven there.

Mr. MIGNAULT. You might describe how you made the measurements as to the velocity of the current.

Mr. TUCKER. I selected stations down along the bank of the Morrisburg Canal; that is, the south bank of the Morrisburg Canal, and at each of these sections stationed a man—sometimes a man could look after two stations—and gave him a stop watch in some cases, and in other cases an ordinary watch. Then I started off floats above the intake.

Mr. VAN KENNEN. What do you mean by the intake?

Mr. TUCKER. The intake of the Little River. I started them fairly well across the stream.

Mr. MIGNAULT. In the main channel?

Mr. TUCKER. In the main channel, allowing them to drift down with the current, and as they passed these stations the time was noted and the particular float.

Mr. MIGNAULT. Where were they placed—at what part of the stream? Were they placed in the middle of the stream?

Mr. TUCKER. I started them off fairly well distributed across the stream.

Mr. MIGNAULT. Did you notice different velocities in different parts of the stream?

Mr. TUCKER. Oh, yes. I simply took the time as they floated by the gauge readers.

Mr. MIGNAULT. The greatest velocity would be approximately in the center of the stream?

Mr. TUCKER. Well, yes. Fairly well over on the north side the velocity is higher than it is on the south side.

Mr. MIGNAULT. Down to what point did you conduct these measurements?

Mr. TUCKER. I picked them up below Lock 23. The last man was stationed at Lock 23.

Mr. MIGNAULT. You started at Lock 24 and measured down to what point?

Mr. TUCKER. Down to Lock 23. I simply took these readings and sent them to Mr. Lea.

Mr. MAGRATH. They were all surface floats?

Mr. TUCKER. Yes.

Mr. MAGRATH. Is that a correct method of obtaining the velocity, to use surface floats?

Mr. TUCKER. I started with pole floats, but the whirlpools and currents would cause them to duck, and then when they sunk it would probably come at a time when the gauge readers were reading them.

Mr. MIGNAULT. There are a lot of eddies in the river, I suppose.

Mr. TUCKER. Yes.

Mr. MIGNAULT. Did you allow for the eddies?

Mr. TUCKER. I made no allowance whatever. I simply gave the readings to Mr. Lea. If the floats got in the eddies, it shows less velocity than there really is.

Mr. POWELL. I suppose you took the mean of the whole thing?

Mr. TUCKER. Well, I sent these to Mr. Lea and he worked up the computations.

Mr. VAN KENNEN. Now, is there anything further with respect to the velocities that you desire to explain?

Mr. TUCKER. No; I think that covers it.

Mr. MAGRATH. At what portion of the depth are you supposed to obtain the correct velocity, Mr. Lea?

Mr. LEA. Well, the average velocity in an ordinary stream with straight lines is usually about six-tenths down, but in this case I know they were very nearly surface floats and I made allowance for in obtaining average velocities.

Mr. VAN KENNEN. I would like to introduce here a map showing the property which belongs to this company—that is, the water-power property.

Mr. POWELL. Well, you will have to fight that matter out with your friends from New York.

Mr. VAN KENNEN. I understand that perfectly, but I thought that this commission probably would like to have this information to show that we have come here in good faith and own the entire water power.

Mr. POWELL. What about Mr. Crapser?

Mr. VAN KENNEN. I am not going to say that he may not have some rights. I do not mean to foreclose any rights that he does

have, but if he has any at all, as I understand it, they relate to a part of the land that was granted under the act of 1886 where the legislature granted to our predecessors in title all the lands in the bed of the stream to the deep waters below, which has been described by this witness as a distance of a certain space where the deep water comes down. Now, our predecessors in title under this grant, of course, deeded the various mill owners, a section below the dam for mill purposes. They did not take it to the deep water in all cases below, and, consequently, they left, as, I will say, remnants that were granted probably from the State, and that has been acquired by Mr. Crapser, as I understand it.

Mr. MIGNAULT. There has been no litigation between your company and Mr. Crapser as to the title to this property?

Mr. VAN KENNEN. No, sir. I do not think he challenges the title to what we claim at all, but he seems to have a title to some adjacent property, which he thinks with this project we might need—that is, particularly if we put the dam lower down in the stream.

Mr. MIGNAULT. He has described in his statement in response certain properties which we could never identify without a plan. You state that these properties would be some properties outside of those on which you intend to develop the power?

Mr. VAN KENNEN. Yes; I think that is a fair statement of fact. At any rate, we do not expect to take anybody else's property.

Mr. MIGNAULT. Mr. Crapser raises the question that he is the owner of Ogden Island, and you are asking to pass on Ogden Island to construct your weir. I understand the material from the weir is dumped into the river without going on the island at all.

Mr. TUCKER. We do not have to go on the island.

Mr. MIGNAULT. He says it would raise the level of the water and do damage to Ogden Island.

Mr. VAN KENNEN. I suppose any obstruction would raise the level, and, as Mr. Lea has described, if we put in a submerged weir, there would be an elevation of the water above the point where the weir is put in, more than natural. It is true that Mr. Crapser is part owner of the island itself at that point—the riparian owner. That is an abrupt shore line. I do not know what effect it would have; it certainly would not have a very detrimental effect; it would be a mere nominal thing, it looks to me.

Mr. MIGNAULT. I think you said at the last hearing that the title of a riparian owner on the St. Lawrence would not extend to the bed of the stream.

Mr. VAN KENNEN. I think the law, as it stands to-day, is so understood. I do not know that that would apply to the Little River. I do not want to admit that it did apply to the Little River.

Mr. MIGNAULT. As to the main river, if Mr. Crapser was the owner of Ogden Island opposite the place where you intend to put the weir, your statement is that that would not carry any right to the bed of the river?

Mr. VAN KENNEN. I certainly believe that to be the law, and of course all he would have would be the shore line.

Mr. MIGNAULT. Down to high-water level?

Mr. VAN KENNEN. Yes.

(Map filed as Exhibit A–34.)

Mr. GARDNER. I have a map here that I do not think anyone else on the commission got except myself. I got it from Mr. Crapser, and I would wish you to look it over. It is not in evidence, but you might look it over and see how it corresponds with your opinion.

Mr. VAN KENNEN. Now, with respect to the dam, I should say that correctly represents the location of the dam. I should say that the section at the north end of the dam is an actual representation of the location of that section.

Mr. GARDNER. I did not present this to the commission because I expected Mr. Crapser would be here.

Mr. POWELL. Could Mr. Crapser not stop you with an injunction if he has any claim?

Mr. VAN KENNEN. We practically own all of these lands, and if we do not, we are in a position to acquire them by agreement. I do not know about this commission having authority for a condemnation.

Mr. POWELL. If it were on the Canadian side, we could do it.

Mr. VAN KENNEN. I am not sure but what you could do it on our side for a public-service corporation, but I am not sure that you could do it for a purely industrial enterprise.

Mr. MIGNAULT. I understand that in answering Mr. Gardner you were referring to a plan which is not in evidence.

Mr. VAN KENNEN. Yes. Now, Mr. Tucker, will you take the property owned by the New York & Ontario Power Co. and describe it on this map, Exhibit A–34, so that the commission will fully understand it?

Mr. TUCKER. This exhibit shows the property from a point a short distance above the bridge to a point below site A, shown in the application, plate 1.

Mr. MIGNAULT. Is the river shown on this?

Mr. TUCKER. Yes, sir. The property owned by the New York & Ontario Power Co. and controlled by it is shown by the lettering "N. Y. & O. P. Co." and in another place by the initials "W. S. C.," referring to Mr. Connolly, the president of the company.

Mr. MIGNAULT. Who has acquired title to some of this property; does that appear in the evidence?

Mr. VAN KENNEN. That appears already.

Mr. MIGNAULT. This does not show any ownership to the bed of the Little River.

Mr. VAN KENNEN. I am coming to that. If you notice in the center of that map, that is a cross section, as I understand it, of the river, and the ownership of that land was the ownership acquired by this company from its predecessors in title, through the grant to the Ogdens, and takes the bed of the stream clear across the stream at the foot of the dam. Is that right, Mr. Tucker?

Mr. TUCKER. That is right, as I understand it.

Mr. MIGNAULT. Is that the site of the bridge or of the dam?

Mr. TUCKER. That is the site of the present dam. A short distance above that, about 5 inches above on the exhibit, is shown the bridge, and on that also are the letters "N. Y. O. P."

Mr. MIGNAULT. That would show that the New York & Ontario Power Co. owns all across the section of the river.

Mr. VAN KENNEN. Just immediately below our present dam, and besides that it shows that we own other properties along the south

shore of the Little River, which Mr. Tucker can explain by this diagram.

Mr. TUCKER. And also on the north shore.

Mr. VAN KENNEN. Whenever you have in that copy on the south shore the letters "W. S. C." it is property owned by this company through its president for its benefit. Is that right?

Mr. TUCKER. Yes, sir.

Mr. MIGNAULT. You do not need to prove title by this witness; he is merely identifying property which you say is described in your title.

Mr. VAN KENNEN. That is all this evidence purports to do. What does this shaded line on the north shore of the Little River indicate?

Mr. TUCKER. The north shore shows the property with the initials "W. S. C." and that also refers to property owned by Mr. Connolly for the company.

Mr. POWELL. Held in trust by him?

Mr. TUCKER. I suppose so. The dotted line on the north shore is the right of way for the transmission line.

Mr. VAN KENNEN. Where does that transmission line run to?

Mr. TUCKER. That runs to the point of Ogden Island for the purpose of taking power across the international boundary line.

Mr. VAN KENNEN. And that is referred to in the permission granted by the President and Secretary of State which has been introduced in evidence.

Mr. TUCKER. Yes.

Mr. MIGNAULT. What permit?

Mr. VAN KENNEN. It is a permit granted by the Secretary of State of the United States and which was, of course, approved by the President of the United States, granting us the right to construct a transmission line as far as the international border line.

Mr. MIGNAULT. I remember that that was referred to in Atlantic City.

Mr. KOONCE. That was a permit from the War Department transmitted through the Secretary of State and signed by the President. The President has to sign it because it forms a physical connection between the two countries. The permit for your transmission line on the American side was granted by the Secretary of War.

Mr. MIGNAULT. Have you acquired permission for the transmission line north of the international boundary?

Mr. VAN KENNEN. I can not say as to that.

Mr. KEEFER. That should not go in as evidence.

Mr. VAN KENNEN. At any rate I think I am right in stating that there is no formal approval on the Canadian side.

Mr. MIGNAULT. What is the date of your permission by the Secretary of War?

Mr. VAN KENNEN. About a year ago. Mr. Tucker, is there any further explanation with regard to Exhibit A-34?

Mr. TUCKER. No, sir.

Mr. VAN KENNEN. Mr. Tucker, during the time you have been engaged there as engineer, have you made any estimates of the cost of construction for the proposed power plant development in connection with which we are asking this permission?

Mr. TUCKER. I have.

Mr. VAN KENNEN. You may describe briefly what your proposed development is, before you go to the matter of estimates of cost.

Mr. TUCKER. The dam will extend from the south or main shore of the island. It will be built of concrete and in this dam will be different penstocks.

Mr. VAN KENNEN. What is the width of the dam?

Mr. TUCKER. The dam will be really a power house. The back wall of the dam, containing the water, will be reinforced concrete, varying in thickness possibly up to 3 feet.

Mr. MIGNAULT. Give a description of the dam, its width, its length, its height, and its composition.

Mr. TUCKER. The dam in length for 30 units will be 30 times 31 feet, or 930 feet in length. In width, at the bottom the excavation will be about 100 feet. At the top it will be about 50 feet.

Mr. MIGNAULT. Have you any plans of the dam?

Mr. TUCKER. The cross section is on file.

Mr. VAN KENNEN. That has already been introduced in evidence.

Mr. TUCKER. This dam contains chambers for the turbines, and on top of it will be placed the superstructure and main floor to receive the generators, switching apparatus, and auxiliary machinery.

Mr. MIGNAULT. You have calculated the length of the dam and the number of units; are there any abutments connecting it with the shore?

Mr. TUCKER. The connecting abutments for it will be probably 100 feet in length.

Mr. MIGNAULT. What will be the total length of the dam?

Mr. TUCKER. Roughly speaking, about 1,100 feet.

Mr. MIGNAULT. Have you provided for any sluice gates?

Mr. TUCKER. Not at present.

Mr. MIGNAULT. The only way the water can get away is through the wheels.

Mr. TUCKER. Through the wheels; but a sluice gate could be easily added.

Mr. MAGRATH. What effect is the dam going to have upon the land above it—the shore line on each side?

Mr. TUCKER. Nothing at all, because above the present dam there is dead water.

Mr. MIGNAULT. But will it raise the water in the Little River?

Mr. TUCKER. No; nothing at all.

Mr. MIGNAULT. I mean, above its present level.

Mr. TUCKER. I do not think so.

Mr. VAN KENNEN. Have you anything further to say with respect to that?

Mr. TUCKER. I think that covers the dam and the powerhouse.

Mr. MAGRATH. So that by installing this new structure you are not going to change the level of the water immediately above the structure?

Mr. TUCKER. No; because immediately above there is not any structure of any kind, there is only a leakage of 3,000 c. f. s.

Mr. MAGRATH. Nothing will be located between your dam and Ogden Island?

Mr. TUCKER. Not at site A, but there would be at site B.

Mr. MAGRATH. The ownership of the land between A and B on both sides is in whom?

Mr. VAN KENNEN. Practically owned by us.

Mr. MAGRATH. You say "practically." I see Crapser marked on one side and Porteous on another, and Crapser appears to be on the side of the line that would be opposite the space in the river between the two dams.

Mr. TUCKER. Porteous owns a part of the land that would be flooded, and we own the riparian rights, but Crapser we do not own.

Mr. MAGRATH. And Crapser has property between that space and the two dams.

Mr. MIGNAULT. Have you any estimate of the extent of the land that would be flooded if you construct a dam at point A?

Mr. TUCKER. The banks would stop it there. It is just a matter of raising the water on the banks. It would not go back over the land any more than probably 6 or 8 feet.

Mr. MIGNAULT. What elevation above the level now would you raise the water?

Mr. TUCKER. Practically 10 feet; 11 feet is the maximum.

Mr. MIGNAULT. What is the height of the banks?

Mr. TUCKER. They are 16 or 18 feet higher than the present level.

Mr. MAGRATH. What is the length of the shore line of the land owned by Mr. Crapser opposite that space between the two dams; it seems to be about 200 feet?

Mr. TUCKER. About 200 feet.

Mr. MIGNAULT. You referred to the Crapser property on Ogden Island; on the south shore of the river, who owns that property?

Mr. TUCKER. It is owned by different persons; we own most of it.

Mr. MAGRATH. Is there any other property owned by others which would be affected?

Mr. TUCKER. Yes; they are noted on Exhibit A–34.

Mr. MIGNAULT. To what extent would that property be affected?

Mr. TUCKER. It would necessitate making an arrangement with these owners to buy them out.

Mr. MIGNAULT. I think that is important; under Article VIII of the treaty we have to provide for indemnity to any interests that may be damaged, and we would have to have some estimate of the damage.

Mr. VAN KENNEN. I think that is right, but practically we have all of it under control.

Mr. MAGRATH. Be good enough to look at your plan. Am I right in saying that the only interest on the New York State side affected between the two sites are Messrs. Dickson and J. S. Crapser?

Mr. VAN KENNEN. Mr. Dickson, I can speak for myself; that can be acquired; it is already practically acquired.

Mr. MAGRATH. Are there any others in addition to these two.

Mr. TUCKER. Ray Rutherford.

Mr. VAN KENNEN. That is the fifth piece of property west of Oak Street.

Mr. MAGRATH. Are there any others?

Mr. TUCKER. Burdick and Forbes.

Mr. MAGRATH. So that the parties interested are: Messrs. Dickson, Crapser, Rutherford, Burdick, and Forbes.

Mr. TUCKER. And J. S. Rutherford.

Mr. MIGNAULT. Where is site A on plan A–34—it is not marked here?

Mr. TUCKER. On the north side there is a space controlled by the company of 1 acre. That is the landing on the island side for the dam. Immediately opposite that would be the south abutment. I do not think there is property we do not own to the amount of more than $10,000.

Mr. MIGNAULT. You have no estimate of the extent to which this property would be affected?

Mr. TUCKER. These are all small lots.

Mr. MIGNAULT. That is not answering my question.

Mr. POWELL. Would you do anything more than raise the water on the shore?

Mr. TUCKER. That is all.

Mr. POWELL. It would not go over the top on to the soil.

Mr. MIGNAULT. He does not say on the south shore, because part of the land would be affected there; it would not be merely the banks.

Mr. TUCKER. The bank is pretty steep right there on the south shore also.

Mr. MIGNAULT. I thought there was a gentle slope down.

Mr. TUCKER. Not much. These lots are probably 80 or 100 feet from high water, up to the very high level.

Mr. MIGNAULT. The importance of this is that none of those people are here, and we have no means of determining what amount of damage they will suffer by flooding.

Mr. VAN KENNEN. I think Mr. Connolly is best acquainted with that feature of it and I can recall him on that point. I don't think Mr. Tucker has gone into that. He estimates, however, that the total value of the property does not exceed $10,000.

Mr. TUCKER. That would be it.

Mr. MIGNAULT. As a general question, the only land that would be flooded is between site A and site B.

Mr. TUCKER. That is correct.

Mr. MIGNAULT. And that is assuming that the dam and power house are constructed at site A.

Mr. TUCKER. Yes.

Mr. MIGNAULT. If it is constructed at the site B, there is no change between existing conditions and conditions as they will be after the construction of the dam?

Mr. TUCKER. No.

Mr. VAN KENNEN. Would you mind explaining, in this connection, why you consider site A more desirable for this work than site B.

Mr. MIGNAULT. I think Mr. Lea explained that; he gets a greater head there.

Mr. TUCKER. By constructing at site A instead of at site B it would save a great deal of excavation. It would mean that if we constructed at site B we would necessarily sacrifice more efficiency in the turbines in order to develop the power.

Mr. POWELL. And you get the same head?

Mr. TUCKER. We would get practically the same head, but there would be part of that head lost in the turbines.

Mr. VAN KENNEN. It is an economical proposition.

Mr. TUCKER. Yes.

Mr. MIGNAULT. Are you looking to the commission to determine which site you will use?

Mr. VAN KENNEN. I thought that the commission might give us the alternative.

Mr. MIGNAULT. I have my doubts as to whether I would agree to an order giving you an alternative.

Mr. VAN KENNEN. I do not see any reason why, but I may be wrong about that. I have no doubt that as a practical proposition we can very readily arrange to acquire any of the riparian properties and, therefore, I thought it was proper to apply for the alternative. Of course, we would have to acquire the property if we go to point B.

Mr. MIGNAULT. In my view, you should ask for either one or the other. You can not expect the commission to approve of one or the other. You may make your choice before the case is finished and amend your application. I just call your attention to that.

Mr. VAN KENNEN. I will be glad to go over that feature of it if it is necessary. I think we can bring the matter before the commission so that all the interests would be determined, and then the commission could say: Well, you can put your dam here. Now, Mr. Tucker, is there anything further you have to say with respect to this plan? Is there anything else you would like to explain with regard to the construction of the power house and the plan of the development of this power, or the character and type of the equipment necessary? What turbine do you expect to use at that place?

Mr. TUCKER. The machinery to be used is to be of the most improved design in hydroelectric work, vertical turbines, directly connected to generators. That is the general type now adopted by all hydroelectric development, where possible.

Mr. VAN KENNEN. Now, have you made an estimate of the cost at different times and in different conditions of this project? That is, including the dam, the necessary excavation of the artificial obstructions, and the other excavation, in order to permit the water to approach the dam at a proper velocity, and thereby get the highest efficiency for the natural flow, and also the equipment and hydraulic works?

Mr. POWELL. In other words, the whole undertaking.

Mr. MIGNAULT. Have you a detailed estimate, or do you want the witness to state it generally; have you prepared a statement?

Mr. TAWNEY. Could he not give it in gross?

Mr. VAN KENNEN. He could give it in gross and detail each part if you like.

Mr. TAWNEY. We are not concerned with the details.

Mr. TUCKER. I made these estimates up in 1914 and revised them on the basis for 1917. Of course, it is very difficult to arrive at the true cost in 1917, on account of the war prices, but I got this as near as possible. I got quotations where possible on the machinery, which practically is a large proportion of the expense, and the other prices I revised according to the scale of wages in the district. The total amount for 25 units, which is 25,000 horsepower, would work out $2,639,000 on 1917 prices.

Mr. MAGRATH. What proportion would you knock off for 1914 prices?

Mr. TUCKER. At 1914 prices it is $1,610,000.

Mr. POWELL. What do you calculate it up to date?

Mr. VAN KENNEN. We have made no calculation on that. I do not suppose we could get a bid on any of this property to-day.

Mr. POWELL. Not until the war is over.

Mr. TAWNEY. You could not get the material to-day.

Mr. VAN KENNEN. Not if we did get a bid. They have a commission down in Washington who tell us how much money we can spend and things of that kind.

Mr. TAWNEY. They probably would not allow you to have the machinery made now.

Mr. VAN KENNEN. We have made no estimate except what has been given by Mr. Tucker.

Mr. TAWNEY. And your 1914 price was $1,610,000.

Mr. VAN KENNEN. Yes.

Mr. TAWNEY. And your 1917 price was what?

Mr. TUCKER. $2,639,000.

Mr. GARDNER. Do the figures apply to the cost at both sites?

Mr. TUCKER. These figures are for site A, for 25 units.

Mr. MIGNAULT. You have not made up a calculation for site B.

Mr. TUCKER. I have not. That is a matter of fixing the extra cost of the excavation. There are many questions involved in this estimate. That means for 25,000 horsepower, the cost per horsepower would be in 1914 $65.69, and in 1917, $107.67.

WEDNESDAY, OCTOBER 2, 1918.

Pursuant to the recess, the commission reconvened at 10 o'clock a. m.

B. B. TUCKER, who had been produced as a witness on behalf of the applicant, and who had previously testified, resumed the stand, and upon further examination testified as follows:

Mr. VAN KENNEN. I think we have concluded the direct examination of Mr. Tucker.

Mr. KING. Mr. Chairman, I am very much interested in some of the points that have been covered by Mr. Tucker, but I do not feel that it falls within my province as representing the navigation interests to cross-examine on a question touching the flow of the Little River. I think that ought to be done by Mr. Keefer with the assistance of Mr. Stewart.

Mr. MCLEAN. Mr. Tucker, I understand that you made the physical examination upon which was calculated what you call the natural flow of the Little River. Is that true?

Mr. TUCKER. Yes, sir; it is.

Mr. MCLEAN. And you have filed here a blue print, a copy of which has been offered in evidence as applicant's Exhibit A–31, which shows, as I understand it, at different points or reaches in the river across which you made your examination the depth of the water and the depth of the silt underlying the water. Is that true?

Mr. TUCKER. Yes.

Mr. McLEAN. I show you Exhibit A–31 and call your attention to the line across the intake of the Little River numbered 1, and ask you when you made your examination at that point there indicated?

Mr. TUCKER. Those soundings were taken in 1912, and I went over it again in 1917 in order to determine the silt.

Mr. McLEAN. Will you describe exactly what took place when you made your soundings at the point indicated 1?

Mr. TUCKER. Well, I laid out the section in the usual manner.

Mr. McLEAN. Just describe what you did, Mr. Tucker.

Mr. TUCKER. I took the soundings in 1912 off the ice, laid out my lines from the steel tape, and used a boring machine to bore through the ice, and then I dropped in some cases a pole where the water was not too deep and in other cases a counding line to obtain the depths.

Mr. McLEAN. That work was carried on during the winter months?

Mr. TUCKER. Yes.

Mr. McLEAN. And the entire surface of Little River was frozen?

Mr. TUCKER. Yes.

Mr. McLEAN. What kind of pole did you use?

Mr. TUCKER. A bamboo pole.

Mr. McLEAN. Now, will you describe exactly what you did?

Mr. TUCKER. The holes bored through the ice were bored with an inch and a half auger. The ice at that point was about 12 inches thick. It varied somewhat. To get the depth from the surface of the ice, I used a bamboo pole, which was marked off in feet and tenths, by simply inserting it in the hole and shoving it down until it struck bottom.

Mr. McLEAN. And you acquired the depth then?

Mr. TUCKER. Yes.

Mr. McLEAN. What did you call that—the depth of the water?

Mr. TUCKER. The depth of the water, and I had a gauge in the river to obtain the level of the river at that time.

Mr. McLEAN. Was the ice at that time flush with the surface of the water?

Mr. TUCKER. Well, slightly below.

Mr. McLEAN. Was the water below the ice or the ice above it?

Mr. TUCKER. It came up within a couple inches of the surface of the ice. Of course, I took the water.

Mr. McLEAN. Was the ice at that point at that time a smooth surface?

Mr. TUCKER. Yes.

Mr. McLEAN. There were no ice jams or anything of that kind?

Mr. TUCKER. No; that does not occur in there, because there is not any flow to bring the ice in.

Mr. McLEAN. After you registered the depth from the surface of the ice to the bottom of the river, what did you then do, if anything?

Mr. TUCKER. Not from the surface of the ice, but from the surface of the water. Do you mean in respect to the field work?

Mr. McLEAN. No. Did you do anything else?

Mr. TUCKER. Well, I measured the width across.

Mr. McLEAN. Did you do anything with respect to the deposit on the bottom?

Mr. TUCKER. Not at that time.

Mr. McLEAN. How many of these soundings did you take in 1912 across the Little River at the point indicated No. 1?

Mr. TUCKER. They were about 25 feet apart.

Mr. MCLEAN. And you made these borings through there at a distance of 25 feet apart?

Mr. TUCKER. Yes.

Mr. MCLEAN. Have you those readings of the depths that you took at that time here with you?

Mr. TUCKER. No; I have not.

Mr. MCLEAN. What did you do with them?

Mr. TUCKER. I have them in my field books in the office.

Mr. MCLEAN. What did you do with those field books?

Mr. TUCKER. I think they are still in the office.

Mr. MCLEAN. At some subsequent time did you make another examination across the mouth of the Little River at the point indicated 1 on Exhibit A–31?

Mr. TUCKER. I did.

Mr. MCLEAN. When was that examination made?

Mr. TUCKER. In 1917.

Mr. MCLEAN. Will you subscribe what you did at that time?

Mr. TUCKER. I had the location of the former section from certain points which I had taken in 1912.

Mr. MCLEAN. What were those points?

Mr. TUCKER. I set four iron stakes at a short distance away from this section, 200 feet away.

Mr. MCLEAN. On which side, the south side of the Little River or the north side?

Mr. TUCKER. There are four on the main line called Leishman's Point, and there were four placed on the island.

Mr. MCLEAN. And your measurements were based upon those iron stakes?

Mr. TUCKER. Yes.

Mr. MCLEAN. Are those iron stakes still in the ground?

Mr. TUCKER. I think so. I could not find them all. I found three out of the eight.

Mr. MCLEAN. Will you describe what you did in 1917 at the point indicated No. 1?

Mr. TUCKER. From those iron stakes I found the section formerly measured in 1912. From the shore I stretched a cable across marking on the cable distances approximately 150 feet and approximated the twenty-five's, and from a boat I sounded in order to get the deposit at these points.

Mr. MCLEAN. What did you use for sounding?

Mr. TUCKER. I used a three-eighths-inch gas pipe which was five-eighths-inch outside diameter.

Mr. MCLEAN. Were you determining the depth of the water only or something in addition to that?

Mr. TUCKER. I measured from the surface of the water down.

Mr. MCLEAN. Down to what?

Mr. TUCKER. Down as far as the pole would go.

Mr. MCLEAN. That is through the bottom?

Mr. TUCKER. Yes, sir.

Mr. MCLEAN. So that your reading was not simply the depth of the water at that time?

Mr. TUCKER. No.

Mr. McLEAN. At the time in 1912 when you took your soundings you got only the depth of the water with your bamboo pole, did you not?

Mr. TUCKER. Yes.

Mr. McLEAN. You did not push your bamboo pole down to the bottom?

Mr. TUCKER. No.

Mr. TAWNEY. Pardon me for asking a question here, Mr. McLean. Is it your purpose in going into the minute details of the way in which the witness made his examination to show that the natural flow of the Little River is greater than they have estimated it or less?

Mr. McLEAN. It is less probably, as I am informed by our engineers.

Mr. TAWNEY. I suppose it would be to the interest of New York to make it as much as possible. That is the reason I am asking the question.

Mr. McLEAN. I think it would probably be to the interest of New York to make it as small as possible. How many of these borings did you make in 1917 at this point, Mr. Tucker?

Mr. TUCKER. Well, I could not say exactly. The idea was more to get the depth of the deposit at that point.

Mr. McLEAN. Did you take them at every 25 feet?

Mr. TUCKER. Approximately that in order to get a general idea across that stream. I also took them on either side for a short distance.

Mr. McLEAN. And you took them from a boat, did you?

Mr. TUCKER. Yes.

Mr. McLEAN. Were you able to hold your boat there in one location?

Mr. TUCKER. I simply threw an anchor overboard.

Mr. McLEAN. What was the depth of the water, let us say, approximately, midway between the headlands at the point marked No. 1?

Mr. TUCKER. I found the elevation of the bottom of the stream there at about 212. It ran from 212 to 212.5.

Mr. McLEAN. Approximately, what did that mean as to the depth of the water at that point at the time you were making your soundings?

Mr. TUCKER. It ran about 12 feet 6 inches to 13 feet.

Mr. McLEAN. What depth did you find at the bed of the river of silt or deposit before you could find the point through which you could thrust your boring rod any further?

Mr. TUCKER. That varied at different points. Of course, when taking those soundings I went on both sides of that section that was laid off. I found around the sides a deposit up to 18 inches, which went to 12 inches, and finally, down to 3 or 4 inches in midstream. That seemed to be general on either side of that section for 200 or 300 feet.

Mr. McLEAN. Sloping on the side of the bank from 18 inches down to about 3 inches in the center of the channel?

Mr. TUCKER. Yes.

Mr. McLEAN. What was the character of that deposit? Did you examine it?

Mr. TUCKER. No; I could not get any course. I did not attempt to. But from feeling with the rod I am quite sure it is mud. Out farther there is gravel mixed with it.

Mr. McLEAN. Were there bowlders?

Mr. TUCKER. There were some stones on the island side. I found quite a deposit of stone 4 or 5 inches in diameter. They are mostly covered with mud.

Mr. McLEAN. Did you keep readings of these borings that you took?

Mr. TUCKER. I simply made a sketch and sketched it in.

Mr. McLEAN. Have you that sketch with you?

Mr. TUCKER. No; I have not.

Mr. McLEAN. What became of that sketch?

Mr. TUCKER. I think it is on the files. I would not be sure.

Mr. McLEAN. You made none of the computations from these soundings and borings that you took, did you? I mean the computations that have been submitted here as indicating the so-called natural flow of Little River.

Mr. TUCKER. No; Mr. Lea made those.

Mr. McLEAN. Now, this general policy that you have outlined; is that true with regard to the other points indicated on this map; that is, Nos. 2, 3, etc., down to No. 14?

Mr. TUCKER. I did not bother with the larger sections because I did not think they affected the general problem at all. I took only No. 5, I think, as the next one. That is pretty well down.

Mr. McLEAN. So in between on Exhibit A–31 there are 2, 3, and 4. What do those points represent?

Mr. TUCKER. Those are other sections I took through the ice.

Mr. McLEAN. You took those three through the ice in 1912?

Mr. TUCKER. Yes.

Mr. McLEAN. Those were merely borings?

Mr. TUCKER. Yes.

Mr. McLEAN. You took no soundings in 1917?

Mr. TUCKER. No.

Mr. McLEAN. And the next point at which you took borings was that indicated as No. 5?

Mr. TUCKER. At No. 5, yes. I would not call those borings. They were simply soundings in order to get the deposit.

Mr. McLEAN. You took those borings or soundings to get the depth of the deposit at No. 5 in 1917?

Mr. TUCKER. Yes.

Mr. McLEAN. At what point did you take any other borings or soundings?

Mr. TUCKER. At No. 12. Those were not taken in 1917. I had done considerable work in there during 1912 and 1913. That is, I averaged that as 2 feet of deposit between the roadway and the dam.

Mr. McLEAN. At No. 5 in 1917 you took the same kind of borings that you did at No. 1? Is that true?

Mr. TUCKER. Soundings; yes.

Mr. McLEAN. What did you find with respect to the deposit on the bottom of the river at No. 5?

Mr. TUCKER. One foot, approximately.

Mr. McLEAN. Along the shore?

Mr. TUCKER. Well, those were mostly stones scattered throughout the section, more mud on the shore lines.

Mr. McLEAN. How much mud on the shore lines?

Mr. TUCKER. It ran 16 inches, probably.

Mr. McLEAN. And how much toward the center of the channel?

Mr. TUCKER. Well, a little less, probably. I think it was eight or nine tenths.

Mr. McLEAN. Sloping from about 18 inches to eight or nine tenths in the center of the channel?

Mr. TUCKER. Yes; but in the center of the channel were mostly stones with mud between. The stones were not covered with mud.

Mr. McLEAN. How large were those stones?

Mr. TUCKER. Some of them ran up to, I think, about a foot in diameter.

Mr. McLEAN. Did you thrust your pole down past those stones at all?

Mr. TUCKER. Yes; I tried to get the bottom.

Mr. McLEAN. Did you not consider that those stones were the bottom?

Mr. TUCKER. The original bottom?

Mr. McLEAN. Yes.

Mr. TUCKER. No.

Mr. McLEAN. How did those stones get there?

Mr. TUCKER. They were probably carried down by the ice above. Immediately above this intake is a very large bay.

Mr. McLEAN. Do you think the stones that had been carried down by the ice above had anything to do with the dam or bridge that is in the stream at the present time?

Mr. TUCKER. Are you talking about the section in which the bridge is?

Mr. McLEAN. Let me put my question in this way: Do you believe that the dam and the bridge structure now existing across the Little River had anything to do with the bringing down of the rocks that you found in the bed of the river at the point marked 5?

Mr. TUCKER. Certainly; otherwise the current from the Little River would have carried them right through into the main river below. They could not get through when the channel below was blocked with an ice covering.

Mr. McLEAN. Have you observed in the St. Lawrence River, in the ice coming down the Little River, bowlders a foot square being carried by the ice?

Mr. TUCKER. Yes, sir.

Mr. McLEAN. Frequently?

Mr. TUCKER. Well, quite often.

Mr. McLEAN. When have you noticed them?

Mr. TUCKER. Several winters when camping.

Mr. McLEAN. Did you see any last winter?

Mr. TUCKER. No; I was not camping last winter.

Mr. McLEAN. How frequently have you seen them? Did you see any the winter before?

Mr. TUCKER. I can not tell you definitely which winter it was, but it was probably along in 1913 or 1914.

Mr. McLEAN. In how many instances?

Mr. TUCKER. I have seen them probably half a dozen times.

Mr. McLEAN. How long have you lived on the St. Lawrence River?

Mr. TUCKER. Since 1905.

Mr. MIGNAULT. Did the ice have a jam at the entrance to the Little River?

Mr. TUCKER. Not that I know of, sir.

Mr. MIGNAULT. It flowed down freely when the ice began to melt by the Little River just as it did by the north channel?

Mr. TUCKER. That ice covering gradually melts out.

Mr. POWELL. It is stayed by the dam; it is prevented from going through?

Mr. TUCKER. Yes.

Mr. MIGNAULT. Did not the ice rather rot and melt and where it was dead did it not come down from the upper river?

Mr. TUCKER. It melted where it was, and with the raise in water the ice was lifted from the bays and with a favorable wind that flow would come downstream.

Mr. MIGNAULT. By what channel?

Mr. TUCKER. By the main river. With a north wind that bay would be caused to flow into the Little River which had melted out, and that ice not being able to get away would melt there and deposit the stones.

Mr. MIGNAULT. Did much ice go down by the Little River as a rule?

Mr. TUCKER. Well, I do not live there and I have not been there when it went out. I could not say positively, but it is quite possible.

Mr. McLEAN. Mr. Tucker, what did you do with respect to your examination at point 12?

Mr. TUCKER. I simply sounded it through there with a boat. It was very hard to determine at that point what the deposit was.

Mr. POWELL. It strikes me, Mr. McLean, that the controlling section is the narrow section above.

Mr. McLEAN. I thought it might be material simply to show exactly the facts connected with this examination. I shall not go into this at any length. I shall just ask Mr. Tucker to state, if he will, just what he did there.

Mr. TUCKER. That is the result of working with the pole from a boat.

Mr. McLEAN. What kind of a pole?

Mr. TUCKER. At one time I had a steel pole half an inch in diameter and at another time an ordinary pipe pole. My idea was to get the general deposit throughout that section; I mean the stretch between the bridge and the drawbridge. It is very difficult to determine that.

Mr. McLEAN. As an engineer, are you willing to base any exact figures on your observations taken at point 12?

Mr. TUCKER. My opinion is, from the observations I have made, that the area indicated on the exhibit is correct at that point and at other points.

Mr. McLEAN. Did you at any time that you made an examination there take readings which you reduced to writing and put in your field notes at point 12?

Mr. TUCKER. I think possibly I have some, but it is more of a general opinion.

Mr. McLEAN. Do you remember whether or not you ever submitted to Mr. Lea any readings taken at point 12?

Mr. TUCKER. Yes; I think I did, just in a general way.

Mr. McLEAN. From your observation, Mr. Tucker, what is the flow of the current as it at present exists through the Little River in miles per hour?

Mr. TUCKER. I could not say.

Mr. McLEAN. Two miles an hour?

Mr. TUCKER. No. It runs a quarter of a foot a second, I guess The width of some of those sections is 1,500 feet.

Mr. McLEAN. So that the waters are almost still, are they not?

Mr. TUCKER. Yes; practically still.

Mr. McLEAN. And at the mouth of the intake the waters are almost still, are they not?

Mr. TUCKER. There is a little drift current there.

Mr. McLEAN. But very slight?

Mr. TUCKER. Very slight.

Mr. McLEAN. Does the St. Lawrence River, the main channel, freeze over before this Little River freezes over?

Mr. TUCKER. The main channel of the St. Lawrence River never freezes over.

Mr. McLEAN. So that the Little River freezes over first?

Mr. TUCKER. Yes; but, of course, there is border ice along the shore of the main stream and what we call the bays all freeze over.

Mr. McLEAN. The winters are fairly cold there, are they not?

Mr. TUCKER. Yes.

Mr. McLEAN. And the intake of the Little River is very apt to freeze over quite early in the season?

Mr. TUCKER. The intake is the last to freeze over.

Mr. McLEAN. Where does it freeze over first?

Mr. TUCKER. In the larger sections, about midway down the stream.

Mr. McLEAN. How about the section marked 3 on Exhibit A–31?

Mr. TUCKER. That freezes over fairly early. But in breaking up this ice is broken up in the spring, not only by melting, but take the section below No. 3, No. 5, that probably melts out first; and then with a wind raising the water in the St. Lawrence, the ice above is broken up and it flows down, clearing the sections above. Below that it can not very well get away; it sort of jams in because the dam prevents it.

Mr. McLEAN. But is it not a fact that the ice forming in the Little River tends to form an ice dam which turns the main drift of ice down the St. Lawrence channel?

Mr. TUCKER. That occurs during the severe cold months, yes; but the entrance to the Little River and the smaller sections below will melt out before the bays do up in the main river, so that really, the Little River is opened by the time the bay is melted out.

Mr. McLEAN. From your observation can you say that there has been a great drift of ice at any time down the Little River? Is it not a fact that the dam and the bridge block it so that in the Little River during the winter the ice forms a dam?

Mr. TUCKER. Yes; until the break-up in the spring.

Mr. McLEAN. Now, Mr. Tucker, calling your attention to the dam, will you describe the present condition of the dam with reference to any indications of buildings or structures that were erected along it?

Mr. TUCKER. Well, I have not the number of openings in the dam that would indicate the number of structures that were built below it, but downstream there are ruins of many old mills.

Mr. McLEAN. Built entirely across the stream?

Mr. TUCKER. Yes; in fact, there are the piers of an old bridge that was built across there at one time.

Mr. McLEAN. Mr. Tucker, I show you a map and ask you if that indicates, in a general way, the present condition at the dam and below the dam?

Mr. TUCKER. Well, no; hardly. This is evidently from a very old map, because at the north side of this dam there is an earth fill which is certainly not there.

Mr. McLEAN. I am referring more particularly to the islands, we will call them, below the dam.

Mr. TUCKER. Those islands are simply the ruins of old mills.

Mr. McLEAN. But does this substantially represent those islands or ruins as they stand?

Mr. TUCKER. In a general way.

Mr. McLEAN. I will offer this map as an exhibit.

(The map was marked "New York Exhibit No. 1.")

Mr. McLEAN. Mr. Tucker, I call your attention to "Exhibit New York No. 1," and to the islands shown there and marked as "A," "B," "C," "D," "E," and "F."

Mr. SPRATT. We object to your calling those islands. The witness testified that they are ruins.

Mr. McLEAN. I call your attention to the areas marked "A," "B," "C," "D," "E," "F," and "H," and ask you if you will describe what is contained on those areas, if anything, to your knowledge.

Mr. TUCKER. Those areas are for the most part gravel, stones, brick, ruins of walls, and in some parts sawdust.

Mr. McLEAN. And between those areas the water is flowing from the leakage of the dam downstream, is it not?

Mr. TUCKER. Yes, sir.

Mr. McLEAN. And those areas do, in effect, constitute islands in the channel?

Mr. TUCKER. If you are speaking of an island as land above water they do.

Mr. McLEAN. I am satisfied with the definition. I do not know whether Mr. Spratt is or not. Calling your attention, now, Mr. Tucker, to Exhibit A–31 and the line indicated as No. 13, did you make any examination at that point?

Mr. TUCKER. Yes.

Mr. McLEAN. What did you find there? First, when did you make it?

Mr. TUCKER. That was done about 1912, through the ice, and I have also gone over it in a boat several times. I did that for the purpose of getting a location for the power house.

Mr. MCLEAN. Approximately how far below is that line from the dam?

Mr. TUCKER. The line is about 1,000 feet.

Mr. MCLEAN. And you can go across that whole distance, that line, in a boat, can you?

Mr. TUCKER. Yes; there is good water there.

Mr. MCLEAN. What water did you find there?

Mr. TUCKER. It runs from 10 to 12 feet, possibly up to 14 feet, at the island side.

Mr. MCLEAN. Can you go any farther upstream with a boat than the point by the line 13?

Mr. TUCKER. Yes; on the island side you can go practically up to the old dam. There is fairly good water there.

Mr. MCLEAN. How much water is there in that channel from the point indicated as 13 up to the dam?

Mr. TUCKER. There are 7 or 8 feet. That is the old channel approaching the old lock.

Mr. MCLEAN. And the old lock as it existed was at the head of that channel, was it not?

Mr. TUCKER. Well, approximately so, yes, sir. It is always possible to get up about midstream, very close to the dam. You can come up to the point here indicated as "F."

Mr. MCLEAN. How close to the dam are you there?

Mr. TUCKER. Within a couple of hundred feet, I suppose.

Mr. MCLEAN. Now, between these areas marked "A," "B," "C," "D," "E," and "F" there are well-defined flowing streams of water to-day, are there not, where the leakage comes through the dam?

Mr. TUCKER. It is simply the leakage making its way down to lower water.

Mr. MCLEAN. And they were natural channels in the bed of the stream, were they not?

Mr. TUCKER. I think originally, before the buildings were there. It was about all the same level across.

Mr. MCLEAN. Did you ever make any examination of the bed of the stream across there where the buildings were not erected or where the ruins do not stand?

Mr. TUCKER. That is hard to get at, it is so cut up with an old bridge. There is an old bridge across there and the ruins have simply dropped downstream side.

Mr. MCLEAN. So you never did make a physical examination?

Mr. TUCKER. Oh, just in a general way.

Mr. VAN KENNEN. I would like to introduce in evidence a photograph of a boat on the shore between Canada Island and Ogden Island, the photograph being taken, as I understand it, from the Canadian shore line south.

(The photograph was marked "Exhibit A–25.")

Mr. VAN KENNEN. Mr. Tucker, will you explain that photograph and state what it represents?

Mr. TUCKER. This photograph represents two barges on the shoal between Canada Island and Ogden Island. The photograph was taken from the main shore on the Canadian side.

Mr. MIGNAULT. Did you take the photograph?
Mr. TUCKER. I did, sir.
Mr. MIGNAULT. Do you know what barge was stranded there?
Mr. TUCKER. The *Burma* and *Quebec*.
Mr. MIGNAULT. You do not know how it happened to strand there?
Mr. TUCKER. I could not say from personal knowledge, no.
Mr. MIGNAULT. Was it a barge under tow?
Mr. TUCKER. I believe so.
Mr. MIGNAULT. This barge was not the ordinary kind of barge that is towed down the river?
Mr. TUCKER. Yes.
Mr. MIGNAULT. It was not a barge that had any engine or other machinery? It could not propel itself?
Mr. TUCKER. No; it could not; it was a tow.
Mr. VAN KENNEN. As a matter of fact, for many years the boats running between Ogdensburg and Waddington ran down through the Little River, to your knowledge, did they not?
Mr. TUCKER. Yes, sir.
Mr. VAN KENNEN. And those boats were of a size and type that would carry about 8 or 9 feet of water at full load?
Mr. TUCKER. Yes.
Mr. VAN KENNEN. And for about how many years did you yourself know of their navigating that Little River?
Mr. TUCKER. I have known them to go down there for probably four or five years. It depends upon the traffic. Sometimes there is not enough traffic to warrant it.
Mr. VAN KENNEN. There is not at the present time, I understand.
Mr. TUCKER. No.
Mr. VAN KENNEN. The present site of the lock was excavated from the shore line, was it? Or was it built in midstream or in the stream itself?
Mr. TUCKER. I could not say. It is out from the shore line now.
Mr. KING. You do not propose, Mr. Tucker, to provide for a lock in the new dam?
Mr. TUCKER. We have not yet; no, sir.
Mr. KING. There is no provision for navigation up and down the Little River?
Mr. TUCKER. Nothing over what is there at the present time.
Mr. KING. You have produced one photograph of the barge *Quebec* on the bottom between Ogden Island and Canada Island. Do you know how she happened to get there?
Mr. TUCKER. No; I know nothing about that. You can get that from the pilots.
Mr. KING. You have no more photographs, have you?
Mr. VAN KENNEN. Yes; we have more, but we have not introduced them. I suppose they are the same. We know what the conditions are there and why the boats go ashore. They can not go any other place when they break. Mr. Chairman, Mr. Daly will be our next witness.

J. DALY, of Ogdensburg, N. Y., sworn.

Mr. VAN KENNEN. Where do you reside, Mr. Daly?
Mr. DALY. Ogdensburg, N. Y.

Mr. VAN KENNEN. What has been your business chiefly during your lifetime?

Mr. DALY. Tugging and dredging, my whole life.

Mr. VAN KENNEN. How long have you been engaged in that business?

Mr. DALY. About 40 years.

Mr. VAN KENNEN. And located with your headquarters at what place?

Mr. DALY. Ogdensburg, N. Y.

Mr. VAN KENNEN. How far is that, approximately, from the so-called Little River on the north channel?

Mr. DALY. About 14½ miles to the mouth of the Little River.

Mr. VAN KENNEN. During your business as a pilot and operating a tug——

Mr. DALY. Pardon me just one minute—when I gave the distance from Ogdensburg to the Little River, I took the road, but if the distance is measured by water it would be much longer.

Mr. VAN KENNEN. What would it be by water?

Mr. DALY. I would say about 17 miles.

Mr. VAN KENNEN. During the period that you were operating tugs did you have occasion to go down the north channel a good many times.

Mr. DALY. Yes, sir.

Mr. VAN KENNEN. Did you also have occasion to go upstream at that place?

Mr. DALY. Yes, sir.

Mr. VAN KENNEN. Now, in addition to the tugs that you operated down there, what else?

Mr. DALY. Tows, barges, scows.

Mr. VAN KENNEN. Tell about how long a period, would you say, that you operated tugs there carrying tows consisting of barges and dredges and so forth.

Mr. DALY. Practically the whole time that I have been in business, 40 years.

Mr. VAN KENNEN. Have you also navigated other vessels down?

Mr. DALY. Yes, sir.

Mr. VAN KENNEN. What kind of vessels?

Mr. DALY. Steamboats, passenger boats, tugs.

Mr. VAN KENNEN. Are you familiar with what we call the full canal draft now?

Mr. DALY. Yes, sir.

Mr. VAN KENNEN. How many feet will it carry?

Mr. DALY. Fourteen feet.

Mr. VAN KENNEN. And so far as concerns the vessels that you have navigated down that stream, the barges in tow, and the tugs, what size barges and vessels have you navigated?

Mr. DALY. Do you mean in draft? It is 14 feet.

Mr. VAN KENNEN. Fourteen feet.

Mr. MIGNAULT. Have you a captain's certificate?

Mr. DALY. Yes.

Mr. VAN KENNEN. You had to have a certificate during all this period of time.

Mr. DALY. Well, no; I ran a tug before I was old enough to have a certificate; I had to wait until I was old enough to get one.

Mr. VAN KENNEN. Then you actually navigated prior to the time you were of sufficient age to get a license?

Mr. DALY. Yes, sir.

Mr. VAN KENNEN. The vessels which you have navigated down the north channel were also carrying what depth?

Mr. DALY. Fourteen feet.

Mr. VAN KENNEN. In what kind of business were these vessels generally engaged?

Mr. DALY. Practically coal.

Mr. VAN KENNEN. Were they what we generally know as full-sized canal vessels?

Mr. DALY. Yes, sir.

Mr. VAN KENNEN. And, captain, what do you say about the capacity of these full-sized canal vessels and coal barges in tonnage?

Mr. DALY. It varies; some of them 1,000, 1,200, 1,400, 1,500; 1,500 would be the maximum.

Mr. VAN KENNEN. In your operation of these vessels downstream you would go through the north channel?

Mr. DALY. Yes, sir.

Mr. VAN KENNEN. There is a canal adjacent to that on the Canadian side?

Mr. DALY. Yes, sir.

Mr. VAN KENNEN. What is the name of that canal?

Mr. DALY. The Morrisburg Canal.

Mr. VAN KENNEN. What is the next one you come to after you get out of that?

Mr. DALY. Farran's Point, and then comes Cornwall.

Mr. VAN KENNEN. Have you navigated all these canals?

Mr. DALY. Yes, sir.

Mr. VAN KENNEN. And you are familiar with all the peculiarities of them?

Mr. DALY. Yes, sir.

Mr. VAN KENNEN. What is the usual practice of navigators of freight vessels, tugs, and the tows and freight vessels in getting down this north channel? Do they take the canal or do they go by the channel?

Mr. DALY. Do you mean the method of going down the river?

Mr. VAN KENNEN. What is the practice and what has been the practice with reference to freight vessels going up stream and down?

Mr. DALY. They take the canals.

Mr. VAN KENNEN. What do you know about the extent, if any, of the upstream traffic, the freight vessels and tows through the channel of Rapids Plat?

Mr. DALY. There are very few boats that go through there outside of the Richelieu Company's boats and tugs occasionally and small fast boats.

Mr. MIGNAULT. You are referring to upstream navigation?

Mr. DALY. Yes.

Mr. VAN KENNEN. Have you navigated tugs upstream?

Mr. DALY. Yes, sir.

Mr. VAN KENNEN. You say small vessels; you mean motor boats?

Mr. DALY. Motor boats and small passenger boats.

Mr. VAN KENNEN. So that, generally speaking, aside from the Richelieu boats there is no upstream traffic through the north channel?

Mr. DALY. Practically none.

Mr. VAN KENNEN. You, of course, in your work are entirely familiar with the channel—that is, the vessel channel?

Mr. DALY. Yes, sir.

Mr. VAN KENNEN. Can you describe in some detail to this commission the course which you would follow while navigating a tow, in the first place, down that north channel of the Rapids Plat?

Mr. DALY. Yes, sir.

Mr. VAN KENNEN. Will you describe it? I wish you to look at plate No. 1, Exhibit A–17, which is in evidence.

(The witness looked at the map.)

Mr. POWELL. Now you are coming downstream with your vessel above the island?

Mr. DALY. Yes.

Mr. POWELL. Tell us what you would do.

Mr. VAN KENNEN. Describe the course with reference to that international line marked on the map.

Mr. DALY. We enter the north channel at the head of Ogden Island. We pull down not quite in line with the international line to about the first angle indicated on this map. Then we proceed along to the northward of that line down to the second angle in the international boundary line marked on the map. That second station marked there is what we call, in steamboat language, the Boilers, and we swing around there, and when you take that swing—understand, now, we have a tow of barges, you see—when we make that turn at the Boilers the tug holds in well to the Boilers; the tow naturally swings around to the northward toward the canal bank. The tug, immediately that she rounds the Boilers, has to pull over toward Ogden Island in order to straighten her tow out, so when she gets down near——

Mr. VAN KENNEN. You are speaking of the angle at the point marked on this map at approximately the letter "L" in the word "Channel"?

Mr. DALY. Yes; which we call the Boilers.

Mr. VAN KENNEN. Describe what that is.

Mr. DALY. The Boilers is a shoal that makes out there into the river on the American side from the island. I want to explain one thing right here. The witnesses yesterday spoke of the Hogs Back. I never heard the expression before until yesterday. We call it the Pitch in *Rapide* Plat. The tug rounds these Boilers, making this turn at the Boilers, and she commences to pull over toward Ogden Island to straighten her tow out in order to go over this Pitch at the point where the water is deep. I may say right here that the range for that is Mill Pitch Point on the north side of the river, on the northeast corner of Ogden Island, and that has to remain open from 10 to 15 feet, as it gives you the best water going over the Pitch. Now we have straightened the tow out and are coming down to the Pitch. I want to explain at the Pitch that the tug goes over the Pitch and she drops to the southward.

Mr. VAN KENNEN. What is that?

Mr. DALY. That is a drop, and when she drops in there the barges come up on her and she stiffens her hawsers and in a great many cases it has been proved that the hawsers are broken when the tug would come out of the cellar and bring up on the towline and the barges break loose, and that has caused several wrecks down at the foot of Ogden Island, between Ogden Island and Canada Island.

Mr. VAN KENNEN. That is all shallow water?

Mr. DALY. Yes, I could recite one accident that happened there.

Mr. MIGNAULT. Go on describing your course.

Mr. DALY. We are over the Pitch now. We then make on to the American side of the river. If the tow is a heavy tow of three barges, which is about the maximum tow they take down, it is mostly two, they commence and they pull over toward the Canadian shore again, in order to get their tow over, so that the draft here at the foot of Ogden Island and between Canada Island would not pull them in there. So they pull over there in order to get a straight passage down between Canada Island and the Canadian shore.

Mr. VAN KENNEN. What effect would it have if after you got over the Pitch you still followed down in the same course along the shore of Ogden Island?

Mr. DALY. Well, you would have a very hard pull, and unless you had a very light tow you would be drawn over between the foot of Ogden Island and Canada Island.

Mr. VAN KENNEN. Now you have described the course with a tow and in your description you have spoken of one accident which to your knowledge occurred at that point.

Mr. DALY. Right at the Pitch.

Mr. VAN KENNEN. What happened?

Mr. DALY. The tug *Seymour* in 1909 was going down with three barges and she went into the Pitch and the barges had a bad swing on her.

Mr. VAN KENNEN. What do you mean by that?

Mr. DALY. To swing around from the Boilers, and he did not get her straightened out, and he went into the Pitch without any tow hanging on to his stern and the tug went into the cellar. The slack came on the line and the barges came up on her. The tug got out of the cellar and she brought up on the hawser. She parted the first hawser and the scows brought up on the second one and parted that. The three barges came down to the foot of Ogden Island, the barge *H. B.* being one of the barges in tow. She parted from the other two, just at the head of Canada Island, swung around there, and the tug got her and put her into Morrisburg inside of the pier, and she finally sank there. The other two barges, the barges *Buckley* and *Scotland*, were alongside of each other and they laid on the rocks between Ogden Island and Canada Island.

Mr. POWELL. What is the depth of water through that passage?

Mr. DALY. I do not know that I would be safe in saying.

Mr. VAN KENNEN. I think it is practically safe to say it averages 5 or 6 feet. I do not think it is more than that on the average. The survey will show exactly.

Mr. KING. It is not intended to be navigable.

Mr. VAN KENNEN. Now, captain, while you are speaking about that, what other experiences have you known of and encountered

yourself with respect to navigating that and the danger of going on those rocks between Ogden Island and Canada Island?

Mr. DALY. Well, it is always the dread of every man who goes down there with a tow, and he gives that passage as wide a berth as he possibly can.

Mr. VAN KENNEN. Now, captain, I will ask you this: As a navigator, you speak of the cellar, and the particular accident that you refer to you say was due to the fact that the tug in navigating that course went into the cellar, which, as you would say, loosened the towline, and that after the tug got out of the cellar the strain came on the towline——

Mr. DALY. Came up with a jerk on the towline.

Mr. VAN KENNEN. And caused the parting of the line.

Mr. DALY. Yes, sir.

Mr. VAN KENNEN. Now, if the cellar that you speak of was eliminated by backwater effect or the closing of this passage——

Mr. KING. I object to the question, with all deference.

Mr. VAN KENNEN. Let me finish it.

Mr. KING. Nobody has suggested, as yet, that the cellar would be eliminated.

Mr. VAN KENNEN. I think so.

Mr. KING. No. It has been suggested that we might get 3 or 4 inches there, but there is no suggestion as to the elimination of the cellar. The word "cellar" was not used.

Mr. VAN KENNEN. If we have 5 or 6 inches over Hog's Back, we certainly are going to drown out the cellar.

Mr. KING. That is argument; there is no evidence in support of it.

Mr. VAN KENNEN. It is not argument, it is common sense. I want to finish the question. I am not asking anything that I do not think is pertinent. Now, to flood out what you call the cellar, by raising the water over the pitch on the Hog's Back, would that effect, in your opinion as a navigator, come about?

Mr. DALY. It looks very practical.

Mr. VAN KENNEN. What I mean is, would you have that jerk on your towline?

Mr. DALY. No, sir; you would not have it at all.

Mr. VAN KENNEN. In other words, you would eliminate the hazard of navigation at that point.

Mr. DALY. Certainly.

Mr. MIGNAULT. Don't lead him too much.

Mr. VAN KENNEN. I want to get the evidence, that is all.

Mr. MIGNAULT. Try and get it without leading him.

Mr. TAWNEY. He is an intelligent witness; he does not need to be led.

Mr. VAN KENNEN. I think the criticism is perfectly proper and I am trying to avoid it; but I want to get the results as briefly as possible. You now have described the course of navigation by tug and tow down the stream?

Mr. DALY. Yes, sir.

Mr. VAN KENNEN. Will you describe the course of navigating a vessel downstream.

Mr. DALY. It would be practically on the same lines but probably you would not have to pull in under the Boilers as quick a turn as

you would with a tow. But in other lines the same rule would follow practically the rest of the way down the river.

Mr. VAN KENNEN. How about a vessel going over the Pitch?

Mr. DALY. Well, with the backwater there and the elimination of the cellar it would relieve a great many boats that head over the Pitch.

Mr. VAN KENNEN. Why?

Mr. DALY. When a large freight steamer gets on top of the Pitch she naturally breaks down at the bow into the cellar. The backwater level would come up there and eliminate the cellar and the boat goes right along straight. When she breaks over there it is nine times out of ten that is the time she strikes the bottom, the bow going down into the cellar, in other words, breaking over.

Mr. VAN KENNEN. Do I understand when the bow goes down it would raise the stern and then when she comes up again it would lower the stern?

Mr. DALY. No; when the boat breaks over a Pitch like this is the time she comes down; she drops further because her bow is in the cellar and she naturally has to go further than her natural draft.

Mr. VAN KENNEN. Have you any other explanation with regard to that?

Mr. DALY. No.

Mr. VAN KENNEN. What effect would you say the side draft current would have upon the navigation of vessels; what do you have to do to overcome that?

Mr. DALY. You always have to pull over to the Canadian shore. Now, with a dike, or dam as you call it, between Ogden Island and Canada Island a boat could follow that course right down and she naturally will take the deep-water course right down through.

Mr. VAN KENNEN. Explain that.

Mr. DALY. I would point it out this way: A tow going down there, she is well over on to the Ogden side of the river, she could head on to Canada Island and with the natural draft of the current she would work right on into the regular channel between Canada Island and the north shore.

Mr. VAN KENNEN. You mean by that that if that side current were cut off you would have a more direct course?

Mr. DALY. Yes, sir; and a much easier course.

Mr. VAN KENNEN. What have you to do with reference to the upstream course; explain that, if you will?

Mr. DALY. Why, in coming up the river, you hug along the Canada Island until you get at near the point of the island, you cross out into the swift water and over along the north shore to the Canadian side. You hug that shore along.

Mr. VAN KENNEN. What do you find there as to current?

Mr. DALY. It is an eddy there. You come up to what we call Mill Pitch Point, where the letter "A" is in the word "St. Lawrence" on the map. You work to this point, you cross the river again over on to the Ogden Island side, there you get into slack water, a great many boats come up there opposite Crapser's Dock and go inside of the shoal. Crapser's Dock is indicated on the map as a point directly opposite the letter "R" in the word "rapids."

Mr. VAN KENNEN. You follow slack water up to that point?

Mr. DALY. Fairly slack water. Opposite Crapser's Dock there is a shoal. Some boats go inside of the shoal and others go outside.

Mr. VAN KENNEN. When you say inside and outside, you mean inside toward Ogden Island and outside toward Canada Island.

Mr. DALY. Yes, sir. You follow it then in under what we describe as the Boilers, and gradually keep working out into the center of the river. When you get out to the outside of the Boilers you cross over to the Canadian shore again and you follow that shore up until you get to a point nearly opposite the letter "H" in the word "north." You cross again over to Ogden Island, you run along up there till you get to the point marked "E," then you strike across again above the head of the Morrisburg Canal and follow the shore on the north side of the river practically to the west of Point-Three Point.

Mr. MIGNAULT. You never took a tow up the river?

Mr. DALY. No, sir.

Mr. VAN KENNEN. What draft tug did you take up navigating the course you describe?

Mr. DALY. An ordinary tug.

Mr. VAN KENNEN. What would it draw; what do these tugs draw?

Mr. DALY. Some of them draw 11 feet and some of them 9 feet.

Mr. VAN KENNEN. Are there any of them as deep as 14 feet?

Mr. DALY. No, we have very few tugs that are that depth.

Mr. VAN KENNEN. At all events, you refer to the largest tugs navigating on that stretch.

Mr. DALY. Yes, sir.

Mr. GARDNER. What do you mean by "slack water"; is it shoal water or still water?

Mr. DALY. It is water that runs 3 or 4 miles an hour; we call that slack water in the rapids.

Mr. VAN KENNEN. As a navigator, what is your opinion of the effect of building an embankment across from Ogden Island to Canada Island as described in plate 1?

Mr. DALY. I think it would have a wonderful effect on the river right there.

Mr. VAN KENNEN. What do you mean by "wonderful?" Good or bad?

Mr. DALY. Good.

Mr. VAN KENNNEN. Would you describe briefly just why you make that statement?

Mr. DALY. Building a dam from Ogden Island over to Canada Island is going to shut off a large area of water that passes between these two islands. Naturally that forces back the water up the channel of the river, and when Mr. Lea puts it at between four or five—I do not know whether they were inches or tenths——

Mr. VAN KENNEN. I think he got down to from 3 to 6 inches.

Mr. DALY. In my own personal opinion, I think he is very moderate when he puts it at that; I think it will go far above that. Now, I have no figures to tell that only from——

Mr. KING. Go as far as you like; don't look at me.

Mr. DALY. I did not figure this thing at all.

Mr. VAN KENNEN. If we succeed in getting an elevation of the water, what will be the effect of that on navigation?

Mr. DALY. Just what I have described. If this water backs up there and eliminates the cellar and raises the water over the Pitch, I think that is all that is necessary.

Mr. KING. This witness is not competent to speak about this.

Mr. VAN KENNEN. That is his opinion.

Mr. DALY. That is my opinion.

Mr. VAN KENNEN. What about the effect on navigation opposite Canada Island and between that and the shore going down?

Mr. DALY. I think it is a great benefit there because it gives you simply a straight channel down there, with the current running straight.

Mr. POWELL. The effect there would be to make the current much more rapid.

Mr. DALY. Naturally it would.

Mr. POWELL. That would interfere with vessels coming upstream, to a certain extent.

Mr. DALY. To a certain extent, yes.

Mr. KEEFER. In navigating down the river, as I understand it, you mariners take the depth of water at Lock 28 or the Morrisburg Canal, they are the same, and if you have 16 feet there you feel you can go down the rapids at the Rapide Plat.

Mr. DALY. Yes, sir.

Mr. KEEFER. And with 16 feet at the Morrisburg Canal you go on to run the rapids.

Mr. DALY. I will answer that personally myself, all the time I have gone up and down that river I never looked at the gauge.

Mr. KEEFER. We have Mr. Lea telling us that and I generally pay a great deal of attention to what he says; 16 feet at Morrisburg will give you 14 feet on the rapids.

Mr. KING. To tow into the Morrisburg lock is a difficult matter.

Mr. DALY. Yes, sir.

Mr. KING. It is a troublesome matter.

Mr. DALY. Yes, sir.

Mr. KING. And, naturally, you would rather run the rapids with a tow if you can; you don't take tows down the canal at all?

Mr. DALY. No; it is a very rare thing.

Mr. KING. I don't think it is done at all, I don't think it is practicable without extra tugs.

Mr. DALY. You would have to have extra tugs.

Mr. KING. And, therefore, the boats lighten at Kingston when it is necessary to run the rapids.

Mr. DALY. Yes; sir.

Mr. KING. Now then, if you have at the Morrisburg Canal anything less than 16 feet they would have to lighten at Kingston, or otherwise they could not go down the 14-foot water in the rapids. They would have to lighten so that they could go down. That is the reason why they do lighten at Kingston—why don't you answer, there is no difficulty about that.

Mr. DALY. What I was thinking was that there were some that go down there and others don't.

Mr. KING. Just answer my question: when they have to lighten they do their lightering at Kingston.

Mr. DALY. Yes, sir.

Mr. KING. And if they have not 14-foot water they do it at Kingston; if they have less than 16 feet at Morrisburg they have to lighten at Kingston.

Mr. DALY. Yes.

Mr. KING. It stands to reason that interferes with navigation. If you at any time get only 14 feet or 14.6 on the Morrisburg Canal, you are compelled to continually lighten, and that is not advisable, is it?

Mr. DALY. No.

Mr. KING. There is a wave in the rapids which we have had described to us. That is said to be a detriment and it is said that these proposed compensating works are going to compensate very much; I refer to the Pitch—what would be the difference on that Pitch if you have 16 feet of water under you or you have 14 feet of water? Would it be much? There would be some little difference, I will concede, but would it be very much in the navigation if——

Mr. DALY. I do not understand your meaning there.

Mr. KING. Where is this Pitch?

Mr. DALY. It is right at the Rapide Plat.

Mr. KING. At the shallow part?

Mr. DALY. Yes.

Mr. KING. At the Hogs Back?

Mr. DALY. Yes.

Mr. KING. As long as you are clear of the bottom, what difference does it make in the depth of water to a foot or two?

Mr. DALY. Well, a boat in shallow water don't handle as well as if the water were deep under her.

Mr. KING. But supposing you are absolutely clear; we will say you have 14 feet under you, and instead of that you get an extra foot, what is the practical difference in that extra foot in navigation?

Mr. DALY. In the handling of a boat it would be quite a difference.

Mr. KING. It would be some, I concede, but is it so much to be magnified as you are making it out here?

Mr. DALY. I think at that point it would be wonderful.

Mr. KING. And you would make it out to be of very great importance to have that extra amount?

Mr. DALY. Yes, sir.

Mr. KING. How would it affect your navigating a boat?

Mr. DALY. In what way?

Mr. KING. In what way would it affect the navigating of a boat?

Mr. DALY. The more water you have underneath the easier to keep her steered.

Mr. KING. What is the effect in the steering and so forth of the Pitch?

Mr. DALY. It is much easier when she has more water under her.

Mr. KING. But she does not drop on the bottom in any way.

Mr. DALY. No.

Mr. POWELL. It is not striking; it is losing steerage way.

Mr. KING. So that you still wish us to understand that we can place a great deal of reliance upon the elimination of this drop that you speak of?

Mr. DALY. That is my personal opinion; of course I have no figures to prove my theory.

Mr. GARDNER. Going over the Pitch, so-called, when the bow of your boat breaks down——

Mr. DALY. Not the bow, it is the stern.

Mr. GARDNER. The stern would drop?

Mr. DALY. Yes; in the Pitches as a rule.

Mr. GARDNER. Would it not make a difference then if she had another foot of water under her?

Mr. DALY. It certainly would; she probably would not hit.

Mr. POWELL. As a matter of fact every seaman wants as much water under his boat as possible.

Mr. DALY. Yes, sir.

Mr. POWELL. And otherwise you can not navigate a vessel; she will sheer everywhere. That is correct, is it?

Mr. DALY. That is correct.

Mr. KING. Coming down with a freighter of full canal size, can you tell me how you get into the head of the Morrisburg Canal; do you go in straight or stern first?

Mr. DALY. I have seen them go in straight, but it is an awful hazardous thing. If I was taking a boat down there I would round her to, and get a line out, and take her down.

Mr. KING. At the upper entrance of the Morrisburg Canal.

Mr. DALY. Yes.

Mr. KING. Is not that the usual practice when freighters are entering?

Mr. DALY. I think it is.

Mr. KING. Have you seen them run their nose on the north bank above the entrance?

Mr. DALY. Yes, sir.

Mr. KING. And swing stern down toward the canal in order to get in that way.

Mr. DALY. Yes.

Mr. KING. Have you seen them round to a little further up the river and come down crab fashion?

Mr. DALY. Yes.

Mr. KING. They could not with safety enter the head of the Morrisburg Canal in the ordinary course, stem first.

Mr. DALY. No.

Mr. KING. You are aware that plans have been under consideration for the improvement of that entrance.

Mr. DALY. I am not.

Mr. KING. You are from the other side of the line, of course, and may not know that.

Mr. DALY. I am.

Mr. KING. And for that reason a freighter would prefer to run down the rapids.

Mr. DALY. Yes.

Mr. KING. Although, ordinarily, the rapids would be more difficult navigation than canal navigation.

Mr. DALY. Barring the entrance.

Mr. KING. You have no particular difficulty for a freighter from the head of the Morrisburg Canal down as far as the Boilers.

Mr. DALY. Nothing until you come to the Pitch.

Mr. KING. And the Pitch you also describe as a cellar.

Mr. DALY. Yes.
Mr. MIGNAULT. Are the Pitch and the cellar the same thing.
Mr. DALY. No, they are not the same thing.
Mr. KING. Distinguish, please.
Mr. DALY. The Pitch is a shoal in the river and the cellar is at the end of the shoal.
Mr. KING. When you go over the shoal you get into the cellar.
Mr. DALY. Yes.
Mr. KING. How it comes to have the name of cellar is because it is lower than the rest of the river.
Mr. DALY. I presume so.
Mr. KING. And you have to go through that.
Mr. DALY. Yes.
Mr. KING. About how wide across the river is that stretch?
Mr. DALY. I can not tell.
Mr. KING. You have gone through it?
Mr. DALY. Hundreds of times.
Mr. KING. It is 50 feet?
Mr. DALY. It would simply be a guess; I would say probably about 125 feet.
Mr. KING. And a full canal-sized freighter is about 43 feet broad?
Mr. DALY. Something like that.
Mr. KING. And what length?
Mr. DALY. They vary from 222 feet to 234 feet, and of course, there are some of them longer than that.
Mr. KING. The locks are 256 feet; are not a number of them built to fit the locks?
Mr. DALY. Yes; there is a steamer in Ogdesnburg that fits the locks tight.
Mr. KING. Then coming down still with a freight term, there is no difficulty in passing Canada Island with a freighter?
Mr. DALY. No.
Mr. KING. Not as much with a freighter as with a tow?
Mr. DALY. We simply hold her head out toward the north bank and under the influence of the current she goes down.
Mr. KING. She goes down slightly sideways with her head toward the bank?
Mr. DALY. Yes.
Mr. KING. Have you any knowledge of a freighter getting into difficulty at any time on the shallow water between Canada Island and Ogden Island?
Mr. DALY. A great many years ago, but, of course, that was through some trouble with the steering gear. I remember one accident with a steamer there.
Mr. KING. Where her steering gear had got out of order?
Mr. DALY. I would not say it was the steering gear, but some part of the machinery went wrong.
Mr. KING. What happened to her was due entirely to something that went wrong with the boat?
Mr. DALY. Yes.
Mr. KING. Coming down with a tow you choose the outside channel, because you find it impossible to get into the canal, is that right?

Mr. DALY. Yes, sir.

Mr. KING. The difficulty being much greater in getting in with a tow than with a single freighter.

Mr. DALY. Yes, sir.

Mr. KING. Then when you reach the Pitch, your difficulty is accentuated with a tow as compared with a freighter, because the tow will swing behind the tug sometimes.

Mr. DALY. Yes.

Mr. KING. And will not follow the exact course of the tug.

Mr. DALY. Yes.

Mr. KING. I suppose you come with a fairly short line.

Mr. DALY. Yes, sir.

Mr. KING. So as to cut down that swing as much as possible?

Mr. DALY. Yes, sir.

Mr. KING. Being entirely ahead of the tow you have no way of checking the tow or driving it back in any way and it will take a swing.

Mr. DALY. Yes.

Mr. KING. And run more danger than a freighter of striking one side or the other of the channel?

Mr. DALY. Naturally; yes.

Mr. KING. And in fact tows do frequently strike one side or the other at some point or other of the Hog's Back?

Mr. DALY. Occasionally.

Mr. KING. That is one of the dangers that is feared in going down there?

Mr. DALY. Yes, sir.

Mr. KING. And they don't only do that when there is 14 feet in the channel, but when there may be 14 feet 1, 14 feet 2, 14 feet 3 or more inches?

Mr. DALY. It is more apt to be when the water is shallow.

Mr. KING. Quite true; but it can happen when the water is above the 14-foot mark?

Mr. DALY. Yes.

Mr. KING. Because of the liability of encountering obstructions on the bottom at one side or the other of the actual proper channel?

Mr. DALY. Yes, sir.

Mr. KING. And it is not quite proper to estimate the safety of navigation with regard only to 14 feet in the center of the real channel?

Mr. DALY. No.

Mr. KING. There is danger at all times?

Mr. DALY. Yes, sir.

Mr. KING. And the danger is measured with regard to the depth available?

Mr. DALY. Yes.

Mr. KING. And the greater the depth available the greater the safety?

Mr. DALY. Yes.

Mr. KING. And the less the depth the greater the danger?

Mr. DALY. Yes, sir.

Mr. KING. Coming with a tow past Canada Island, your greatest difficulty is with side drafts?

Mr. DALY. Yes, sir.

Mr. KING. Have you any recollection of any barge running on between Canada Island and Ogden Island under circumstances other that the breaking of a towline or some defective motor power, or steering on the tug?

Mr. DALY. I can not recollect any.

Mr. KING. And granting that some such occurrence does take place, or that control is lost, even when the proposed embankment is built, the barges are liable to take bottom somewhere else?

Mr. DALY. No; I would not say that.

Mr. KING. Why?

Mr. DALY. I would say with that embankment there, providing a tow was going down the natural course, and the line gives when they would get down near the foot of the island, the natural flow of the current would be more to the center of the channel and would take her down there.

Mr. KING. Still out of control?

Mr. DALY. Out of control.

Mr. KING. And at the mercy of the wind and water?

Mr. DALY. Sure.

Mr. KING. And just because of the side draft they happened to take bottom at the point you indicated?

Mr. DALY. Yes.

Mr. KING. In which case, they were also out of control.

Mr. DALY. Yes.

Mr. KING. You mentioned the tug *Seymour*.

Mr. DALY. Yes.

Mr. KING. And also the *H. B.* and the *Buckley*, and the *Scotland*.

Mr. DALY. Yes.

Mr. KING. How old are these barges?

Mr. DALY. I do not believe I would be able to answer.

Mr. KING. Were they born before you?

Mr. DALY. I think the *Scotland* is pretty near older than I. The *Buckley* and the *H. B.* are much younger barges.

Mr. KING. I suppose boats of that age are not always equipped with the most up-to-date and modern equipment.

Mr. DALY. No.

Mr. KING. And the towlines may be a little older than on a modern up-to-date steel barge.

Mr. DALY. No. I would not say that.

Mr. POWELL. The towlines are not commensurate with the age of the barge.

Mr. KING. I know they use half a dozen towlines in a season, but I was asking the question of the captain—do you know in this particular instance that you have referred to what the character of the towline was?

Mr. DALY. No.

Mr. KING. What happened was that the towline broke and then trouble occurred?

Mr. DALY. Yes.

Mr. POWELL. There seem to have been very few accidents there.

Mr. KING. Very few.

Mr. POWELL. Ask the witness if he knows of any more. We have only had three so far, and he has been familiar with the channel all his life.

Mr. KING. Of course, it is perfect rubbish to talk about this being a graveyard.

Mr. POWELL. Ask him.

Mr. KING. How many accidents can you enumerate?

Mr. DALY. I can not answer that.

Mr. MIGNAULT. Your experience covers what period of years?

Mr. DALY. I have been running up and down there for the last 40 years. I have seen a great many wrecks in there, how many I can not state.

Mr. KING. And you have answered that you know of no case where a wreck occurred except it was through loss of control or defective machinery of some kind.

Mr. DALY. Yes, that I know of.

Mr. KING. I am asking you for your personal knowledge, and you have given it.

Mr. POWELL. Can you give us some idea of the number of wrecks?

Mr. DALY. I can not do it.

Mr. VAN KENNEN. You use the expression that there were a great number—what do you mean, 10, or 12, or 20, or what?

Mr. KING. Don't encourage the witness too much.

Mr. DALY. I would rather not answer the question, because I do not feel that I can remember.

Mr. KING. You have had a good deal of experience with tugs, captain, as well as freighters?

Mr. DALY. Yes, sir, more with tugs.

Mr. KING. Have you had enough experience upstream to speak with practical knowledge of the difficulties?

Mr. DALY. I feel that way now.

Mr. KING. How many tugs have you taken up there?

Mr. DALY. I can not say; I have taken so many tugs up there that I can not remember.

Mr. KING. So many that you feel you have accumulated sufficient knowledge to tell the commissioners about the upstream course?

Mr. DALY. Yes.

Mr. KING. Distinguish between what you call an eddy and what is called slack water.

Mr. DALY. An eddy is generally formed from a point projecting out in the river, and it in turn forms slack water. In some cases the eddy flows up the river, and in other cases it gradually goes down a little, with a lot of boilers in it.

Mr. KING. Would I not be right in saying that between the main current of the stream flowing down, and a possible eddy which may or may not actually flow out at the shore, there would be a certain amount of slack water, so that you might have the main current flowing down, nearer the shore you might have slack water, and if you got far enough in you might actually find the eddy going forward?

Mr. DALY. I think so.

Mr. KING. The smaller the boat the easier to get gradually out?

Mr. DALY. Yes.

Mr. KING. A boat of some size might have to confine herself to the slack water?

Mr. DALY. Yes.

Mr. KING. But in any event, coming upstream she selects slack water or eddy?

Mr. DALY. Yes.

Mr. KING. And she never contends with the main current?

Mr. DALY. Not if she can get out of it.

Mr. KING. So that her difficulty has not to be measured with reference to the velocity of the main current?

Mr. DALY. There is a way that you could take that; if there is speed enough in the boat she can take the main current.

Mr. KING. Do you know any boat that could get up the main current, a freighter could not do it?

Mr. DALY. A freighter could not do it.

Mr. KING. You don't know whether the Richelieu & Ontario boats do it.

Mr. DALY. I doubt myself if they could go up the center.

Mr. KING. Taking advantage of the means you have indicated, and holding well toward Canada Island in the slack water, or if your boat is small enough getting into the eddy, you keep alongside Canada Island.

Mr. DALY. Yes, sir.

Mr. KING. Then you head for similar conditions on the north side.

Mr. DALY. Yes.

Mr. KING. And to do that, you have to cross the main stream.

Mr. DALY. Yes.

Mr. KING. You don't go right up the stream?

Mr. DALY. No; we cross over.

Mr. KING. And are there not occasions with certain boats when you actually fail to make the opposite side and have to try it all over again?

Mr. DALY. Sometimes.

Mr. KING. The current being too much for your boat.

Mr. DALY. Yes.

Mr. KING. And if you added one-half to that current the upstream navigation would ordinarily be an impossibility.

Mr. DALY. No; I do not think so.

Mr. KING. Not even if you failed to make it the first time.

Mr. DALY. No; because there are so many reasons why you can fail. Your boat may not be steaming good; your pilot may not get into the point right. There are so many ways you can make a failure.

Mr. KING. You go this far, captain, that it is a matter sometimes of considerable difficulty to contend with that current and actually make your objective on the north bank.

Mr. DALY. With the boat headed into that current at the point on Canada Island, and her steaming qualities good, and everything good, she ought to make the eddy on the other side.

Mr. KING. But you tell me that she sometimes fails.

Mr. DALY. She has done so for the reasons I have given.

Mr. KING. Steam down a little?

Mr. DALY. Steam down.

Mr. KING. Engineer sick?

Mr. DALY. I would not go into that part of it. The steam may be low, or the pilot may not have given her a fair chance at the point.

Mr. KING. I suppose you admit that if you add about one-half the current on to the existing conditions, it would be just half as bad again.

Mr. DALY. At that particular point, I would say no.

Mr. KING. Why?

Mr. DALY. Because the water is going to be backed there.

Mr. KING. Backed where?

Mr. DALY. At the head of Canada Island, on the west side of Canada Island, the water is backed there. You are going to have, in my opinion, a better eddy alongside of Canada Island than you have to-day because when the water is raised it is going to set an eddy from there.

Mr. KING. That might be all right for the eddy along Canada Island, but how about the current in the main stream?

Mr. DALY. That being true, the boat is coming up there with more steam than she has had hitherto, and she is going to go out into that current, and she is going to jump.

Mr. KING. You get a better leap-off.

Mr. DALY. Yes; and she gets over that.

Mr. KING. And with the impetus of that leap-off, she can make the half mile or so that would take her to the other side.

Mr. DALY. Yes.

Mr. KING. It is more than half a mile.

Mr. DALY. I do not know just what it is.

Mr. KING. Is not the experience you have that if you get away from the dock with a good start you will be that much stronger and faster at the end of the half mile?

Mr. DALY. Not always; some boats go the other way.

Mr. KING. You have spoken about the elimination of the cellar by this embankment; how do you know it is going to be eliminated?

Mr. DALY. That is my own idea.

Mr. KING. Is it an engineering or a navigation explanation?

Capt. DALY. Navigation, I presume.

Mr. KING. Navigation?

Capt. DALY. Well, I will not say that. I will say this, that in my experience in dredging I have seen a great many channels changing, different formations, different ways, and I use that as my judgment against this.

Mr. KING. Then, from what experience you have had in dredging you think an embankment so far down the river is going to eliminate what is called a cellar up in the Rapide Plat?

Capt. DALY. I would say so.

Mr. KING. And the cellar is about 2 feet deep?

Capt. DALY. In that neighborhood.

Mr. KING. By the cellar, I mean the depression in the water below the surrounding surface.

Capt. DALY. Yes, sir.

Mr. KING. You think that 2 feet will disappear because of this embankment?

Capt. DALY. Yes, sir.

Mr. KING. You heard Mr. Lea's evidence yesterday, did you, that he hoped to give us about 3 inches more water on the Hog's Back?

Capt. DALY. Yes, sir.

Mr. KING. Then, where do you get your 2 feet?

Capt. DALY. When you force the water up there you are simply going to fill that cellar in.

Mr. KING. Is the cellar due to a depression in the river bed, or is it due to the pitch over the Hogs Back?

Capt. DALY. It is a depression in the river bed, I would say, but I have no authority for that at all.

Mr. KING. It might be the water pitching over the Hogs Back and then rising again as it comes up below?

Capt. DALY. Yes; but I would naturally think it was the depression below.

Mr. KING. Do you suggest that a depression of 3 inches at that point would eliminate——

Capt. DALY. I do not say 3 inches. I put it from seven to eight-tenths.

Mr. KING. How did you get that?

Capt. DALY. That is simply my honest opinion.

Mr. KING. As to the effect of backwater in the river?

Capt. DALY. Yes, sir.

Mr. KING. How do you base that upon any dredging?

Capt. DALY. It is not based upon that; it is just my judgment. Looking at it in a general way, if this jam is practically tight I can not see any other result except a back-up there.

Mr. KING. Do you feel yourself capable of telling me how far up the river that water would go?

Capt. DALY. No.

Mr. KING. You think it would go to the rapids?

Capt. DALY. Yes.

Mr. KING. You base that simply on your good judgment?

Capt. DALY. No; I will withdraw that good judgment.

Mr. KING. What consideration do you give to the withdrawal of 30,000 cubic feet per second at the Little River?

Capt. DALY. Now, I am not an engineer.

Mr. KING. But you have gone so far as to express an opinion here as to the effect of the embankment, and I want you to join up with that the effect of 30,000 cubic feet withdrawal up above. Would that lower the water at the rapids?

Capt. DALY. No; I do not think it would.

Mr. KING. Well, I am quite content to leave that. You mean that the withdrawal up above would not have any effect by way of lowering the water in the main channel?

Capt. DALY. Not if they put a weir up there.

Mr. KING. If they put a weir opposite the Morrisburg Canal?

Capt. DALY. Yes.

Mr. KING. Why?

Capt. DALY. It would back the water up.

Mr. KING. You think the effect of the weir would actually be to compensate for the 30,000 cubic feet per second withdrawn into the Little River?

Capt. DALY. I would say yes.

Mr. TAWNEY. Mr. King, is that the proposition?

Mr. KING. That is not the application. It is the witness's proposition.

Mr. VAN KENNEN. I think he is confused.

Mr. KING. Just a minute, please.

Mr. VAN KENNEN. May I address the court? I want to call the court's attention to the fact that the witness has confused the idea of the weir with the embankment.

Mr. MIGNAULT. But you can take the witness and bring that out.

Mr. KING. You used the words, Capt. Daly, "submerged weir," and by that you referred to the submerged weir at the head of the Morrisburg Canal?

Capt. DALY. Yes, sir.

Mr. KING. I ask you how you suppose that the 30,000 cubic feet per second which is to be drawn into the Little River is not going to have an effect on the level of the rapids, and you state that the submerged weir at the head of the Morrisburg Canal is going to fix that.

Capt. DALY. Now you are taking me into an engineering problem.

Mr. KING. And you would rather keep out of it?

Capt. DALY. Yes; I would.

Mr. KING. Then, I think it would be perhaps fair to let you keep out of it. And may I ask you to retire from your position taken with regard to the embankment?

Capt. DALY. No; I will hold to that.

Mr. KING. Although it is an engineering problem?

Capt. DALY. Well, call it so if you like.

Mr. KING. You rather like that?

Capt. DALY. I like that part down there.

Mr. TAWNEY. It is also a common-sense problem, is it not?

Capt. DALY. It may be.

Mr. KING. Except as to distances and depths, Mr. Tawney. Do I understand, Capt. Daly, that you have not made use of the gauges at Cardinal to estimate your depth in the rapids?

Capt. DALY. The way I have always planned that, and a great many of my followers, we follow the shore line. We form our opinion along the shore, whether the water is good or not. We say at home it is a very ready thing for us because we have the marks right at our docks at Ogdensburg.

Mr. KING. And you do not have to rely on Cardinal?

Capt. DALY. No.

Mr. KING. It is true, is it not, that varying conditions of wind have a serious effect on the level?

Capt. DALY. Yes.

Mr. KING. And you have not had at times to lie up for 48 hours?

Capt. DALY. Yes; I think we have.

Mr. KING. Waiting for enough water to get down?

Capt. DALY. Yes.

Mr. KING. And without certainty, then, that was within an inch or two of the mark and you took a shot at it?

Capt. DALY. Yes.

Mr. KING. What license is it you have?

Capt. DALY. An American license.
Mr. KING. For what boats?
Capt. DALY. An unlimited license.
Mr. KING. And that was obtained some years ago?
Capt. DALY. Quite a number of years ago.
Mr. KING. You spoke about an experience prior to that. Did you have any wrecks in your time?
Capt. DALY. No; I have been fortunate.
Mr. VAN KENNEN. Mr. Chairman, I have a witness here, Capt. Mallan, who, I understand, has a telegram requesting him to be at Kingston to-night. Capt. Mallon, will you step forward a moment?
Mr. KING. I want an opportunity to examine him fully, and I can not consent to his release if he wants to get away at 2 o'clock this afternoon on the Canadian Pacific Railway.
Mr. KEEFER. Capt. Daly, you spoke of this cellar. What is the depth of that cellar?
Capt. DALY. I could not tell you.
Mr. KEEFER. Estimate it roughly.
Capt. DALY. No; I could not.
Mr. KEEFER. Well, you talk about its being filled with the backwater. Mr. Lea has told us what he estimates the backwater to be. How much do you estimate is necessary to fill that cellar with backwater?
Capt. DALY. From seven to nine tenths will fill that.
Mr. KEEFER. From seven to nine tenths of a foot?
Capt. DALY. Yes, sir.
Mr. KEEFER. Then, if you do not get your seven to nine tenths of a foot of water you do not fill the cellar?
Capt. DALY. I would not say that.
Mr. KEEFER. Well, what do you say?
Capt. DALY. I say that from seven to nine tenths of a foot, in my opinion, will fill that cellar.
Mr. KEEFER. Then, if Mr. Lea estimates that he can give us at low-water stage only 3 inches you do not fill that cellar?
Capt. DALY. I could not say that.
Mr. POWELL. Capt. Daly, you spoke about these tugboats. Are they large sized boats?
Capt. DALY. They are fair sized boats, boats from 70 to 90 feet long.
Mr. POWELL. Would the *W. L. Proctor* be a sample?
Capt. DALY. They would be just a little larger than the *Proctor*.
Mr. POWELL. Were you in Mr. Proctor's employ during his lifetime?
Capt. DALY. No, sir.
Mr. KING. You have had experience in both high and low stages of the river, Capt. Daly?
Capt. DALY. Yes, sir.
Mr. KING. And you never saw the cellar eliminated yet, did you?
Capt. DALY. I saw the cellar eliminated one winter.
Mr. KING. I am not talking about winter; I am talking about summer.
Capt. DALY. No.

Mr. KING. It is always there, even when the river is up 2 feet above what it is to-day it never disappeared?

Capt. DALY. No.

LUKE MALLAN, a witness produced for and on behalf of the applicant, after being first duly sworn, was examined and testified as follows:

Mr. VAN KENNEN. Where do you reside, Capt. Mallan?

Capt. MALLAN. Morrisburg.

Mr. VAN KENNEN. What has been your business during your active life?

Capt. MALLAN. Steamboat man.

Mr. VAN KENNEN. About how many years has that covered?

Capt. MALLAN. Most of my lifetime.

Mr. VAN KENNEN. Well, about how many years would that be?

Capt. MALLAN. About 25 years.

Mr. VAN KENNEN. You have been a navigator principally on what river?

Capt. MALLAN. The St. Lawrence.

Mr. VAN KENNEN. And have you been duly licensed?

Capt. MALLAN. Yes, sir.

Mr. VAN KENNEN. How long have you had a license as a pilot?

Capt. MALLAN. Eighteen to twenty years.

Mr. VAN KENNEN. Have you as such been been operating tugs?

Capt. MALLAN. Yes, sir; steamboats, tugs, and barges.

Mr. VAN KENNEN. Have you also in the operation of tugs had charge of tugs with tows?

Capt. MALLAN. Yes, sir.

Mr. VAN KENNEN. Have you had much experience as a tug man with tows?

Capt. MALLAN. Yes, sir; quite a lot.

Mr. VAN KENNEN. For how many years has that been true?

Capt. MALLAN. I was with the M. T. Co. in the neighborhood of about 12 years tugging for them.

Mr. VAN KENNEN. Have you been with any other lines of boats?

Capt. MALLAN. Yes; I have been a pilot of big boats.

Mr. VAN KENNEN. You mean freight boats, do you?

Capt. MALLAN. Freight boats, yes; from Kingston to Montreal.

Mr. VAN KENNEN. About what sized tows have you been in the habit of handling?

Capt. MALLAN. Three or four. Four would be the largest number.

Mr. VAN KENNEN. What would be their draft?

Capt. MALLAN. Maybe three or four of them 14 feet and the rest from 10 to 12.

Mr. VAN KENNEN. Has all your work been practically continuous during the season of navigation each year while you were employed?

Capt. MALLAN. Yes, sir.

Mr. VAN KENNEN. In doing this work how often, approximately, would you navigate the north channel of the river?

Capt. MALLAN. Sometimes we would go down two or three times a week, and sometimes only once a week.

Mr. VAN KENNEN. When going down there have you been in the habit yourself of navigating the boats?

Capt. MALLAN. I have always taken her down myself, yes, sir.

Mr. VAN KENNEN. Would you undertake to describe to this commission, approximately, the course that you would take, beginning at the entrance or opposite Lock No. 24?

Mr. POWELL. Is there any particular point in that?

Mr. VAN KENNEN. I did not know but what they might be claiming other channels.

Mr. POWELL. There is only one channel there.

Capt. MALLAN. There are two channels going down there.

Mr. VAN KENNEN. I think there is only one practical channel.

Capt. MALLAN. There is a point just opposite Marytown Bay.

Mr. POWELL. But, as I understand it, there is the effect of the river generally. It does not make any difference which side you go on?

Capt. MALLAN. Certainly not.

Mr. VAN KENNEN. Well, what do you discover when you get down to a point that has been described as the Hog's Back? Describe how you approach it.

Capt. MALLAN. To keep in the deep water, do you mean?

Mr. VAN KENNEN. To keep your tow safe.

Capt. MALLAN. After we pass what we call the shoals to the right-hand side going down, we start then and keep over as far as we can. We have two points at the foot of Ogden Island. Sometimes we can keep them open and sometimes we can not.

Mr. VAN KENNEN. Why do you keep to the north shore?

Capt. MALLAN. We keep to the south shore in order to get deep water.

Mr. VAN KENNEN. What point are you describing?

Capt. MALLAN. I am describing the point of the foot of Ogden Island and Millpitch. That is our mark going down.

Mr. VAN KENNEN. When you are hugging the Canadian side where are you in your course?

Capt. MALLAN. When we are going down, that is what we call the Shears.

Mr. VAN KENNEN. Is that what you call the Hog's Back?

Capt. MALLAN. No; we are above that.

Mr. VAN KENNEN. I am speaking about the Hog's Back or the Cellar.

Capt. MALLEN. The farther over we can get when we are going through the Cellar the better water we get with the tow.

Mr. VAN KENNEN. How do you handle your tow in going over there?

Capt. MALLAN. As soon as we get going around the Shears we start to fight, and with the tow you can not get over too far. We pull over toward Ogden Bay just as far as we can get.

Mr. VAN KENNEN. And that has the effect of straightening up your tow?

Capt. MALLAN. Of course, everybody has to be wise going down there. If I am going down with a heavy tow I generally like to roll down, for when they go down straight they take a drop and unship their rudders. I like my tow to roll down.

Mr. VAN KENNEN. Will you describe to these landsmen like myself what you mean by "rolling?"

Capt. MALLAN. In rolling down they go down sidewise. If they go downstream they hit their heel after they go over the pitch. In going down sidewise they do not get that drop.

Mr. VAN KENNEN. In other words, the width of the boat is not as great as the length, and, consequently, you get over it without hitting.

Capt. MALLAN. Exactly.

Mr. MIGNAULT. Does that strain the towline?

Capt. MALLAN. Yes. We drop over the pitch, we get in slack water and we naturally slacken our line.

Mr. VAN KENNEN. But it has that effect of slackening your line?

Capt. MALLAN. Always.

Mr. VAN KENNEN. What is the effect when you come out of that?

Capt. MALLAN. We have to watch our tug carefully so she does not jump on them and break them. Sometimes we can get our cushion.

Mr. VAN KENNEN. What do you mean by that?

Capt. MALLAN. To check the tug down so she will not pick up the slack too quickly.

Mr. VAN KENNEN. Starting from that point and navigating down with your tow, when you get farther down toward what you call Millpitch Point, how do you operate your tow?

Capt. MALLAN. We fight the towpath all the way down. We do that in order to keep from going in between Canada Island and the foot of Ogden Island.

Mr. VAN KENNEN. How do you operate your tug?

Capt. MALLAN. It is pretty hard to explain that. With the tow going down there we operate our tug. We fight the bank as much as we can and keep our tug ahead of the tow. We keep up to the north shore, hold our tug as far as we can to the north shore. We have to keep ahead of our tow. If we hold up too much the tow might turn us around. It is hard to explain that unless you are on the boat.

Mr. VAN KENNEN. That is for the purpose of keeping your tow, as I understand it, away from the cross current between Canada Island and Ogden Island?

Capt. MALLAN. Yes, sir; that is the idea.

Mr. POWELL. That is you work over to the Canadian shore?

Capt. MALLAN. To the towpath; yes, sir.

Mr. POWELL. Then, after you get down a little farther toward Canada Island and get outside of the influence of that side current, what do you do?

Mr. SPRATT. Let him state what he saw there about side current.

Capt. MALLAN. In what way?

Mr. VAN KENNEN. Well, what effect does that side current have on your tow?

Capt. MALLAN. It draws it right in there all the time. If anything happens we would naturally go right in there. If we get a northeast wind we have a lot of bother. One time I was afraid my barges were going to hit Canada Island.

Mr. VAN KENNEN. Have you had the experience of actually hitting them?

Capt. MALLAN. No; I never did.

Mr. VAN KENNEN. But you came close to it?

Capt. MALLAN. Very close to it, yes.

Mr. VAN KENNEN. What experience have you had?

Capt. MALLAN. I have been close enough to make it very uncomfortable there.

Mr. VAN KENNEN. What do you know of the difficulties from one cause or another where the boats have been wrecked on that shoal?

Capt. MALLAN. I worked there 10 days on the *Quebec* and the *Burma* when they were in there.

Mr. VAN KENNEN. About when was that?

Capt. MALLAN. I guess it would be three or four years ago. I worked there all the time they were in there and took them out.

Mr. VAN KENNEN. What other experience have you had?

Capt. MALLAN. I have seen other boats in there.

Mr. VAN KENNEN. How many boats?

Capt. MALLAN. The *Estella Reed*, for one. I am not going to say what the names of those boats were.

Mr. VAN KENNEN. How many were there?

Capt. MALLAN. Two.

Mr. VAN KENNEN. Were there any others that you remember?

Capt. MALLAN. There was a vessel at that time, too.

Mr. VAN KENNEN. Do you remember the name of the vessel?

Capt. MALLAN. I do not know her name.

Mr. VAN KENNEN. Was she a full-sized freighter?

Capt. MALLAN. No, she was a schooner. She carried about 600 tons of coal.

Mr. VAN KENNEN. Do you remember any others?

Capt. MALLAN. I remember the barge *Jet*. She went in there.

Mr. VAN KENNEN. Are there any others that you remember?

Capt. MALLAN. That is about all, I think.

Mr. VAN KENNEN. In any stretch of the river from Ogdensburg, or I will say from Iriquois, down through the Gooseneck Island have you ever known of any stretch where there has been so many calamities like that?

Mr. KING. That is a leading question?

Capt. MALLAN. I never did. I have more dread of Canada Island than any other place in the river, and any pilot will say the same.

Mr. VAN KENNEN. Can you compare the strength of the current between Canada Island and Ogden Island and Canada Island and the main shore?

Capt. MALLAN. No; I can not.

Mr. VAN KENNEN. What would you say about them?

Capt. MALLAN. I do not think there is very much difference in the current dragging through here [indicating on the map] that there is in the main channel.

Mr. VAN KENNEN. You said that you had a dread of Canada Island. Explain what you mean by that.

Capt. MALLAN. I mean the draft going between the foot of Ogden Island and Canada Island. While we are going down the river with a tow we have to fight the towpath all the way down in order to keep from hitting Canada Island by the suction in here [indicating].

Mr. VAN KENNEN. Have you ever had any experience upstream there?

Capt. MALLAN. Yes, sir.

Mr. VAN KENNEN. Aside from the light-draft passenger vessels, is there any upstream traffic that you know anything about?

Capt. MALLAN. No, sir; there is nothing going up through there only the passenger or excursion boats that I know of at the present time.

Mr. VAN KENNEN. Do you have to maneuver your summer vessels the same way to a degree in order to avoid that passage?

Capt. MALLAN. A lone boat?

Mr. VAN KENNEN. Yes.

Capt. MALLAN. No; I never bother with Canada Island with a lone boat.

Mr. VAN KENNEN. As a tug man of experience in that section, I would like to ask you your opinion with respect to the benefit, or otherwise, of navigation by the construction of that embankment between Ogden Island and Canada Island.

Capt. MALLAN. I think it would make it better.

Mr. VAN KENNEN. Just tell me briefly why you think it would be better.

Capt. MALLAN. It would make it better by stopping that side draft and making it a straighter current down there. That is why I think it would be better.

Mr. VAN KENNEN. That you speak of particularly with reference to tugboats?

Capt. MALLAN. Yes, sir.

Mr. KEEFER. Capt. Mallan, you spoke of the graveyard or that bad place between Ogden Island and Canada Island. It is very desirable to get rid of that, is it not?

Capt. MALLAN. Yes, sir.

Mr. KEEFER. Quite apart from this application, you think it would be good business to have a protecting dam there, do you not?

Capt. MALLAN. I do, sir.

Mr. KEEFER. And if it is in Canadian territory and it is an improvement to navigation, I suppose you would say the Canadian Government ought to build it?

Capt. MALLAN. Yes, sir.

Mr. KEEFER. It has nothing to do with a power scheme?

Capt. MALLAN. No, sir.

Mr. KEEFER. We have had considerable testimony as regards the benefit to navigation of this connecting dam between Canada Island and Ogden Island. I do not think anybody is differing about that. It is a question of how much benefit there is.

Mr. MAGRATH. Did you say that no one was objecting to it?

Mr. KEEFER. I have not heard anyone objecting to that.

Mr. KING. You probably did not hear my cross-examination.

Mr. KEEFER. Probably not. We have had a great deal of testimony about the question of diverting a certain amount of water. Capt. Mallan, what would you say would be the effect of taking more water out of the channel above Ogden Island and diverting it down the Little River?

Capt. MALLAN. I am not an engineer.

Mr. KEEFER. No, but you are a navigator. You are here to tell us all about the benefit of that connection between Ogden Island and Canada Island. I would like to ask you to tell me what would be the effect of taking more water out of that stream, the north channel.

Capt. MALLAN. Above?

Mr. KEEFER. Yes; taking it out of here [indicating] from the Little River?

Capt. MALLAN. Well, I am not an engineer. I do not knew whether that would have any effect or not.

Mr. KEEFER. Well, you have navigated there?

Capt. MALLAN. I have; yes, sir.

Mr. KEEFER. You have seen tows come down there frequently?

Capt. MALLAN. I have brought them down.

Mr. KEEFER. You never took a tow down the Morrisburg Canal, did you?

Capt. MALLAN. Yes, sir; I was the first man that ever dropped a barge in the Morrisburg Canal of 14 feet. I had to take her in the canal.

Mr. KEEFER. How did you do it? Did you have a tug to help you?

Capt. MALLAN. Just with my tug alone.

Mr. KEEFER. It is not the customary procedure, is it? They want to run the rapids if they can?

Capt. MALLAN. If the water is high enough.

Mr. KEEFER. If not, they generally lighter at Kingston?

Capt. MALLAN. We did not; some do. I worked for the M. T. Co., and they loaded a barge to 14 feet, and if there was not water in the rapids I went down the Morrisburg Canal.

Mr. KEEFER. Why did you come to that conclusion?

Capt. MALLAN. I have peculiar marks of my own on the river.

Mr. KEEFER. Those would be your gauges?

Capt. MALLAN. They would be my gauges; yes, sir.

Mr. KEEFER. So, if you had your gauges correlated to the other gauges you could tell us exactly what the level at the sill would be?

Capt. MALLAN. At Iriquois Point I have certain marks which I know myself.

Mr. KEEFER. So when you see the water is down below those marks you know you can not run the rapids?

Capt. MALLAN. Yes; and I go down through the head of Morrisburg Canal. I have rounded my barges in there one at a time.

Mr. KEEFER. The previous witness has told us that it is very difficult to take barges into that canal.

Capt. MALLAN. Yes; it is a pretty difficult proposition. You do not want to make any mistakes, sir.

Mr. KEEFER. Do you know of any other captains that do it?

Capt. MALLAN. Yes; I think there have been others. There have been many captains taking boats in.

I have taken them in and when the water was not high enough in the Rapide Plat for me I went through the canal.

Mr. KEEFER. You can not give me any idea of what the relation of your marks are to the gauges there?

Capt. MALLAN. No, sir; I can not.

Mr. KEEFER. You can not tell me how much water you must have on the sill?

Capt. MALLAN. Yes; I go by the tide gauges at the lift lock.

Mr. KEEFER. Mr. Lea has told us that it was 16.1 feet.

Capt. MALLAN. I would say around there.

Mr. KEEFER. If you have that you can go down the Rapide Plat; if you have not, you can not go down?

Capt. MALLAN. We can not with a boat of 14-foot draft.

Mr. KEEFER. Therefore, would it be advisable to keep the water up at 16 at the sill?

Capt. MALLAN. Yes.

Mr. KEEFER. Anything that would be contrary to that would be difficult to the navigation of the Rapide Plat?

Capt. MALLAN. Yes, sir.

Mr. KEEFER. You are not going to tell us what the effect of that dam is, so far as backwater is concerned, like the previous witness did?

Capt. MALLAN. At the head of Morrisburg?

Mr. KEEFER. No; at the head of the Rapide Plat.

Capt. MALLAN. Between Canada Island and Ogden Island?

Mr. KEEFER. Yes; how far it will carry the backwater. I think that would be better left to the engineering testimony.

Capt. MALLAN. Yes; I think so. It would raise it some.

Mr. KEEFER. How far up would it carry it?

Capt. MALLAN. I can not tell.

Mr. KEEFER. Would it carry it up to the cellar?

Capt. MALLAN. I think it would.

Mr. KEEFER. Is there any particular depth in this cellar that they speak of?

Capt. MALLAN. Yes; there is. It is according to the gauge at the lift lock. We go by that. If we get 16 feet and 1 or 2 inches at the lift lock we can go down the rapids.

Mr. KEEFER. What is the difference in level of the water at the top of the so-called cellar and the rise downstream? Is it from seven to nine-tenths of a foot, as you heard the previous witness say?

Capt. MALLAN. I do not know.

Mr. GARDNER. Captain, what is the reason for the difficulty in entering the Morrisburg Canal?

Capt. MALLAN. Well, there are different reasons. We have got to round to up at the head and drop down stern first.

Mr. KING. The commissioner is asking you why that is so.

Mr. GARDNER. Yes; why do you do it?

Capt. MALLAN. There is not enough water in the Rapide Plat for us.

Mr. GARDNER. You have the honor, as I understand it, of being the only one that has taken a tow of barges into the Morrisburg Canal?

Capt. MALLAN. I was the first one, sir; yes.

Mr. GARDNER. What I wanted to know was what is the reason of its being so difficult to get into that canal?

Capt. MALLAN. We can not go head down; we have not the distance from the end of the pier to stop our barge. We can not get her stopped in time, so we round her head to and stop her so she does not go in with the current.

Mr. GARDNER. In the event of that current being slowed up by the construction of a wier down there, if it would have that effect, would that improve the condition in entering the canal?

Capt. MALLAN. We would not have to go in the canal. I think it would help us to raise the water in the Rapide Plat so we would not have t swing in there when the water is low.

Mr. GARDNER. What would be the effect if you did swing in?

Capt. MALLAN. I do not quite understand you.

Mr. GARDNER. The proposition here is to put in a fill in a portion of the river.

Capt. MALLAN. Of course, I do not know anything about that.

Mr. GARDNER. As a practical man, I wanted to know if you thought any obstruction that is placed there would have a tendency to slow up the current, would make it easier to enter the canal than at the present time.

Capt. MALLAN. If you slow up the current it would. Of course, that I do not know about. I am not a civil engineer.

Mr. POWELL. Is that depth of water between Ogden Island and the Canadian shore equal to the ordinary or average depth of the river?

Capt. MALLAN. I guess it is. It is quite deep there. I do not know what depth it is.

Mr. POWELL. You have never had occasion to take soundings?

Capt. MALLAN. No.

Mr. POWELL. It is narrower than at any other place until you get up to the departure from the main stream of the south channel?

Capt. MALLAN. Yes.

Mr. POWELL. Is it much narrower?

Capt. MALLAN. Not much.

Mr. VAN KENNEN. Captain, do you remember when they reconstructed the canal to make it down to its so-called depth of 14 feet?

Capt. MALLAN. No, sir; I do not know and I worked on it all the time they were doing it.

Mr. SPRATT. About how many years ago was that?

Capt. MALLAN. I have forgotten.

Mr. VAN KENNEN. Give us the best of your judgment.

Capt. MALLAN. It would be 20 years or more.

Mr. VAN KENNEN. Prior to that time do you remember the depth?

Capt. MALLAN. In the old canal?

Mr. VAN KENNEN. Yes.

Capt. MALLAN. At that time I have seen them when we could not get over the sill at 9 feet. We used to have to get way back and get a run to get over the sill. Many times the tug would have to go outside and let the tow go through by herself.

Mr. VAN KENNEN. Your recollection is that it was something like 20 years ago that there was a change of depth made there to its present depth?

Capt. MALLAN. Yes, sir.

Mr. KING. The three critical points that we talk of are the head of the Morrisburg Canal, the Pitch, so-called, and Canada Island. Is that your idea, captain?

Capt. MALLAN. I am here to figure on the dam. Of course, anything outside of that I do not know anything about.

Mr. KING. What do you mean by that; that the dam is the only thing you have been coached on?

Capt. MALLAN. No.

Mr. VAN KENNEN. I object to that.

Mr. KING. Do you object to my asking questions about that?

Capt. MALLAN. I do not know anything about it. I am not here to answer anything I do not know about.

Mr. KING. Will you allow me to ask you a question or two about the rapids, in a friendly spirit?

Capt. MALLAN. Yes.

Mr. KING. Do you agree with the previous witness, Capt. Daly, as to the method taken in entering the head of the Morrisburg Canal with a freighter?

Capt. MALLAN. In what way?

Mr. KING. As to having to round to upstream, or run your nose on the bank, or come around some way so as to come stern down?

Capt. MALLAN. Yes.

Mr. KING. And you think very few others have taken a tow into the head of the Morrisburg Canal?

Capt. MALLAN. I do not think there are very few others but I think I was the first one to tow in there for the M. T. Co.

Mr. KING. And you do not make a practice of it? You have a strong preference for going outside?

Capt. MALLAN. Yes, sir.

Mr. KING. In going down outside perhaps your greatest difficulty with the tow is at the Pitch?

Capt. MALLAN. The Millpitch?

Mr. KING. No; not the Millpitch; the Pitch over the Hog's Back, what you call the cellar.

Capt. MALLAN. Yes.

Mr. KING. That is what you dislike most, is it not?

Capt. MALLAN. Yes.

Mr. KING. Your barges tend to swing on their line one side or the other, probably to the north?

Capt. MALLAN. It is not so much about their swinging on their lines. In high water we never take any consideration of that.

Mr. KING. If it is reasonably low there is a chance of their striking somewhere?

Capt. MALLAN. Yes.

Mr. KING. And you are never sure where they are going to strike?

Capt. MALLAN. Yes; in the swell. As a rule, they do not hit anywhere except right there.

Mr. KING. Do you know whether it is on the edge of the Hog's Back, or what it is?

Capt. MALLAN. No; I do not know what is there.

Mr. KING. You do not know whether there are bowlders there?

Capt. MALLAN. No.

Mr. KING. But you have had a great number of cases of their hitting?

Capt. MALLAN. Yes.

Mr. KING. And those are things you could not avoid?

Capt. MALLAN. No; we could not avoid them.

Mr. KING. It is one of the difficulties of the point?

Capt. MALLAN. Yes.

Mr. KING. And you expect the embankment between Canada Island and Ogden Island to get over that trouble because of its backwater effect?

Capt. MALLAN. Yes, sir.

Mr. KING. And in forming that conclusion you took no account of the 30,000 cubic feet drawn into the Little River?

Capt. MALLAN. No.

Mr. KING. That would not make any difference?

Capt. MALLAN. No.

Mr. KING. Have you known a boat to go on the shoal between Canada Island and Ogden Island?

Capt. MALLAN. Yes, sir.

Mr. KING. Through any other reason than some disarrangement of her motive or steering gear or a broken towline?

Capt. MALLAN. To an accident? No; I do not know of any other reason for a boat going in except that of accident.

Mr. KING. An accident to either the power or the steering of the tug or the breaking of a line?

Capt. MALLAN. Certainly.

Mr. KING. The side draft has never been sufficient to draw a boat in against the power of her gear?

Capt. MALLAN. With a barge it has.

Mr. KING. Have you seen a barge go on there without an accident or where the line has not been broken?

Capt. MALLAN. No; but I have known them to touch Canada Island.

Mr. KING. I suppose if a pilot did not hold up enough to the north he woud hit there?

Capt. MALLAN. If the wind is blowing to the north pretty heavily it is difficult.

Mr. KING. And if in fighting the bank he did not keep up far enough he would touch?

Capt. MALLAN. Yes. Sometimes you are loaded so heavy you can not hold far enough. I went down there with four barges. I have taken two and I have taken three down.

Mr. KING. I suppose three is a fair load, is it not?

Capt. MALLAN. Yes.

Mr. KING. And on a short line?

Capt. MALLAN. It is an ordinary line.

Mr. KING. And with your nose well up toward the bank your barges would not be close to Canada Island?

Capt. MALLAN. Yes.

Mr. KING. Is that a half-mile course there?

Capt. MALLAN. I guess it would be.

Mr. KING. Have you seen any boats ashore or on the bottom at the foot of Lake St. Louis in what they call the dredged cut?

Capt. MALLAN. Yes, sir.

Mr. KING. Quite a lot of them? There is a fairly narrow cut there with some cross current?

Capt. MALLAN. Yes, sir.

Mr. KING. You would not like to call that the graveyard of the St. Lawrence, would you?

Capt. MALLAN. No. They have more sea room in there.

Mr. KING. In the actual channel?

Capt. MALLAN. Yes.

Mr. KING. That is measured in feet and yards, is it not, the actual channel between the stakes?

Capt. MALLAN. Yes.

Mr. KING. There is no half-mile width between the stakes there?

Capt. MALLAN. No.

Mr. KING. And every year are there not some boats that touch there or take bottom?

Capt. MALLAN. Not if they are in the channel.

Mr. KING. But if something happens, they do?

Capt. MALLAN. Certainly.

Mr. KING. Is it not a fact that below Farrans Point boats go down sidewise?

Capt. MALLAN. Not that I know of. It is a funny proposition to think of that because we have to do down there according to the way the current is working.

Mr. KING. If it is not working the way you like, how do you go down?

Capt. MALLAN. Any way we can get down.

Mr. KING. Stern first?

Capt. MALLAN. Yes. Sometimes we can drift down. At other times it is a hard proposition.

Mr. KING. And it takes a great deal of experience for a pilot to get over them all?

Capt. MALLAN. Considerable experience.

Mr. KING. You have had some experience in the stretch through the Rapide Plat?

Capt. MALLAN. Yes, sir.

Mr. KING. With tugs?

Capt. MALLAN. Yes, sir.

Mr. KING. How many tugs have you taken up there?

Capt. MALLAN. I have taken up the *Mary;* that is about all.

Mr. KING. That is the boat you were running for the M. T. Co.?

Capt. MALLAN. Yes, sir.

Mr. KING. If the canal were closed it would facilitate getting up outside?

Capt. MALLAN. Yes.

Mr. KING. And it is not a very difficult thing for the tug to go up outside?

Capt. MALLAN. Yes; at the Millpitch it is. It is not at any other place.

Mr. KING. This is the first time you have mentioned the Millpitch. Where is that?

Capt. MALLAN. The Millpitch is on the towpath side.

Mr. KING. Is it not a fact that you go upstream as much as possible in the eddy or slack water rather than in the main current of the stream?

Capt. MALLAN. Certainly. If we can not get slack water we go out in the current.

Mr. KING. But where you can do so you cross the main stream and get into the slack water?

Capt. MALLAN. Certainly.

Mr. KING. Do you think you could take any of your tugs up the whole way, stemming the current?

Capt. MALLAN. We could from Morrisburg Lock up to what we call the "swells," but we could not go up any farther.

Mr. KING. You could not go up the Rapide Plat at Crapser's Dock?

Capt. MALLAN. No.

Mr. KING. Have you had any experience yourself of taking the eddy or slack water on the south side and then holding over through the Boilers in an effort to get the eddy on the north side, and failing to make it and having to do it over again?

Capt. MALLAN. Where?

Mr. KING. In the rapids?

Capt. MALLAN. Yes.

Mr. KING. If by any chance your currents were increased or your depths were decreased your difficulties would be that much greater?

Capt. MALLAN. In what way do you mean?

Mr. KING. Well, I should not say that much greater; I should say would be greater.

Capt. MALLAN. I do not quite understand you.

Mr. KING. Well, I will not press that.

Mr. POWELL. Capt. Mallan, I understand you to say that it is a pretty difficult job to go down with a tow, especially if you have two or three barges. In the first place, there is the rapid current; in the second place, you have to keep a good headway, and that makes you cross the bottom at a rapid rate; and then, in addition to that the fact that you have your barges on a long towing hauser causes them to sheer?

Capt. MALLAN. Yes, sir.

Mr. POWELL. And you have to be on the alert all the time?

Capt. MALLAN. Yes, sir.

Mr. POWELL. And you have not much time to think because you have to get to your point instantly?

Capt. MALLAN. Yes, sir.

Mr. POWELL. And it is about as dangerous an operation as you have in shipping, to run the rapids with two or three barges?

Capt. MALLAN. Yes, sir; it is.

(The commission thereupon at 1 o'clock p. m. took a recess until 2.30 p. m.)

FRANK N. CLEAVELAND, sworn, following the recess.

Mr. VAN KENNEN. I wish to introduce in evidence a grant from the State of New York to Mr. John Taylor, bearing date November 15, 1787, granting to Taylor certain properties belonging to this company at this time on the shore of this Waddington power plant.

Mr. MIGNAULT. Does that grant carry water rights?

Mr. VAN KENNEN. These grants carry all the land to the margin of the stream. By that I take it that two interpretations might be given. The ordinary interpretation on a nonnavigable stream would be that it went to the thread of the stream.

Mr. MIGNAULT. You need not elaborate the point now; it is a matter of argument.

(Deed filed as Exhibit A–36.)

Mr. VAN KENNEN. I ask leave to hold this exhibit for the purpose of getting an extra certified copy which I was not able to get before I came here.

I also introduce another grant by the State of New York to John Taylor, bearing date the same day, November 15, 1787, also granting a tract of land at the same point. (Deed filed as Exhibit A–37.)

I also wish to introduce in evidence a further grant by the people of the State of New York to John Taylor, bearing the same date, granting another separate section of the same property. (Deed filed as Exhibit A–38.)

I wish to offer in evidence a further grant from the State of New York to Alexander Macomb, bearing date December 17, 1787, granting a certain section of the same land adjacent. (Deed filed as Exhibit A–39.)

I also wish to introduce in evidence a grant from the State of New York to Jeremiah Rensselaer, bearing date May 5, 1788, being a grant of another parcel of land of the so-called water power property. (Filed as Exhibit A–40.)

I also wish to introduce a deed of the State of New York to Daniel McCormick, dated August 6, 1814, which grants to McCormick Ogden Island. (Filed as Exhibit A–41.)

I also in connection therewith desire to introduce a map showing the subdivisions of the townships to which these grants relate, including the island. It is a copy of an old map. (Filed as Exhibit A–42.)

I will ask Mr. Cleaveland where he resides.

Mr. CLEAVELAND. In Canton, N. Y.

Mr. VAN KENNEN. What has been your business principally during your active life?

Mr. CLEAVELAND. Examining titles.

Mr. VAN KENNEN. Have you examined the titles to this property in the deeds to the New York & Ontario Power Co.?

Mr. CLEAVELAND. I have.

Mr. VAN KENNEN. I refer now particularly to the Exhibit No. 3, the deed from Allison to the New York & Ontario Power Co. In connection with the abstract of title of that property, did you examine and find the map that has been introduced as Exhibit A–42?

Mr. CLEAVELAND. I found the original map that was filed in the county clerk's office by the surveyor general of the State, and this map is a reproduction from that one.

Mr. VAN KENNEN. And has it been made accurately by you?

Mr. CLEAVELAND. Yes.

Mr. POWELL. How long was it filed there?

Mr. CLEAVELAND. More than 40 years; I knew of it 40 years ago.

Mr. MIGNAULT. What is the date of that map?

Mr. CLEAVELAND. About 1787.

Mr. VAN KENNEN. Have you made an examination of the title sufficient to show whether the lands granted by Exhibits 36 to 41 inclusive, together with the water rights, and the acts of the legislature, have come down to the New York & Ontario Power Co.?

Mr. CLEAVELAND. So much of them as are included in this deed. Of course, these grants contain more land than is in that deed.

Mr. VAN KENNEN. But the parts covered by the deed, Exhibit 3, have come from the original grantees, together with the water rights connected therewith to the New York & Ontario Power Co., as covered by deed Exhibit No. 3.

Mr. CLEAVELAND. Yes.

Mr. VAN KENNEN. I think, Mr. Cleaveland, that we should put on the record, taking these grants, the various lots that were granted thereby; can you do that?

Mr. CLEAVELAND. Yes.

Mr. VAN KENNEN. Now, I show you Exhibit No. A–36.

Mr. POWELL. You have no abstract of title?

Mr. VAN KENNEN. No.

Mr. POWELL. It would take much less time if you had.

Mr. VAN KENNEN. I have tried to get it complete, but it is very difficult.

Mr. POWELL. It would not take one-tenth of the time that it would take this way.

Mr. MCLEAN. May I ask a question of Mr. Van Kennen, which I think is pertinent to this question of title. Mr. Van Kennen, by your offer of these grants and maps, are you asserting any title to the water rights or to the bed of the Little River other than as set out in your pleadings or application as filed?

Mr. VAN KENNEN. I think probably not. However, I want to say in connection with that that the grant of the legislature in 1826, by the State of New York, granted to our predecessors in title all that land in the bed of the stream from the dam down to the navigable waters of that stream.

Mr. MCLEAN. That act, of course, speaks for itself and we can interpret that before the commission later, but my question was directed to these grants that you are speaking of now, whether or not any of these grants asserted any additional or other title than the title given by the statute to the bed of the river, or to any water rights in the Little River.

Mr. VAN KENNEN. I am speaking now with reference to the statute of 1808.

Mr. MCLEAN. I am not referring to the statute. I am only referring to these grants that you offered here just now.

Mr. VAN KENNEN. I think, perhaps, there is a legal question involved in that which I do not care to waive. I do not claim anything more than is given by the original grant, plus the legislation.

Mr. MIGNAULT. And as to the effect of the grants themselves, do they purport to convey any water rights to the grantees?

Mr. VAN KENNEN. No, sir; they do not; they speak for themselves upon that point. As far as the nature of the grant is concerned, if they have acquired any water rights by virtue of the grant, it must have been from the grant itself, which is a legal question.

Mr. MIGNAULT. But no water rights are covered by the grant.

Mr. VAN KENNEN. Except as a matter of law, as I take it. Possibly the first grant to Mr. Taylor, that I have referred to, gave a grant to lot 14 on the St. Lawrence River.

Mr. MCLEAN. I may say here that in filing the answer on behalf of the State of New York, we did not raise any question or intend to raise any question with respect to the title of this applicant to the upland. The only question we did raise was a question of their title to the water rights of the Little River and the bed of the stream there. I might simplify matters, Mr. Van Kennen, by saying that we do not raise any question with regard to your title to the upland.

Mr. VAN KENNEN. That is all right; I thoroughly understand you. But at the same time we are putting these in for the purpose of giving us such rights as a riparian owner would have in this stream, whatever they may be under the law.

Mr. MCLEAN. I do not want you to feel that we are placing on you the burden of encumbering the record with all these deeds.

Mr. MIGNAULT. This map shows the township in which Waddington is situated?

Mr. VAN KENNEN. Yes.

Mr. MIGNAULT. And the lots run pretty consecutively from No. 1 to No. 95?

Mr. VAN KENNEN. Yes; and these grants we are speaking about cover the whole section.

Now, Mr. Cleaveland, Exhibit A–36 grants lot 14.

Mr. CLEAVELAND. Yes; that is 14 on the river.

Mr. VAN KENNEN. What is Exhibit A–37?

Mr. CLEAVELAND. Lot 15.

Mr. VAN KENNEN. What is Exhibit A–38?

Mr. CLEAVELAND. Lot 16.

Mr. VAN KENNEN. What is Exhibit A–39?

Mr. CLEAVELAND. Lot 7.

Mr. VAN KENNEN. What is Exhibit A–40?

Mr. CLEAVELAND. Lots No. 1 to 6, inclusive.

Mr. VAN KENNEN. What is Exhibit A–41?

Mr. CLEAVELAND. That is the island.

Mr. MIGNAULT. Have you nothing for lot No. 17?

Mr. CLEAVELAND. Exhibit No. 38 covers lots 16 and 17.

Mr. MIGNAULT. That gives you the whole river front from lot 1 to lot 14, inclusive?

Mr. VAN KENNEN. Yes; it takes all the river front abreast of the south shore opposite the island, and considerably above.

Mr. MIGNAULT. What is the size of these lots?

Mr. CLEAVELAND. Five hundred acres.

Mr. POWELL. What about that limitation of time in the statute?

Mr. VAN KENNEN. That is a question of law; we hold one view and they may take another.

Mr. MIGNAULT. Mr. Van Kennen, have you nothing to show how these titles came down from the original grantees to your company?

Mr. VAN KENNEN. Not in the form of an abstract. Mr. Cleaveland has made and I thought we would be able to get an abstract from the trustee under the mortgage, but at the last moment they advised me they had none, and therefore, I brought Mr. Cleaveland over here to make this abstract and to follow this down, and he now has testified that it has fallen into our ownership.

Mr. MIGNAULT. That is the only way in which you purpose to trace the title down from the original grantees to your company?

Mr. VAN KENNEN. I am doing that by this witness.

Mr. MIGNAULT. Of course, you appreciate that there is a better way of tracing the title.

Mr. VAN KENNEN. I understand that if strict rules were applied we would have to have the abstract title from the beginning down to the present time.

Mr. SPRATT. It would cost $1,500 to do that.

Mr. MIGNAULT. Have there been many transfers or mutations of title?

Mr. CLEAVELAND. Yes, there have been a great many; more than 200.

Mr. MIGNAULT. Is that 200 in the aggregate or to each of these lots?

Mr. CLEAVELAND. Altogether there were more than 200 transfers of title.

Mr. POWELL. They all appear by the records.

Mr. CLEAVELAND. Yes, I examined this title for the purchasers.

Mr. VAN KENNEN. Mr. Cleaveland, you have examined all of these grants that have been offered here?

Mr. CLEAVELAND. Yes.

Mr. VAN KENNEN. Are you personally familiar with their terms?

Mr. CLEAVELAND. Yes.

Mr. VAN KENNEN. Do any of them purport to grant any part of the bed of the Little River?

Mr. CLEAVELAND. They do not.

Mr. VAN KENNEN. Do any of them purport to grant any water rights in the Little River?

Mr. CLEAVELAND. Not in terms, no.

Mr. VAN KENNEN. And when you say "not in terms" you mean they grant no other rights than they may receive as riparian owners to the Little River?

Mr. CLEAVELAND. Exactly.

Mr. MIGNAULT. The land is merely described as abutting on the Little River.

Mr. CLEAVELAND. It is.

Mr. POWELL. Are you people all agreed upon the law point? In the first place who owns the bed? Who, in common law, according to the decision of your courts, would own the bed of that channel?

Mr. VAN KENNEN. I presume we may not be agreed upon that particular point and therefore I think we have all the facts upon which we can predicate an argument, as to whether the bed of that stream came to us by virtue of these grants or not. The facts are all before us, I think.

Mr. MIGNAULT. You will address yourselves in your argument to that, and deal with that question.

Mr. VAN KENNEN. I certainly shall, when the time comes.

Mr. POWELL. Unquestionably before the secession, they were in the hands of the King of England as representing the sovereign power in the State. Now, when he gives the grant, was the assumption that it went to the center of the stream or that it stopped at high-water mark?

Mr. VAN KENNEN. In the nonnavigable streams I understand the rule to be that the grant of the stream went to the center of the stream. Now with reference to international border waters, possibly this may be interpreted differently but we have no decision on that point.

Mr. POWELL. Some of your States draw a distinction. In England the distinction is between tidal waters and nontidal waters. Tidal waters is a navigable stream, and nontidal is not. That was adopted in some of your States; I understand it was adopted in the State of New York.

Mr. VAN KENNEN. It was adopted in the State of New York, but it has been very greatly extended. I mean this, that the definition of a navigable stream, under the law of the State of New York, as I understand it, is not confined to tidal waters, but it is confined to what we call navigable waters.

Mr. POWELL. When they made that change, is it a mere change in nomenclature or did they accompany the change by right or presumption in law?

Mr. VAN KENNEN. I think it is a change in right.

Mr. POWELL. I wish you gentlemen could agree on that because it would be a very intricate question for us to work on.

Mr. MCLEAN. That is the whole issue, so far as the State of New York is concerned.

Mr. POWELL. The State of New York advances the ground that in the absence of a specific grant it remains in the State; that is your ground.

Mr. MIGNAULT. Their courts have held that.

Mr. POWELL. The courts have been holding both ways.

Mr. VAN KENNEN. They certainly have.

Mr. MCLEAN. It is very difficult to answer your question, Mr. Powell, yes or no as you put it. I think Mr. Van Kennen and I are prepared to present to you our views on this question when the proper time comes.

Mr. VAN KENNEN. If it would be of any service I would be glad to say that in some sections of the international border water, the courts I believe held, and I think it would be considered the law of the State of New York at the present time, that the bed of the stream belongs to the State. Whether that is applicable to this particular section of the river, or the definition of navigability, is a very different question.

Mr. MIGNAULT. There was a decision by one of your courts with regard to the Long Sault Development Co. in which they held that the bed of the St. Lawrence River was in the State of New York, and did not go with the title to the riparian lands.

Mr. VAN KENNEN. I am very familiar with that, although the facts are somewhat different here and that might make a difference in the interpretation of the law.

Mr. POWELL. That case, to my mind, was not conclusive.

Mr. VAN KENNEN. The trouble there was that it was beyond all question a navigable stream in fact. This is not a navigable stream, in fact, necessarily.

Mr. MIGNAULT. That is your case.

Mr. VAN KENNEN. That is our case. I would like to call Mr. Lea a moment for one question.

(The witness was discharged.)

R. S. LEA, consulting engineer, recalled.

Mr. VAN KENNEN. There seems to be a confusion with regard to one point of Mr. Lea's testimony in regard to what he said about the effect of the embankment raising the water over the crest of what he called the Hog's Back, which has also been called the Pitch. There certainly is a confusion in my mind, and I think possibly in the minds of some of the commissioners, judging at least from the

questions they have put to counsel. It is clear there is a confusion between my mind and the mind of counsel representing the Dominion Marine Association, rather than that we are at cross-purposes. I would have that explained by Mr. Lea, and I have called him for that purpose.

Mr. LEA. I have not had an opportunity of reading what I said yesterday, but I understood from the questions of Mr. King that he understood me to say that the backwater effect of the embankment between Ogden Island and Canada Island, in the way of drowning out pitches and cellars and other disturbances in the water, amounted to from 3 to 6 inches.

Mr. KING. My interpretation expressed this morning in cross-examination was that you had said that when the stage of the river indicated by the gauge at Cardinal or at Lock 24 at the head of the Morrisburg Canal——

Mr. LEA. At Cardinal?

Mr. KING. Yes, at Cardinal. My interpretation was that you had suggested that when the stage of the river indicated at the gauge at Cardinal was 16.1 feet, corresponding to the flow of 222,500 c. f. s. you would, by your proposed works—that is, by the embankment from Ogden Island to Canada Island, combined with the proposed withdrawal of 30,000 c. f. s. in the Little River, give us from 3 to 5 inches more water on the Hog's Back than under existing conditions.

Mr. LEA. Yes, I said that. But I understood you to say also, when you were cross-examining the pilot, that this backwater effect of 3 inches to 5 inches would have, on the drowning out of the cellars——

Mr. KING. Quite true.

Mr. LEA. I want to explain that. You see when we withdraw 30,000 c. f. s. from the river, at the entrance of the Little River, there is that much less going down the main river, so that we are forced by our embankment to correct the fall in water due to that diversion, and that amounts to 1.6 feet in difference. So that when we add the 3 inches to the 1.5 feet or 1.6 feet I mention, we are really raising the water flowing down the Rapide Plat about 2 feet, and this drowning out effect on the cellar at the Pitch is 2 feet; it is from 1.9 feet to 2 feet 2 instead of the few inches mentioned. Let me add. We not only deepen the water to as much as it was before, when there were nearly 222,000 c. f. s. flowing down the main river, all but what is now flowing down the Little River, which is all but 3,000 c. f. s. We not only maintain the level with the diminished flow, but we are raising it from 3 to 5 inches in addition. And in doing that we decrease the fall in the rapids, between the head of the rapids and the foot of Ogden Island from a little over 9 feet to less than 7 feet. The drowning out effect is not on the 222,500 c. f. s., but it is on the 222,500 c. f. s. minus 27,000 c. f. s., which is about 195,000 c. f. s. The total rise in water that we must create at the Hog's Back there, in order to compensate for the diversion of the water, and more than compensate, is relative to the water which is now flowing down about 2 feet or a little over, and it is probable, and, in my opinion, it will have a very considerable effect and possibly a complete drowning out of the swells and the pitch on the cellars.

Mr. KING. I understood you, Mr. Lea, to agree with my quotation of your evidence yesterday.

Mr. LEA. Yes.

Mr. KING. About that 3 to 5 inches which you promised us.

Mr. LEA. Yes; and which you can determine any time by comparing the gauge reading there with the gauge reading at Cardinal.

Mr. KING. You say that is from 3 to 5 inches additional depth of water at the Hogs Back over conditions to-day.

Mr. LEA. With the same flow as to-day.

Mr. MAGRATH. After withdrawing the 30,000 c. f. s.

Mr. KING. No; over existing conditions as we would find if we went up the river at the present moment.

Mr. LEA. I agree with that.

Mr. KING. Then you add to that in explanation that there would be a variation from the conditions existing at the present moment by reason of the increased withdrawal down the Little River.

Mr. LEA. By reason of the fact that instead of 222,500 c. f. s. flowing down the main river, with that depth of water there, there would be only about 195,000 c. f. s. flowing down.

Mr. KING. Did I not state that correctly when I said that the difference would be due to the increased withdrawal down the Little River. The difference you contemplate in the decrease of level is the proposed withdrawal down the Little River.

Mr. LEA. We make that good, which is about 1.6 feet, and from 3 to 6 inches besides.

Mr. KING. You did suggest, after the agreement which we reached as to your quotation yesterday, that there would be a reduction in depth of water compared with existing conditions, and that that reduction would be due to your proposed additional withdrawal down the Little River, and that you would meet that by the building of an embankment between Canada Island and Ogden Island, which would make good the 1 foot 6 inches of decrease and add 3 to 5 inches additional to that.

Mr. LEA. That is true.

Mr. KING. Then I correctly understand you in my interpretation that the 2 feet so-called addition to the Hogs Back is 2 feet over the depth that would exist once 30,000 c. f. s. go down the Little River.

Mr. LEA. Yes.

Mr. KING. We understand each other—not over existing conditions.

Mr. LEA. No.

Mr. MIGNAULT. In other words, if you take out 30,000 c. f. s. in the Little River, without building the embankment between Ogden Island and Canada Island, you have a reduction, roughly, of 1.6 feet, and by the construction of the embankment you not only wipe out that 1.6 feet, but you add from 3 to 6 inches, so that, as the net result, the height of the water at the Hogs Back would be from 3 to 5 inches higher than it is to-day.

Mr. LEA. That is right, sir, so far as levels are concerned; but what I am concerned with is the drowning out effect. If we were to divert the 30,000 c. f. s. out of the river altogether, the fall in level in the Rapide Plat all the way down from top to bottom would be about 1.6 feet and we would have our pitch and swells on Hogs Back

just the same as we had before we diverted it, because the levels from top to bottom of the rapids rise and fall parallel to this with the increase or decrease in the quantity of water flowing through. So that you see, when we divert our 30,000 c. f. s. we have 27,000 c. f. s. less flowing down the Rapide Plat, and the pitch and the swells and the cellar would be about the same as usual. Now, in order to restore the water 1.6 feet——

Mr. MAGRATH. Is it true to say that you would have the same conditions, would you not have your pitches intensified?

Mr. LEA. Not noticeably. We have 14 or 15 gauges at different points on the rapids, and they rise and fall together. I imagine there would be a slight increase in the pitch; I do not know what it would amount to, but at any rate it is not very different from what we would have before we diverted the water. That is, we would have the conditions there about the same, but less water would be flowing down. Now, in order to restore the levels to the point Mr. King agrees with me, I said we would have 1.6 feet plus from 3 to 6 inches; and we would, in effect, drown out the pitch and the cellar and the swells by that much, and not by only 3 inches.

Mr. KEEFER. That is all premised upon 222,500 c. f. s. going down the river.

Mr. LEA. You could say it is premised on that.

Mr. KEEFER. What would be the variation when there is only 194,000 c. f. s. or the low-water stage of the river?

Mr. LEA. In my opinion, if it ever got down to 194,000 c. f. s., or the lowest stage of the water, and we diverted 30,000 c. f. s. we would not quite maintain what we might call the normal level which should occur there before our diversion.

Mr. KEEFER. What would be the differences at that Hogs Back?

Mr. LEA. Perhaps an inch.

Mr. KEEFER. Only an inch?

Mr. LEA. I am not sure that it would be anything, but it might be something about that.

Mr. KEEFER. Your proposition means that you can take the water out of the river and get it back without putting it back.

Mr. LEA. Not get the water back but get the level back.

Mr. KEEFER. You stated that at 222,500 c. f. s. by putting in a dam from Canada Island to Ogden Island with the 30,000 c. f. s. taken out of the river you would get the normal conditions back.

Mr. LEA. Yes.

Mr. KEEFER. Now, then, when you start out with the premise of only 194,000 c. f. s. or 14 feet on the sill, you say you would still hold it within 1 inch?

Mr. LEA. Within 1 inch of what it is to-day.

Mr. KEEFER. What would it be with 16 feet on the level?

Mr. LEA. It would be at that stage of the river 1 inch of what it would be at 194,000 c. f. s.

Mr. KEEFER. What depth of water would you have at the Hogs Back under these conditions?

Mr. LEA. I do not know what level they would have, but I say it would be within 1 inch of what it would be if we were not in the river at all. It was only down to 194,000 c. f. s. one month out of the whole time since 1860, and if our gauges showed that we were

interfering to that extent of 1 inch, which they would, there is nothing to prevent the International Joint Commission, or whoever is controlling that work, ordering us to take 25,000 c. f. s. during that particular month, which would be a very small fraction of 1 per cent of the time.

Mr. KEEFER. Don't you think it would be better to make sure of navigation first?

Mr. LEA. No, because we have a power that would not be interfered with except for perhaps 1 month in 700 months, and there is not one power in a thousand that anything like that can be said about.

Mr. KEEFER. But at other times when the water would come down not quite so low, there would be the same relative difficulty?

Mr. LEA. No. Down to about 200,000 c. f. s. we would still be able to maintain the elevations as they are to-day; that is, without any interference whatever.

Mr. KEEFER. What would 200,000 c. f. s. give you at Lock 24? If 222,500 gives 16, what would 200,000 give?

Mr. LEA. The depth on the sill then would be 14.74 feet.

Mr. KEEFER. Would you have the same relative stage at the Hogs Back as you have when you have 16 feet?

Mr. LEA. Not at Lock 24; 16 feet at Lock 28.

Mr. KEEFER. What is it at Lock 24?

Mr. LEA. With no disturbance it is about the same. If we begin to disturb it we lower it at Lock 24. We do not pretend that we are not lowering it at Lock 24, but we do not lower it so as to interfere with navigation.

Mr. MIGNAULT. Could you show graphically when you contend now by profiles of the water surface under present conditions and under the conditions that would be created by the abstraction of the 30,000 second-feet in the Little River and the construction of the embankment between Ogden Island and Canada Island?

Mr. LEA. Yes, sir. You want a profile of the river as it is before we disturb it and afterwards with the compensation works in?

Mr. MIGNAULT. Yes.

Mr. LEA. We can furnish that.

Mr. MIGNAULT. What I have in mind now is a profile showing the present water surface with this pitch or cellar indicated and the water surface after the construction of the proposed embankment. I think that might graphically show whether you are right or wrong in your present contention.

Mr. POWELL. Am I right in this, Mr. Lea. That there are three influences or forces there? First, you have the influence of increased water coming down the river; secondly, you have the effect of the decreased water owing to the withdrawal through the south channel; and, thirdly, you have the elevating effect, which you might call a positive influence, of the erection of the dyke below. If I understand you correctly, the withdrawal of the 30,000 cubic feet per second simply lowers your profile line until your new line is substantially parallel to the old one?

Mr. LEA. Yes.

Mr. MAGRATH. That is a thing I can not subscribe to.

Mr. LEA. I will explain that. We have the readings over many years at Locks 23 and 24, one of which is at the foot of the rapids and

one is at the upper end. As the river increases and discharges from low water, say from 200 cubic feet per second up to 300,000 cubic feet per second, the river rises at both gauges and it rises practically the same in both cases. Ordinarily those gauges are the only gauges one has on the river, that is, lock gauges; but, as I explained in my evidence yesterday, for other reasons we put in 8 or 10 intermediate gauges in the rapids, so we have also the records of those to compare; and the profile of the rapids at low water is just about the same as it is at 1 foot, 2 feet, or 3 feet higher.

Mr. MAGRATH. Suppose you increase the volume of that river. Do you mean to say that the surface of that water is going to remain parallel at separate elevations in the river?

Mr. LEA. Yes, sir; that is characteristic of the St. Lawrence River and not of any other river. The reason for that is that the St. Lawrence River has such an extremely small variation in flow.

Mr. MAGRATH. On account of its heavy reservoir capacity?

Mr. LEA. Yes; its minimum is even greater than half its maximum. The rise and fall all together over 60 years in most places is from 5 to 6 feet; and so when it rises or falls it does not spread out over the bank, which would alter the slope, but it simply rises like it would in a canal.

Mr. MAGRATH. And your gauges at various points in those rapids indicate the parallelism?

Mr. LEA. Yes, sir. That is true, not only in the Rapids Plat, but in other rapids in the river.

Mr. POWELL. The effect, then of the withdrawal of 10,000, 20,000, 30,000, or any other quantity, would be that it would lower on parallel lines the profile of the river?

Mr. LEA. That would be true if we diverted it out of the river altogether, but in our case we return it at the lower end, so we do not lower it there at all. That is going to make some difference itself. We start correcting the effect of withdrawal at once by returning the water.

Mr. POWELL. The effect of that withdrawal above would be substantially to make a difference of profile simply on parallel lines?

Mr. LEA. Yes; if we took the water away altogether.

Mr. POWELL. The second influence is the returned water below, which has the effect of creating backwater, and would vary that condition to a certain extent?

Mr. LEA. Yes.

Mr. POWELL. Now, the third influence is the effect of your dam.

Mr. LEA. Which combined with the other has the effect which I have described.

Mr. POWELL. But that has the effect also of backing the water up.

Mr. LEA. Yes, sir.

Mr. POWELL. And you say that the result of that dam below would counteract and raise the profile of the river sufficiently to drown out, and the two levels above and below the fall relative to each other would be disturbed?

Mr. LEA. Yes; of course.

Mr. MIGNAULT. If you built a dam in the river you would establish practically the same elevation from Lake Ontario down to the dam?

Mr. LEA. As a matter of fact, that river is so narrow you could not do that.

Mr. MIGNAULT. That would drown out in the rapids or in the fall from the dam up to Lake Ontario?

Mr. LEA. Yes, sir.

Mr. MIGNAULT. And you produce a lesser effect here by putting in your embankment, which backs up the water, and, so far as it goes, gives you approximately a straight profile line, which drowns out anything in the inclined profile line which it covers?

Mr. LEA. Yes, sir; and that inclined profile line is, of course, flatter than the original one. This Hog's Back occurs in that region and is drowned out to the extent of 2 feet.

Mr. MIGNAULT. I do not follow you with reference to the 2 feet. Supposing you did not put the embankment there at all and took out the 30,000 cubic feet per second? You have 1.6 of a reduction of profile, which would be a parallel profile; but by the backwater effect you not only counteract that, but your backwater extends so that at the point of the Hog's Back you have a profile line higher by 3 to 5 inches than the water surface before.

Mr. LEA. Yes; and that higher profile line by that amount is with 195,000 second-feet flowing against 222,000 flowing. So you see the effect of that rise must be taken into account and the diminution of quantity as well.

Mr. MIGNAULT. Yes; but this all depends on the stage of the river, anyway?

Mr. LEA. No; it simply means that we are taking a smaller quantity down, so we are going to drown out the swells.

Mr. POWELL. When you speak of those 2 feet you mean the raise down at the foot, and that extends along until away up it gives you about 3 inches difference?

Mr. LEA. No; I mean that we divert the water, as you say, lowering the profile parallel to itself 1.6 feet, and then we return the water at the foot of the island. That would have some backwater effect, and we would add to that by the backwater effect of the embankment. We are then able to increase the level of this profile which we have depressed 1.6 feet at the Hog's Back so much that we recover the 1.6 feet and from 3 to 6 inches more and with diminished flow down that channel. We are sending down 195,000 second-feet.

Mr. POWELL. What would be the increase in the height of water at this dike?

Mr. LEA. It would be about 3½ feet.

Mr. POWELL. And it would level the water from 3½ to 5 or 6 inches on the shoal?

Mr. LEA. It would be reduced up there to 2 feet. When you get up to Lock 24 it is about 8 or 10 inches.

Mr. TAWNEY. Mr. Lea, referring to the question asked you a few moments ago by Mr. Keefer with respect to the effect upon the interests of navigation by diverting 30,000 second-feet of the water of the St. Lawrence River down through the Little River when the aggregate of the river was 194,000 second-feet; I want to ask you if you are acquainted with conditions under which the approval of this commission was granted for the construction in the St. Lawrence River at the outlet of Lake Superior?

Mr. LEA. Yes, sir; I have read them and am fairly familiar with them.

Mr. TAWNEY. You are aware, are you not, that the obstructions at the outlet of Lake Superior involve much greater engineering problems than any that are involved in this case before us?

Mr. LEA. Yes, sir.

Mr. TAWNEY. The interests of navigation were more directly affected than they would be here?

Mr. LEA. Yes; the diversion there is 60,000 second-feet out of 80,000.

Mr. TAWNEY. And the compensation works at the outlet of Lake Superior were proposed then to be built with a view of controlling the level of Lake Superior, a body of water 33,000 square miles in extent within a minimum range of 18 inches?

Mr. LEA. Yes, sir.

Mr. TAWNEY. If the commission should approve of this application, in your judgment would such approval, if made upon similar conditions, fully and amply protect the interests of navigation?

Mr. LEA. Yes; and very much more easily.

Mr. TAWNEY. I call your attention to one of the conditions in that particular case, which was the most important one from the standpoint of navigation as well as from the standpoint of engineering that this commission has considered and passed upon.

All compensation works heretofore built and all such works built under this order of approval and all power canals, including their headgates and by-passes, shall be so operated as to maintain the level of Lake Superior as nearly as may be between the levels of 602.1 and 603.6 above said mean tide at New York and in such manner as not to interfere with navigation. The operation of all the said works, canals, headgates, and by-passes for the above purposes shall be under the direct control of a board hereinafter authorized, which board shall be known as the "board of control."

With approval under similar conditions of international control, in your judgment, would there be any likelihood of the construction and operation of these works interfering in any way whatever with the interests of navigation at this particular point in the St. Lawrence River?

Mr. LEA. No; very much less so.

Mr. TAWNEY. The danger or hazard, if any, would be less than it is now?

Mr. LEA. Absolutely.

Mr. MAGRATH. You are speaking of the navigation of rapids now, I suppose?

Mr. TAWNEY. I am referring now to the navigation of the main channel of the St. Lawrence and to the navigation also through the canal that has been built.

Mr. LEA. It would be the simplest matter possible at this very moment or in the next six months for anybody besides ourselves concerned in the matter to establish gauges there in order to see whether we were disturbing the level of the water and making it different from present conditions.

Mr. TAWNEY. Do you or not know, Mr. Lea, that a board of control, such as is mentioned in the order of approval of the works of the Michigan Northern Power Co. and the Algoma Steel Corporation at the Long Sault has been appointed and that these works

have been under the direct control of this international board ever since their construction?

Mr. LEA. Well, I have understood so, yes.

Mr. TAWNEY. It is also a fact, as I am informed by a member of the board, that this far there has been no complaint on account of any injury or any defect whatever in the control and regulation of the levels of Lake Superior with respect to navigation.

Mr. VAN KENNEN. In addition to that, I want to say that not only do we concede that this commission has that power, but we welcome it.

Mr. TAWNEY. I wanted to know from Mr. Lea whether or not in his judgment as an engineer, such international control would prevent the possibility of any injury to navigation interests in the north channel of the St. Lawrence River at this particular point, assuming, of course, that the board of control would have complete and ample authority to regulate the discharge of water from time to time as the necessities of navigation might require.

Mr. LEA. It would be infinitely easier to detect any interference.

Mr. MIGNAULT. I would call your attention, Mr. Tawney, to the fact that there is no provision here for letting the water go by the dam otherwise than through the power wheels; whereas, I understand in the cases of the Michigan Northern Power Co. and the Algoma Steel Corporation there are sluice gates established by which the control of the levels of Lake Superior is exercised. There is nothing similar here.

Mr. SPRATT. Could not this commission arrange for that if it thought best to do so?

Mr. MIGNAULT. I assume we could make a condition that you should establish sluice gates.

Mr. LEA. With the present size of the wheels and the space required for them, we could easily have at least 300 feet to discharge the natural flow of the Little River without any obstruction except piers between the gates, which would be the full depth of the river itself.

Mr. MIGNAULT. It is hardly likely, I think, that navigation interests would complain of the high stages of the water. It was different on Lake Superior where high stages of water might be very detrimental.

Mr. LEA. It would not hurt navigation at all, but we thought of that and provided for it.

Mr. KING. I would like to say at this stage that the Dominion Marine Association has no fixed prejudice against improvements on the St. Lawrence River, and if works are going to be proposed that will not interfere with navigation, we must depart from the general principle about the piecemeal development. We must submerge our objections to some extent, and I was going to ask Mr. Lea to elaborate to some extent for the commission the various conditions which they are willing to incorporate in any possible order of approval, conditions that would be protection not only after the establishment of the works, but during the process of erection, so that at any stage navigation might not be prejudiced in any way. I do not say that I welcome an order of approval with these conditions, but I think now is the time to get from Mr. Lea what he will do.

Mr. LEA. You can impose any reasonable conditions you please, so far as I know.

Mr. VAN KENNEN. I think you might go further and say that in following the precedent already established by this commission there is no doubt but what a board might be established with respect to the detail of the work.

Mr. TAWNEY. If you will pardon me for suggesting it, in the Algoma Steel Corporation case and the Michigan Northern Power Co. case, which are the two power companies at the Long Sault on either side of the boundary, the engineers of the two Governments and the engineer representatives of the applicants themselves formulated, first, a series of conditions under which the works were to be operated above the power plants and also the controlling works, with a view of protecting the interests of navigation. These conditions were submitted to the commission for consideration in connection with its final order of approval and most of the conditions, with some modifications, were incorporated in the order of approval as conditions precedent to the right of the companies to go ahead with their work. These conditions were worked out by the engineers of the two Governments and the engineer representatives of the applicants themselves. Unless Mr. Lea wants to take the conditions of those two cases, I doubt whether it is possible for any engineer at this time to outline very definitely just what conditions are necessary. He might give us in a general way what his views are in respect to the matter.

Mr. VAN KENNEN. So far as we are concerned, we are ready and willing to submit to any reasonable regulation that will give us what we think we are entitled to and make this a commercially feasible proposition.

Mr. TAWNEY. What objection would there be, either on the part of the commission or on the part of the applicant, to the applicant formulating the conditions under which the works when completed or during construction and after completion, should be operated under an international board of control such as we have provided for in similar orders in many other cases?

Mr. VAN KENNEN. So far as the applicant is concerned I have no objection at all.

Mr. TAWNEY. I mentioned that because the engineers would be more likely to determine what was necessary in order to protect the rights of navigation than any one else.

Mr. VAN KENNEN. If there is any engineering objection I would like to be enlightened on it, but so far as the applicant is concerned, I am certainly willing to do it, if we can agree; I do not know whether we can or not.

Mr. KING. There are innumerable objections from our point of view. You are barring the passage of the river.

Mr. TAWNEY. I understood Mr. Van Kennen said they had nothing to offer and I understood you to say you had no evidence to offer.

Mr. KING. May I be allowed the opportunity to set myself right? I am a little afraid that by my remarks I may have appeared to have been willing to waive our objections at this stage. I meant entirely the contrary, sir. I thought that while Mr. Lea was testifying was the proper time to get from him a statement as to the conditions he was willing to have incorporated.

Mr. TAWNEY. I have no objection to his doing it if he wants to. It is entirely satisfactory to me.

Mr. POWELL. Have you any further questions to ask Mr. Lea, Mr. King?

Mr. KING. No; I think he has cleared up our misunderstanding, and I think we are both satisfied with what it was yesterday.

Mr. MIGNAULT. That is all your evidence, Mr. Van Kennen, is it?

Mr. VAN KENNEN. Yes.

Mr. MIGNAULT. Mr. McLean, have you any questions?

Mr. MCLEAN. Yes; I think possibly I have. Mr. Lea, would you be good enough to describe briefly but technically exactly your process of computation by which you arrived at the determination of what you call the natural flow in the Little River?

Mr. LEA. The elements required in the computation of the natural flow of the Little River, or any other river, were supplied me partially by Mr. Tucker and partially by my own judgment. The elements are the cross sections, what we call the hydraulic radius, the quantity of water we are dealing with in each case, what is called Kutter's coefficient, which is a coefficient indicating the roughness or smoothness, and the character of the bottom of the river. The three first mentioned were given to me by Mr. Tucker. The choice of the determination of the proper Kutter's coefficient I made myself, and the formula that I used in determining the slopes and the height and so forth, was what is called Chezy's formula, which is technical and is understood by engineers.

Mr. POWELL. That is almost word for word the same testimony you gave yesterday.

Mr. LEA. It is, yes, sir.

Mr. MIGNAULT. But it was not with regard to the Little River.

Mr. POWELL. Yes, it was. It is almost word for word the same order and sequence of sentences that Mr. Lea gave yesterday.

Mr. LEA. I used the Chezy formula with the coefficient derived from this coefficient of Kutter's, which I used my own judgment in choosing, based upon my knowledge of the river channel.

Mr. POWELL. What was the value of N that you used?

Mr. LEA. From .025 to .023. I said that also yesterday. I also used at the outlet sections, down at the lower end, the ordinary physical equation of V^2 equals $2GH$, which is technical and known to engineers. I believe I used them correctly so far as my arithmetic is concerned. I do not believe there are any errors of that kind. That is how I obtained my results. I do not see what more I can do in the way of explanation.

Mr. MCLEAN. You used the equation V^2 equaled $2GH$?

Mr. LEA. Yes.

Mr. MCLEAN. What coefficient did you use there?

Mr. LEA. I used no coefficient whatever for the reason that I used the results of experiments which I was able to make on the Severn River with flows up to four thousand and five thousand second feet. but under conditions in which I was able to measure accurately the actual water flowing and the slopes with conditions so unusual that I know no other way they could have been obtained.

Mr. MCLEAN. The data that you used and your computations are still in your possession, are they?

Mr. LEA. Well, I think some of them must be. Probably I made these over half a dozen times. Some of them were sent to Mr. Tucker and some of them are among my own files somewhere, but with this explanation they can be repeated by anybody.

Mr. MCLEAN. You would be willing to cooperate with our engineers in allowing them to examine such of those records as you have?

Mr. LEA. Yes; I will do that. If I can find a complete copy of the computations I shall be very glad indeed to give them to your engineers.

Mr. MCLEAN. Mr. Lea, I still seem not to have obtained some of the information required, and that is the particular coefficient as applied to that fraction V^2 equals $2GH$.

Mr. LEA. I used no coefficient at all.

Mr. MAGRATH. Mr. Lea, do you swear that the granting of this application will in no way interfere with the obtaining of the maximum efficency for water power in the St. Lawrence River; that this link would fit in with any development that will enable there being obtained the maximum efficiency from those rapids?

Mr. LEA. On the whole river?

Mr. MAGRATH. Yes.

Mr. LEA. Yes. I swear that so far as our information goes, and we have more information than anybody else, and we are making a study of that very question and have two or three parties of engineers there now, that that is my absolute opinion.

Mr. VAN KENNEN. You state that it will not have a detrimental effect?

Mr. LEA. No; it will incorporate itself naturally in the most efficient development of the river at that point.

Mr. MIGNAULT. But it would stand in the way of a development such as you have described of the whole river at the foot of the Ogden Island?

Mr. LEA. It would not stand in the way of any efficient development, Mr. Mignault, at that point.

Mr. MIGNAULT. That is of the whole river?

Mr. LEA. Of the whole river. In fact, we expect, if the whole river is developed in a short time, that it will be a part of it, and we can not see how it can be anything else.

Mr. POWELL. That is working in with a part of a general scheme?

Mr. LEA. Yes, sir; if the river is developed as efficiently as possible.

Mr. VAN KENNEN. I have no other witnesses.

Mr. MIGNAULT. You reserve the right to put in the profiles I asked you for?

Mr. VAN KENNEN. Yes.

Mr. LEA. There is another point that Mr. Tucker suggests to me. Some questions were asked by Mr. King yesterday if while what I have said might be true at the critical stage the increase in velocity would be greater in higher stages of the river, and I said yes, that was true, but if the navigation people really are willing and think that we are not improving the river there, we could stop the height of the dam at the point where the critical velocity occurs and put a concrete top on it, letting the rest of it overflow between the foot of Ogden Island and the mainland.

Mr. TAWNEY. In other words, you would put a spillway in that dam?

Mr. LEA. It would be all spillway.

Mr. KING. I understand you require the effect of the embankment in order to make good in the Rapide Plat.

Mr. LEA. Up to that point only.

Mr. KING. Beyond that you could relieve the conditions?

Mr. LEA. We would not injure navigation, at any rate.

Mr. KING. No, but you leave us still under this impression by your evidence, that the current would at least be increased by half.

Mr. LEA. Yes; something like that.

Mr. MIGNAULT. That closes your case, Mr. Van Kennen, does it?

Mr. VAN KENNEN. Yes, sir.

Mr. MAGRATH. Mr. Keefer, is it agreeable to you that Mr. King should now have some of his witnesses testify?

Mr. KEEFER. Certainly; we are in Ottawa all the time.

EVIDENCE FOR DOMINION MARINE ASSOCIATION.

GEORGE BATTEN, master mariner, sworn.

Mr. KING. You are a master mariner?

Mr. BATTEN. Yes, sir.

Mr. KING. With a certificate of what character?

Mr. BATTEN. A passenger certificate.

Mr. KING. You are a Kingston man?

Mr. BATTEN. Yes.

Mr. KING. On what waters have you your certificates?

Mr. BATTEN. Inland waters.

Mr. KING. Which covers the St. Lawrence River.

Mr. BATTEN. Yes, from Duluth down.

Mr. KING. How long have you held that?

Mr. BATTEN. Since they first came out in 1884.

Mr. KING. At present you are engaged by what company?

Mr. BATTEN. The Canada Steamship Lines.

Mr. KING. On what boats?

Mr. BATTEN. I was last season on the *Rapids King* from Prescott to Montreal.

Mr. KING. Tell the commission where these boats run.

Mr. BATTEN. From Kingston to Montreal.

Mr. KING. Connecting at Prescott with what other boats of the same company?

Mr. BATTEN. With the boats from Kingston to Toronto; it is through passenger business.

Mr. KING. Tell us what the through route is from Toronto to Montreal, and the hours of leaving and arriving.

Mr. BATTEN. They leave Toronto at 3 o'clock, arrive at Prescott 9.45 next morning, and we leave at 10.

Mr. KING. You are waiting for them at Prescott.

Mr. BATTEN. We make close connection there.

Mr. KING. And leaving at 10 o'clock you make Montreal when?

Mr. BATTEN. Six-thirty.

Mr. KING. Do you run the Lachine Rapids?

Mr. BATTEN. Yes.

Mr. KING. Do you always run the Lachine Rapids?

Mr. BATTEN. Unless there is a fog or delay or something of that kind. We have no time to spare, we have to get to Montreal before dark on account of the shallows below the bridge.

Mr. KING. You can not run the Lachine Rapids in the dark and so occasions arise when you land your passengers at Lachine.

Mr. BATTEN. Yes, or take them down the canal, but that seldom occurs. The schedule is so arranged that the bound-down boats, the *Kingston* or *Toronto*, must leave Kingston as early as half-past 5 in the morning.

Mr. KING. In order that the Lachine Rapids can be navigated before dark?

Mr. BATTEN. Yes, and to connect with the Quebec boat.

Mr. KING. The whole system is linked up together.

Mr. BATTEN. Yes, we connect with the Quebec boat and the Quebec boat connects with the Saguenay boat next morning at Quebec.

Mr. KING. What is the size of these boats?

Mr. BATTEN. The *Kingston* is about 290 feet long, and the *Toronto* is 280 feet; the *Rapids King* is 242 feet, the *Rapids Prince* 207 feet, and the *Rapids Queen* is not quite 200 feet.

Mr. KING. What is the draft of the rapids boats?

Mr. BATTEN. About 7 feet; it may vary a couple of inches on a passenger boat on account of the people walking backward and forward.

Mr. KING. I suppose they are light-draft boats designed for the rapids.

Mr. BATTEN. Yes.

Mr. KING. But capable of holding the full complement of passengers from Kingston or Toronto.

Mr. BATTEN. Yes; they are day boats.

Mr. KING. On the upbound trip, when do you leave Montreal?

Mr. BATTEN. One o'clock p. m.

Mr. KING. Is there any reason for selecting that hour; where does that put you at dark?

Mr. BATTEN. Coteau Landing.

Mr. KING. Do you go up Lake St. Francis?

Mr. BATTEN. Yes, and the Cornwall Canal.

Mr. KING. Where do you stop overnight?

Mr. BATTEN. We do not stop; we generally get to the Cornwall Canal at half-past 2 or 3 o'clock in the morning and go up the river. We run the rapids up.

Mr. KING. And you reach the Morrisburg Canal about when?

Mr. BATTEN. About two hours from Dickinson's Landing.

Mr. KING. About what hour?

Mr. BATTEN. Between half-past 4 and 5 o'clock.

Mr. KING. Your practice is to go up outside.

Mr. BATTEN. Yes, all the time; I have not been in the canal for years. I never go there unless fogs catch us.

Mr. KING. Does it make much difference in your time going up the rapids and going through the canal?

Mr. BATTEN. Quite a difference.

Mr. KING. What is your purpose in going outside?

Mr. BATTEN. We make much better time.

Mr. KING. Would you make your connection with the *Kingston* or the *Toronto* if you were obliged to take the canal?

Mr. BATTEN. It would be pretty close work. If you were ahead of time and nothing in the canal ahead of you you might get through.

Mr. KING. But the continual practice for years is to take the channel of the river through Rapide Plat.

Mr. BATTEN. Yes.

Mr. KING. Tell us what course you take going past Canada Island upbound.

Mr. BATTEN. We come up under the island about two lengths of the boat; we hug up to the island as near as we possibly can; we get up the eddy and the slack water.

Mr. KING. Could you make your way up in the midstream current?

Mr. BATTEN. No; I do not think so.

Mr. KING. Could you make your way up midstream under present conditions?

Mr. BATTEN. I do not think so; not with the *Rapids Prince;* you might with the *Rapids King.*

Mr. KING. What is the difference in the speed of the two boats?

Mr. BATTEN. There is probably 3 miles an hour.

Mr. KING. What does the *Rapids Prince* make?

Mr. BATTEN. About 13 miles is the best she could do. The *King* is a good deal better, 15 or 15½ miles.

Mr. KING. And with the *Rapids Prince* you do not think you could get up under existing conditions?

Mr. BATTEN. Not so far as I know.

Mr. KING. You could not get up without making use of the slack water?

Mr. BATTEN. I think it is impossible to get up without that.

Mr. KING. You are following the slack water along the side of Canada Island; where do you run from there?

Mr. BATTEN. There is an eddy up there but we can not get into that eddy because we are a little too wide. She is a twin-screw, and if you are going to take the current or the eddy out it is likely to throw her bows out and her stern in. It did it once in the *Rapids Queen,* and I never tried it afterwards.

Mr. KING. Going out in the slack water alongside Canada Island, do you have to go out into the main stream?

Mr. BATTEN. I just keep what we call between the eddy and the current.

Mr. KING. Up to where?

Mr. BATTEN. About half way up the island.

Mr. KING. And from there what happens?

Mr. BATTEN. Then I cross over toward the Canada bank on the north shore. You see she goes through sideways practically, heading on the Canada bank, she drifts over sideways and takes the slack water. I do not call it an eddy. What we call an eddy runs up and the slack water runs from a 6-mile current into a 3-mile current.

Mr. KING. In your course from the slack water alongside Canada Island to slack water on the north shore, your boat is steering in what direction?

Mr. BATTEN. About west; she is crossing the current not directly across.

Mr. KING. But she makes a point on the north shore slightly west of where she left Canada Island.

Mr. BATTEN. Yes; probably two or three lengths of the boat with the *Prince*. There is a pretty stiff current out there. I might tell you that sometimes the boat will run off if you have to go out. We have steam-steering gear which handles pretty quickly on the *Prince*, especially. She might come up a little too quick with you—that is, you would head straight into the current instead of going across.

Mr. KING. What would happen then?

Mr. BATTEN. She would just about hold her own in the current.

Mr. KING. In the existing current?

Mr. BATTEN. That is all she could do.

Mr. POWELL. How many points do you pay off?

Mr. BATTEN. Probably two. It is pretty hard just to tell, but in the current you can not get a boat just exactly where you want her, that is, she is going sideways.

Mr. KING. You do not make the point toward which your boat is pointing.

Mr. BATTEN. Not at all, we go into the bay in the slack water.

Mr. KING. Although your boat is heading more or less upstream.

Mr. BATTEN. Yes.

Mr. KING. And on occasions, when your boat has, through quick action of the steering gear, headed directly into the current, you say she has stood still?

Mr. BATTEN. Just holding her own.

Mr. KING. If you add to that current north of Canada Island one-half its present velocity, could the *Prince* or the *King* get upstream?

Mr. BATTEN. I do not think so.

Mr. KING. Now, it is suggested by Mr. Lea, the engineer for the applicant company, that you should be able to get up past Canada Island, in spite of the increased current, because you now have to contend with a greater current in the Rapide Plat. What have you to say about that?

Mr. BATTEN. Well, if you increase the current much more at Canada Island, so far as the *Prince* is concerned, she could not do it. The *King* might go, but the *Prince* would not go.

Mr. KING. You could not get over into this slack water.

Mr. BATTEN. No; she never would get there; at least I don't think so.

Mr. KING. Is it fair to estimate a boat's capacity to get upstream north of Canada Island by her ability to get up the Rapide Plat?

Mr. BATTEN. The Rapide Plat is different entirely; you have the advantage up there of the eddies entirely.

Mr. KING. Then you don't run up the strong current of the Rapide Plat?

Mr. BATTEN. She could not go up the strong current.

Mr. KING. You do not go into the stream?

Mr. BATTEN. We go into the eddies. Of course, we have there what they call a second boilers, and there is quite a strong eddy in the second boiler.

Mr. KING. Indicate briefly to the commission just what you do to get up the Rapide Plat; you make your course first——

Mr. BATTEN. Where from?

Mr. KING. Going upstream and approaching the Hog's Back.

Mr. BATTEN. We go up alongside the wharf at Ogden's Island, referred to this morning as Crapser's Wharf, I think. We go up about the length of a boat opposite that in the eddy. After we get out probably two lengths of the boat—I do not know, as the current is so strong, but the water is shallow and the boat does not run in shallow water like she does in deep water. We edge out to the Boilers; that is, letting her drift out, as it were, and we get out in the Boilers, and when we get out at the second boiler we cross by the canal bank, for the purpose of getting across the strong current and for the purpose of getting slack water alongside the canal.

Mr. KING. Do you ever fail to get across?

Mr. BATTEN. Yes; we drop too low and have to come back. Not very often, but sometimes.

Mr. KING. How do you estimate your ability to make the shore?

Mr. BATTEN. There is a little bay below the point on the north shore and we go up in that bay. There is a little point below that. It is so small you would not notice it on the chart. If we get below that we can not get up. We drop back and try it over again. I have done that several times.

Mr. KING. With what boats?

Mr. BATTEN. The *Rapids Prince*. I have done it with the *Spartan* and the *Corsican*, which were side-wheel boats.

Mr. KING. You failed to make the crossing?

Mr. BATTEN. To get past this little point; that is what they call the sticking point.

Mr. KING. But you make no effort whatever to stem the current in the Rapide Plat?

Mr. BATTEN. No, sir; you could not do it, we could not go up.

Mr. TAWNEY. Where is this point located with reference to Canada Island?

Mr. BATTEN. It is a long way up above that.

Mr. TAWNEY. Above Canada Island?

Mr. BATTEN. Oh, yes; away up.

Mr. KING. You are talking now of the Rapide Plat?

Mr. BATTEN. Yes; above the Hog's Back.

Mr. KING. Having now described your method of navigation past Canada Island and up through the Rapide Plat, will you make what comment you wish on the statement that because you could now get up the Rapide Plat you would be able to get up past Canada Island, even if the current is increased by one-half its present amount.

Mr. BATTEN. Under present conditions we can get up with an effort, but if you increase the current I feel sure we could not get up past Canada Island. I have not heard whether you are going to increase the current alongside the canal bank up to Canada Island. I think the current has a tendency toward the canal bank.

Mr. LEA. We are going to make it go right straight through.

Mr. BATTEN. Will it interfere with the eddy along the canal bank?

Mr. LEA. I do not think it will and I do not think you know anything about it. We are going to have eddies in that section, after we increase the velocity, the same as we have them now.

Mr. KING. Will you tell me, captain, whether the strength of the current in the Rapide Plat is one that you contend against or that you endeavor to avoid?

Mr. BATTEN. We avoid the current entirely.

Mr. KING. Then, the measure of the strength of the current there is no measure of the capabilities of navigation.

Mr. BATTEN. No.

Mr. KING. And that current has sometimes prevented you from actually getting across into slack water.

Mr. BATTEN. I have never been on any boat yet that we could go up the current there between the Boilers and the Canada bank. There may be boats that can do that, but I never was on one.

Mr. KING. Under existing conditions you never have failed to get up the river.

Mr. BATTEN. Oh, no; not up there.

Mr. KING. Although you have made different attempts at it on some occasions. I suppose coming down a single boat is not much incommoded.

Mr. BATTEN. I do not think it would interfere with a single boat at all.

Mr. KING. Having the draft which the *Rapids Prince* has.

Mr. BATTEN. Not in the slightest.

Mr. KING. Even a freighter might not be inconvenienced provided the stage of the water is good.

Mr. BATTEN. I do not think so.

Mr. KING. Do you know anything about the towing question?

Mr. BATTEN. I have towed some barges. I took down two ships cut in two, which is a very ugly tow, and part of a raft, and barges.

Mr. KING. It has been suggested that vessel interests would be protected provided 14 feet navigation was given over the Hog's Back. Suppose you enjoyed 15-foot navigation and that were decreased to 14 feet 6 inches, are you still as well off as at 15 feet?

Mr. BATTEN. No.

Mr. KING. Why?

Mr. BATTEN. The more water the better; the boat steers better.

Mr. KING. Has it anything to do with the safety of the ships?

Mr. BATTEN. The more water you have under the boat the easier she steers.

Mr. KING. Have you any instances to name to the commission of a boat getting into trouble with considerable water underneath her?

Mr. BATTEN. No; I tell you I have seen boats strike, boats that would run out of deep water into the shallow water, and the shallow water would be a foot deeper than we draw.

Mr. KING. And still strike?

Mr. BATTEN. Yes.

Mr. KING. Why?

Mr. BATTEN. I think because of going out of the deep water into the shallow. That is the only reason I can give.

Mr. MAGRATH. How long does it take you to go up the Rapide Plat?

Mr. BATTEN. Forty-five minutes.

Mr. MAGRATH. How long does it take you to go up the canal?

Mr. BATTEN. If you have it clear, probably an hour and a half.

Mr. MAGRATH. How long does it take you to come down through the canal?

Mr. BATTEN. We don't come down the canal.

Mr. MAGRATH. But if you did use the canal down?

Mr. BATTEN. It would be about the same time as going up.

Mr. MAGRATH. How long would it take you to come down the rapids?

Mr. BATTEN. About 15 minutes; it is a pretty strong current.

Mr. KING. Have you anything to say about this dangerous side draft?

Mr. BATTEN. Really, I never heard of it until I came into this building. No doubt a side draft would be dangerous, but so far as a single boat is concerned, I never heard of it.

Mr. VAN KENNEN. The character of the side draft between Canada Island and Ogden Island would be a menace to a tow.

Mr. BATTEN. Yes; but I never heard of it.

Mr. VAN KENNEN. You have been navigating another kind of a vessel.

Mr. BATTEN. Of course we could swing her out there.

Mr. VAN KENNEN. You have not been navigating tugs with tows very much.

Mr. BATTEN. Not an awful lot.

Mr. VAN KENNEN. Not in that section.

Mr. BATTEN. I have taken all classes of boats there.

Mr. VAN KENNEN. But taking tows is not your usual work.

Mr. BATTEN. No.

Mr. VAN KENNEN. One question with reference to what the commissioner asked as to upbound boats in the canal—I suppose the passenger boats have the right of way?

Mr. BATTEN. Well, it just depends.

Mr. VAN KENNEN. If two boats are coming up at the same time, does not the passenger boat have the right of way?

Mr. BATTEN. If you are ready to go ahead, yes, but you do not always do that.

Mr. VAN KENNEN. Because the other boat is ahead of you?

Mr. BATTEN. No; even if you are together you don't always get the right of way.

Mr. VAN KENNEN. You are entitled to it, I suppose?

Mr. BATTEN. Yes, we are supposed to.

Mr. VAN KENNEN. If I understood you correctly you said that you never navigated a boat that you know of that could breast the current up at the Boilers.

Mr. BATTEN. Between the Boilers and the canal bank; no.

Mr. VAN KENNEN. You never tried?

Mr. BATTEN. Yes; we stopped there.

Mr. VAN KENNEN. I understand, but that is not the course of navigation.

Mr. BATTEN. We could not get up there, I am satisfied of that.

Mr. VAN KENNEN. At that point?

Mr. BATTEN. At that point.

Mr. VAN KENNEN. What is the speed of your boat, the *Rapids King?*

Mr. BATTEN. About 15 miles.

Mr. VAN KENNEN. At that point where you say that the *Rapids King* would not go up, it is because of the swiftness of the current at that point?

Mr. BATTEN. Certainly.

Mr. VAN KENNEN. And therefore the current must be so swift at that point at the Boilers that a boat with a speed of 15 miles an hour can not go up.

Mr. BATTEN. That is right.

Mr. VAN KENNEN. Do you agree with the statement that has been made that there are points in that north channel, namely, this one point that you are speaking of at the Boilers, that is where the velocity of the water is greater than at this point at Canada Island.

Mr. BATTEN. Yes.

Mr. VAN KENNEN. You agree with that?

Mr. BATTEN. Yes.

Mr. VAN KENNEN. And that from your own experience as a navigator?

Mr. BATTEN. Yes; that is, right in the channel.

Mr. VAN KENNEN. I am speaking about the channel, of course. Now, when you come up you stick under Canada Island?

Mr. BATTEN. As close as I can.

Mr. VAN KENNEN. That is to take advantage of the slack water.

Mr. BATTEN. Yes; we take advantage of it all the time.

Mr. VAN KENNEN. And then you bear across to the other side to take advantage of slacker water on the other side.

Mr. BATTEN. Yes, after we come around the island and go about half-way up.

Mr. VAN KENNEN. You spoke about the eddy on the other side; you did not exactly say what effect you thought this change might have, but you seemed to be somewhat in doubt in regard to that, as to the effect on that idea. Would you not think that the effect of it would be to lengthen the eddy on the Canada side?

Mr. BATTEN. I do not think so. The eddy to-day comes up to the head of Canada Island, just up to the point where the shoal is.

Mr. VAN KENNEN. Don't you think that might increase that eddy.

Mr. BATTEN. I doubt it very much.

Mr. VAN KENNEN. You have as much doubt about that as you have doubt of the effect it would have on the other side.

Mr. BATTEN. Yes, I do not know what the effect of it would be on the other side.

Mr. VAN KENNEN. You say you can not get into the eddy on the north side because of the construction of your boat.

Mr. BATTEN. Yes.

Mr. VAN KENNEN. And therefore you have to make up in your boat in what we claim is not an eddy but the current.

Mr. BATTEN. The slack water over on the other side.

Mr. KING. He distinguishes three things, the eddy, the slack water, and the current.

Mr. VAN KENNEN. I understand that; I have been through there many a time. What you mean is where you went up, there was current.

Mr. BATTEN. Where we were crossing.

Mr. VAN KENNEN. There is current near the Canada bank.

Mr. BATTEN. Yes, slack current.
Mr. VAN KENNEN. It is not as strong as it is in the center.
Mr. BATTEN. No, nothing like it.
Mr. VAN KENNEN. And that is the reason you call it slack.
Mr. BATTEN. Yes, I do not call it an eddy.
Mr. VAN KENNEN. The eddy to your mind is the water running upstream.
Mr. BATTEN. Yes.
Mr. VAN KENNEN. Now, when you are navigating downstream, the course is all the way down the river.
Mr. BATTEN. Yes.
Mr. VAN KENNEN. You don't go into the canal at all.
Mr. BATTEN. Not at all, unless something happens.
Mr. VAN KENNEN. There are many points where the water is much shallower than it would be in the north channel.
Mr. BATTEN. Going down?
Mr. VAN KENNEN. Yes. You strike many places along as you go down there, where the water is much shallower than it is in the north channel.
Mr. BATTEN. Certainly, we run the rapids.
Mr. VAN KENNEN. Could you give us an estimate of the lowest depth of water in your entire course down, I mean the shallow places?
Mr. BATTEN. We strike sometimes, that will give you an idea.
Mr. VAN KENNEN. Where is that?
Mr. BATTEN. Split Rock or the Lachine Rapids. There is a cellar in this place and sometimes if you get an east wind the water goes down.
Mr. VAN KENNEN. I am trying to show that there are other places on your downstream course where the water is much lower than it would be at the same stage of water in the Rapide Plat.
Mr. BATTEN. Yes.
Mr. VAN KENNEN. Are there any other places in the Rapide Plat where you have found the current or the velocity of the water stronger than you did at Canada Island, aside from that point?
Mr. BATTEN. At Millpitch that would be stronger. We go very slowly for two or three lengths of the boat when you cross into the bay.
Mr. VAN KENNEN. Millpitch is above the head of Canada Island?
Mr. BATTEN. Yes; above the head of the proposed dam.
Mr. VAN KENNEN. How far?
Mr. BATTEN. From the head of the dam it would be about half a mile, but I do not know exactly.
Mr. VAN KENNEN. I suppose there, as you say, you go very slow?
Mr. BATTEN. Yes.
Mr. VAN KENNEN. It is pretty hard to navigate?
Mr. BATTEN. It is.
Mr. VAN KENNEN. It would improve the navigation there if the water was made slacker?
Mr. BATTEN. Certainly.
Mr. VAN KENNEN. Is there any other point on your way up aside from the Millpitch Point?
Mr. BATTEN. No.

Mr. VAN KENNEN. These are the two places in the stretch of your upstream navigation where the current as it is to-day with normal conditions on the river, where the current is stronger than it is at Canada Island, where the velocity is greater, I mean.

Mr. BATTEN. I think the velocity in Rapide Plat is, but going up Canada Island we go pretty slow, too, and that is where we have to judge by the speed of the current, so we go very, very slow and we stop sometimes.

Mr. VAN KENNEN. Do you want that answer to be interpreted by me and by this commission as changing your testimony, that the velocity of the current at the Boiler is stronger than it is at Canada Island, according to your judgment as a navigator?

Mr. BATTEN. I think it is stronger at Rapide Plat; that is, between the Boilers and the canal.

Mr. VAN KENNEN. Under present conditions?

Mr. BATTEN. What I am talking about now is——

Mr. VAN KENNEN. And also at what you call Millpitch Point?

Mr. BATTEN. Millpitch Point is pretty strong; we do not go over a mile an hour.

Mr. VAN KENNEN. I think that is fair, captain.

Mr. BATTEN. Outside of Millpitch, if we get out in the current, we can not go up there. In Millpitch we take advantage of the eddies.

Mr. VAN KENNEN. You take advantage of the eddy every time you can?

Mr. BATTEN. Certainly.

Mr. KING. When you mentioned the current at the Boilers being stronger than at Canada Island, as it is to-day, you meant between the Boilers and the canal bank?

Mr. BATTEN. Yes.

Mr. KING. The current in the Boilers itself runs which way?

Mr. BATTEN. What we call the second Boiler, we run up there, it is quite slack for the length of the boat; there is an eddy there and that is why we get up there and try and get headway, of course.

Mr. King. Tell me if your boat can under present conditions get from the Boilers over to the canal bank in spite of the current which is stronger than that which exists to-day down at Canada Island, why you would not be able to do that down at Canada Island under the new conditions?

Mr. BATTEN. I do not know what you mean.

Mr. KING. You have suggested that while you could get across from the Boilers to the north shore in spite of a current stronger than there is at Canada Island, that you do not think you could do that under the new conditions down at Canada Island.

Mr. BATTEN. No; if they increase that current there I do not think so. Of course I do not know what effect it would have on the eddies along there.

Mr. KING. Suppose they do not increase that current any more than the velocity which now runs between the Boilers and the north shore. What do you think the result would be?

Mr. BATTEN. Of course if it does not interfere with the slack water alongside the canal bank so we can cross over and get into the slack water, we could get up.

Mr. KING. So long as they do not interfere with the slack water north of Canada Island?

Mr. BATTEN. Yes.

Mr. KING. What interference, if any, do you think there will be with that slack water after the embankment is put in?

Mr. VAN KENNEN. He has testified that he does not know.

Mr. KING. He has not.

Mr. BATTEN. My own opinion is that the embankment will run the water right across to the canal bank.

Mr. KING. And do away with the slack water alongside the canal bank?

Mr. BATTEN. That is my opinion, but of course I only give it as my opinion.

Mr. KING. At how many miles per hour do you now go in the *Rapids Prince* upbound north of Canada Island?

Mr. BATTEN. When we run alongside the eddy—we are practically outside the eddy—about 2 miles; we do not go very fast.

Mr. POWELL. You mean in the strongest current?

Mr. BATTEN. She would stop in the strongest current.

Mr. POWELL. Which boat?

Mr. BATTEN. The *Rapids Prince;* she is the slower of the two.

Mr. KING. You say you would probably go 2 miles an hour in slack water and you are stopped in the swift water.

Mr. BATTEN. Yes; when she would head up.

Mr. MIGNAULT. Is the slack water always in the same position?

Mr. BATTEN. Practically the same.

Mr. POWELL. That is due to the character of the bottom of the river?

Mr. BATTEN. I think so. There are some places in the river where the cellars fill and meet; sometimes the cellar is level and the next time there is a deep cellar. I think it is due to the bottom of the channel.

Mr. POWELL. I was thinking about the increase of current down there. The river is narrow there?

Mr. BATTEN. Yes.

Mr. POWELL. Considerably more so than above anywhere until you get to the head of the canal?

Mr. BATTEN. Yes.

Mr. POWELL. Is the channel pretty well from bank to bank?

Mr. BATTEN. Yes; do you mean at Canada Island?

Mr. POWELL. Between Canada Island and Canada.

Mr. BATTEN. Yes.

Mr. POWELL. The water there is pretty rapid at present?

Mr. BATTEN. Yes; there is a pretty strong current.

Mr. POWELL. How many knots' increase would it stand before you could stem it at all?

Mr. BATTEN. Of course if it did not interfere with the eddies, that is another thing. You could take advantage and seesaw across. But if they shut us out of the eddies you have no possible chance of getting up at all. There is slack water alongside the canal bank to get up now We take advantage of all the slack water.

Mr. POWELL. You are speaking about the possibility of the destruction of these eddies by the embankment and dam.

Mr. BATTEN. Yes.

Mr. POWELL. Would you consider that to be the result of having a direct straight run down there?

Mr. BATTEN. Yes; there is quite a bend from Canada Island around there.

Mr. POWELL. And the withdrawal or diversion of the water down through that channel would have the effect of turning the water against the canal bank as it is to-day?

Mr. BATTEN. Yes.

Mr. GARDNER. How do the high and low stages of the river affect the eddies now?

Mr. BATTEN. I do not think it affects the eddies much.

Mr. VAN KENNEN. You say you come over on the Canada side and take the slack water up; do you have the slack water up practically from Millpitch down?

Mr. BATTEN. We go up the canal bank. There is a barge sunk there now and we have to go outside.

Mr. VAN KENNEN. So you would stay on that side of the river?

Mr. BATTEN. Yes.

Mr. VAN KENNEN. And of course you get the slack water up through Millpitch?

Mr. BATTEN. You don't run very fast, but you get it slacker than you would in midstream.

Mr. VAN KENNEN. I think the evidence is that Millpitch Point is half a mile above Canada Island?

Mr. BATTEN. I think it is.

Mr. POWELL. Are there any reefs projecting from either side that would cause difficulties?

Mr. BATTEN. At the head of Canada Island there is a ledge runs out, but it is a part of the island; a point, practically.

Mr. POWELL. But down between Canada Island and the Canada shore?

Mr. BATTEN. The canal bank runs out and forms a little bay, and that is where the eddy is.

Mr. POWELL. How far does it project from the marginal line?

Mr. BATTEN. It continues straight along the canal bank; it is like a bay.

Mr. MCLEAN. Did you ever navigate a boat on the Little River?

Mr. BATTEN. No.

Mr. MCLEAN. Do you know of any navigation ever on the Little River?

Mr. BATTEN. No; I do not.

Mr. MCLEAN. The canal and lock that were there were before your time?

Mr. BATTEN. I do not know anything about that side at all.

Mr. MCLEAN. How long have you been on the St. Lawrence River?

Mr. BATTEN. About 45 years.

Mr. MCLEAN. Is it a clear or a turbid stream; I refer to the main river?

Mr. BATTEN. It is clear water.

Mr. MCLEAN. Do you upon occasions find it carrying a great deal of sediment, or is it usually clear?

Mr. BATTEN. No; it is clear.

Capt. JAMES MARTIN, a witness produced for and on behalf of the Dominion Marine Association, after being first duly sworn, was examined and testified as follows:

Mr. KING. Where do you reside, Capt. Martin?

Capt. MARTIN. At Kingston.

Mr. KING. Are you a master mariner?

Capt. MARTIN. Yes, sir.

Mr. KING. You have a certificate for what boats?

Capt. MARTIN. For any steamships on inland waters.

Mr. KING. Have you had any experience piloting passenger boats?

Capt. MARTIN. No.

Mr. KING. Your experience has been with freighters?

Capt. MARTIN. Yes.

Mr. KING. And tugs?

Capt. MARTIN. And tugs.

Mr. KING. How long with freighters?

Capt. MARTIN. About eight years now.

Mr. KING. How long with tugs?

Capt. MARTIN. Over 30 years.

Mr. KING. In what waters?

Capt. MARTIN. The St. Lawrence River; Canadian and American waters.

Mr. KING. Would your towing take you up through the Rapide Plat?

Capt. MARTIN. Yes, sir.

Mr. KING. With what kind of boats in tow?

Capt. MARTIN. Barges.

Mr. KING. How many have you taken down there in a tow at one time?

Capt. MARTIN. I have taken down from five to seven.

Mr. KING. What is an ordinary tow?

Capt. MARTIN. About two or three now.

Mr. KING. Are there any particular troubles going down with a tow, and if so, where do you experience them?

Capt. MARTIN. The only particular trouble that I ever found was going through the Hog's Back, as they call it.

Mr. KING. Is there any trouble down by Ogden Island?

Capt. MARTIN. No, sir; I never experienced any trouble there.

Mr. KING. What have you to say as to the suggestion that boats frequently get into trouble between Ogden Island and Canada Island by running on the bottom there?

Capt. MARTIN. If they get displaced or have engine troubles up above this place they would naturally go into that place.

Mr. KING. Do you know of any other occasion on which a boat has gone on there?

Capt. MARTIN. No, sir.

Mr. KING. Your tows do not go down the canal?

Capt. MARTIN. No.

Mr. KING. Why not?

Capt. MARTIN. Because it is quicker down through the rapids.

Mr. KING. Is there any difficulty in entering the head of the Morrisburg Canal?

Capt. MARTIN. There is difficulty, yes.

Mr. KING. Has that anything to do with the tows taking the river?
Capt. MARTIN. Yes.
Mr. KING. Did you ever take a tow into the head of the canal?
Capt. MARTIN. No; I never did. I never had occasion to.
Mr. KING. You have taken freighters in?
Capt. MARTIN. Yes.
Mr. KING. You have heard the evidence as to the way in which freighters are taken in?
Capt. MARTIN. Yes, sir.
Mr. KING. Is that correct?
Capt. MARTIN. It is practically correct.
Mr. KING. You have heard the evidence as to the reading of the gauge at Cardinal in order to ascertain whether you can get down the Rapide Plat?
Capt. MARTIN. Yes, sir.
Mr. KING. Do you agree with that?
Capt. MARTIN. Sixteen feet there gives you 14 feet in the rapids.
Mr. KING. If your barge is drawing 14 feet and the reading indicates 14 feet in the rapids, it is not very safe navigation, is it?
Capt. MARTIN. It is not very safe with a barge.
Mr. KING. Have you ever touched?
Capt. MARTIN. I have, yes. I do not know who did not with stage of water, 14 feet.
Mr. KING. And even with a higher stage of water than 14 feet?
Capt. MARTIN. No, not often. I never did.
Mr. KING. If they did it would be because they were not in the exact channel?
Capt. MARTIN. They were not in the exact place or not taking the pitch in the right way.
Mr. KING. But if the thing is not done just exactly right they may touch?
Capt. MARTIN. Yes.
Mr. KING. It is a difficult piece of navigation?
Capt. MARTIN. It is.
Mr. KING. With a freighter downbound what trouble do you have near Odgen Island?
Capt. MARTIN. No trouble at all.
Mr. KING. Have you ever gone up the river?
Capt. MARTIN. Yes, sir.
Mr. KING. With what boats?
Capt. MARTIN. With tugs.
Mr. KING. More than one?
Capt. MARTIN. I went up with two.
Mr. KING. But I mean on more than one occasion.
Capt. MARTIN. Yes; on more than one occasion.
Mr. KING. How often?
Capt. MARTIN. I suppose I must have gone up more than 10 times anyway.
Mr. KING. What is the purpose in going up outside?
Capt. MARTIN. The reason I went up there that time was because they were improving the Morrisburg Canal and there was not enough water for the tug to get through there and we sent our light barges up through the canal and we went up outside.

Mr. KING. You have heard the description of the upbound navigation. Do you agree with that or do you differ? That is, with the course taken.

Capt. MARTIN. Description by whom?

Mr. KING. A description by Capt. Batton. In what way would your navigation with the tug differ from that?

Capt. MARTIN. The same way.

Mr. KING. Do you keep the same distance from the shore of Canada Island?

Capt. MARTIN. Yes, sir; you would naturally work the same way to get up there as he does.

Mr. KING. Did you get into the slack water?

Capt. MARTIN. Yes.

Mr. KING. Are there any places where you get into the real eddy?

Capt. MARTIN. You could not get into a real eddy there at Canada Island. Of course, you would not be long in it.

Mr. KING. Have you any idea about what speed you make over the bottom upbound at Canada Island?

Capt. MARTIN. I have stopped there with my boat and would not make half a mile an hour at the point.

Mr. KING. What boat are you referring to when you say that?

Capt. MARTIN. I am referring to the tug *Jessie Hall*. She was between an 11 and 12 mile an hour boat.

Mr. KING. Employed by the Montreal Transportation Co.?

Capt. MARTIN. At that time; yes.

Mr. KING. In their river work of towing barges?

Capt. MARTIN. Yes, sir.

Mr. KING. Have you been on any more high-powered boats?

Capt. MARTIN. Not any higher than her.

Mr. KING. And she stopped?

Capt. MARTIN. Yes; she would stop at times and start again, but she managed to get up.

Mr. KING. With the current increased by half at that point could you get up?

Capt. MARTIN. No, sir; I do not think so.

Mr. VAN KENNEN. I think you said that you were master of the *Jessie Hall* which went upstream at that point?

Capt. MARTIN. Yes, sir.

Mr. VAN KENNEN. At from 11 to 12 miles an hour?

Capt. MARTIN. Yes.

Mr. VAN KENNEN. With a boat going at 11 to 12 miles an hour you got up all right?

Capt. MARTIN. Yes; I got up all right.

Mr. VAN KENNEN. You say on one occasion you stopped, but you got up?

Capt. MARTIN. Yes.

Mr. VAN KENNEN. I suppose that the stop might have been due to the fact that your fire got a little low or something of that kind, or your steam was not just right?

Capt. MARTIN. It could have been that. I attributed it to the current.

Mr. VAN KENNEN. Well, it might have been due to the causes I have stated?

Capt. MARTIN. Yes.

Mr. VAN KENNEN. That is frequent when you are striking some of those points as you are going along up. Are you familiar with Weavers Point below?

Capt. MARTIN. I am.

Mr. VAN KENNEN. How would it compare with that?

Capt. MARTIN. It is stronger than Weavers Point by a long ways.

Mr. VAN KENNEN. When you go up above what do you call the Hog's Back?

Capt. MARTIN. There where the swell is.

Mr. VAN KENNEN. And you agree that the velocity there is greater than it is down at Canada Island?

Capt. MARTIN. It would be in the channel.

Mr. VAN KENNEN. You have to put across?

Capt. MARTIN. You have to put across; yes.

Mr. VAN KENNEN. Down at Canada Island you strike slack water that runs up as far as Millpitch Point?

Capt. MARTIN. Yes.

Mr. VAN KENNEN. Would your tug get into what they call the eddy?

Capt. MARTIN. You could not get into that. You would get into the water running upstream.

Mr. VAN KENNEN. When you get up to Millpitch Point you strike another pretty strong current?

Capt. MARTIN. Yes.

Mr. VAN KENNEN. Then you drift across to Ogden Island?

Capt. MARTIN. Yes.

Mr. VAN KENNEN. Of course, you agree, too, that the current at Millpitch Point is stronger than it is down at Canada Island?

Capt. MARTIN. I do not think so.

Mr. VAN KENNEN. You think it might be?

Capt. MARTIN. I think it is weaker.

Mr. VAN KENNEN. Well, if it were weaker and any improvement in the course of navigation made it less strong, I suppose it would be an improvement to navigation, would it not?

Capt. MARTIN. I suppose it would.

Mr. VAN KENNEN. And the same would be true above at the point where it is stronger in there?

Capt. MARTIN. If it was an improvement.

Mr. VAN KENNEN. If it would slacken the water, it certainly would be an improvement to navigation in that respect?

Capt. MARTIN. It would.

Mr. VAN KENNEN. In going downstream, when you get down pretty nearly below the Hog's Back and before you get down to Millditch Point, what course do you lay? Do you lay a course straight down to Canada Island?

Capt. MARTIN. Not at all.

Mr. VAN KENNEN. Where do you go?

Capt. MARTIN. Up on the canal banks.

Mr. VAN KENNEN. Just as far as you can?

Capt. MARTIN. Well, not as far as you can. You can not do that.

Mr. VAN KENNEN. Why can you not go as far as you can?

Capt. MARTIN. As far as you can right up that bank?

Mr. VAN KENNEN. Yes.

Capt. MARTIN. Well, you can not do it. It would be impossible.
Mr. VAN KENNEN. Well, you go over that way?
Capt. MARTIN. We haul over that way.
Mr. VAN KENNEN. What for?
Capt. MARTIN. To hold up there a little.
Mr. VAN KENNEN. Why?
Capt. MARTIN. There is a little cross current there.
Mr. VAN KENNEN. Is that the reason you hold up?
Capt. MARTIN. You have to hold up there as well as at other places.
Mr. VAN KENNEN. Never mind about the other places. Do you hold up there so as to avoid that cross current?
Capt. MARTIN. We hold up there a little, yes.
Mr. VAN KENNEN. It is to avoid the cross current, is it not?
Capt. MARTIN. There is a kind of a cross current there.
Mr. VAN KENNEN. Well, where does that cross current run?
Capt. MARTIN. In between the two islands.
Mr. VAN KENNEN. That is between Ogden Island and Canada Island?
Capt. MARTIN. Yes.
Mr. VAN KENNEN. If they were eliminated you would not have to hold up there, would you?
Capt. MARTIN. I do not suppose we would.
Mr. VAN KENNEN. You would have a straight run, would you not?
Capt. MARTIN. I do not know that it would be a straight run.
Mr. VAN KENNEN. It would be straighter than it is now, would it not?
Capt. MARTIN. Well, I could not say that.
Mr. VAN KENNEN. What would be the reason for it?
Capt. MARTIN. You might have to hold up to the canal bank.
Mr. VAN KENNEN. Not because of that current if there were not any?
Capt. MARTIN. You might have to hold up there to keep off the canal bank.
Mr. VAN KENNEN. Do I understand you to say that if the current pitched toward the canal bank you would have to hold up to the canal bank to avoid going into it?
Capt. MARTIN. No; but it would pitch the current over to the canal bank and we may have to hold up to avoid that the other way.
Mr. VAN KENNEN. That would have a tendency to straighten your course, would it not?
Capt. MARTIN. It would straighten it a little there.
Mr. VAN KENNEN. That is all.
Mr. MCLEAN. Capt. Martin, do you know anything about boats on the Little River. Have you ever been on the Little River with boats?
Capt. MARTIN. No, sir; I never was up there.
Mr. MCLEAN. How long have you known the St. Lawrence River?
Capt. MARTIN. About 30 years.
Mr. MCLEAN. Is the water in the St. Lawrence River clear or turbid?
Capt. MARTIN. It is clear.
Mr. MCLEAN. Is that its general condition?

Capt. MARTIN. It is clear, yes.

Mr. VAN KENNEN. Captain, when they ask you about the navigation on the Little River, you mean to say that you yourself have never navigated that river?

Capt. MARTIN. No.

Mr. VAN KENNEN. But you know that it is navigable and is navigated?

Capt. MARTIN. I have heard of boats going up there as far as they can go.

Mr. VAN KENNEN. I mean from the Little River down to the dam.

Capt. MARTIN. That is above the dam?

Mr. VAN KENNEN. You know that has been navigable for 20 years so far as boats are concerned, do you not?

Capt. MARTIN. I know that.

Mr. VAN KENNEN. And those are the types of boats that drew 6 or 7 feet of water?

Capt. MARTIN. Yes.

Mr. VAN KENNEN. What was the name of the largest boat?

Capt. MARTIN. The *Crosco*, the *Mary* and the *Algona*.

Mr. VAN KENNEN. And for a great many years they navigated in there, did they not?

Capt. MARTIN. Yes; they did.

Mr. VAN KENNEN. And the *Algona* drew at least 7 feet of water, did she not?

Capt. MARTIN. I think she did.

(Thereupon, at 5 o'clock p. m., the commission adjourned until 10 o'clock a. m., Thursday, October 3, 1918.)

THURSDAY, OCTOBER 3, 1918.

Pursuant to the adjournment, the commission reconvened at 10 o'clock a. m.

Mr. VAN KENNEN. I want to recall the last witness, Capt. Martin, for just a few questions.

Capt. James Martin, a witness produced for and on behalf of the Dominion Marine Association, was thereupon recalled, and testified further as follows:

Mr. VAN KENNEN. Capt. Martin, I understood you to say during your examination yesterday that there was no navigation in the Little River.

Capt. MARTIN. Well, I misunderstood the question.

Mr. VAN KENNEN. Will you explain about the navigation in the river that you know of, and I am particularly referring to the upper reaches.

Capt. MARTIN. I went in there with a boat drawing 9 feet of water.

Mr. VAN KENNEN. Of course, you were the pilot?

Capt. MARTIN. Yes, sir.

Mr. VAN KENNEN. You mean the upper reaches of the Little River?

Capt. MARTIN. Yes; I went in there with the tug *Myer* and a barge loaded with coal.

Mr. VAN KENNEN. Where was the coal discharged?

Capt. MARTIN. I think it was down by the bridge.
Mr. VAN KENNEN. At the docks?
Capt. MARTIN. At the coal docks.
Mr. VAN KENNEN. Have you been down more than once?
Capt. MARTIN. I think it was only once.
Mr. VAN KENNEN. Of course, you know about the steamers plying down the Little River to Ogdensburg, the *Myer*, the *Mary*, the *Cresco*, and the *Algona?*
Capt. MARTIN. Yes, sir; I have seen them coming out of there.
Mr. VAN KENNEN. All of them drew approximately from 6 to 7 feet of water at least?
Capt. MARTIN. Yes, sir.
Mr. GARDNER. How long ago was that?
Capt. MARTIN. That was about 10 years ago that I was in there.
Mr. VAN KENNEN. But these boats have been running up until quite recently?
Capt. MARTIN. Yes, sir.
Mr. POWELL. What part of the river did you have in mind when you were giving your evidence yesterday?
Capt. MARTIN. Down below the dam.
Mr. VAN KENNEN. I might explain that just after you get down below the dam, say a few hundred feet, there is a drop of water there and that is the real harbor into Waddington and they come up into that harbor from below.
Mr. TAWNEY. They come in there from the main river?
Mr. VAN KENNEN. Yes.
Mr. MIGNAULT. How do boats from Ogdensburg go to Waddington?
Capt. MARTIN. They can go in the Little River, can they not?
Mr. MIGNAULT. Is it the usual course to go down the north channel and come in south of Canada Island?
Capt. MARTIN. Yes, sir; I think there is a channel over that way. I have seen them coming that way.
Mr. MIGNAULT. What would you consider the best course to get to Waddington from Ogdensburg?
Mr. VAN KENNEN. With a load of coal, say.
Capt. MARTIN. I suppose by the Little River. That is the way I went that time.
Mr. MIGNAULT. How could you enter the Little River by the upper entrance?
Capt. MARTIN. By the upper reach above Ogden Island.
Mr. VAN KENNEN. As a matter of fact, there has been navigation there for a great many years by boats drawing 9 feet of water.
Mr. KEEFER. Did you say, Capt. Martin, that your boat was drawing 9 feet?
Capt. MARTIN. Yes, sir.
Mr. KEEFER. And you went into the Little River at the head?
Capt. MARTIN. Yes, sir.
Mr. KEEFER. What was the stage of the river, high or low water?
Capt. MARTIN. I think it was in August. The water would be fairly high then.
Mr. KEEFER. Do you know what the sailing directions are for the mouth of that river?

Capt. MARTIN. No, sir; not there.

Mr. KEEFER. I am told that the sailing directions say it is only 6 or 7 feet.

Capt. MARTIN. I know this boat that I had drew 9 feet.

Mr. KEEFER. It must have been very high water.

Capt. MARTIN. Yes; it was probably high water.

Mr. VAN KENNEN. Mr. Chairman, I would like now to recall Mr. Connolly for a moment.

W. S. CONNOLLY, a witness previously produced for and on behalf of the applicant, was recalled and testified further, as follows:

Mr. VAN KENNEN. I want to ask one question, Mr. Connolly, as to the amount expended by the New York & Ontario Co. in the acquisition of the property and in the necessary engineering and mechanical work in order to ascertain the extent and rights of your company.

Mr. CONNOLLY. We have expended to date over $400,000, irrespective of accumulated interest on the investment.

Mr. TAWNEY. That expenditure extends over a period of how long?

Mr. CONNOLLY. About 10 years.

Mr. VAN KENNEN. Mr. Connolly, what do you say about your personal knowledge with regard to the navigation of the Little River by way of the upper entrance?

Mr. CONNOLLY. I took the tug *Mary*, drawing between 9 and 10 feet, down there myself, in and out.

Mr. VAN KENNEN. The tug *Mary*.

Mr. CONNOLLY. Yes, sir; and she is one of the large river tugs and I am not a navigator.

Mr. VAN KENNEN. What do you know about the fact of their having navigated that river regularly for a great many years?

Mr. CONNOLLY. Ever since my boyhood tugs have gone in and out there and have taken in and out barges. It has been used as much as the other part of the river. They had a line of three passenger boats running there continually.

Mr. VAN KENNEN. By what course?

Mr. CONNOLLY. Both courses.

Mr. VAN KENNEN. I am speaking about the entrance to the Little River. What boats do you know of in your experience that have been run in there?

Mr. CONNOLLY. Apart from the tugs and barges the passenger boats were the *Algona*, the *Island Dove*, the *Massena*, the *Cresco*, and the *Orizaba*. There have been others. I can recall those just now that were regularly run as passenger boats plying in and out there.

Mr. VAN KENNEN. Where were they plying between?

Mr. CONNOLLY. The river port towns; mainly Waddington and Ogdensburg. They had a daily line running up and down there.

Mr. MIGNAULT. How did they get to Waddington?

Mr. CONNOLLY. One or two started from the dock above the dam.

Mr. TAWNEY. The dock is above the dam and above the bridge?

Mr. CONNOLLY. Yes. They had a dock on each side of the Little River.

Mr. MIGNAULT. They ran there at all seasons?

Mr. CONNOLLY. Yes, sir.

Mr. MIGNAULT. As I understood from Mr. Tucker, the mouth of the Little River was so overgrown with weeds that it was difficult for a motor boat to get in.

Mr. CONNOLLY. These steamers go right through the weeds and tear them up with their wheels. The weeds do grow there 10 to 12 feet long. I know, because I have hunted ducks there.

Mr. MIGNAULT. So a motor boat would have more trouble getting in than a larger steamer?

Mr. CONNOLLY. Yes, sir.

Mr. POWELL. Are those boats side-wheelers?

Mr. CONNOLLY. No.

Mr. KEEFER. There has been no improvement to navigation on the river for a considerable time, has there? Do you know of any at the entrance to the river?

Mr. CONNOLLY. No.

Mr. KEEFER. There has been no improvement whatever made by the department of the Government?

Mr. CONNOLLY. None in my experience.

Mr. KEEFER. It has never been improved to your knowledge?

Mr. CONNOLLY. No. I think there was a little cleaning out of stones there about 40 or 50 years ago.

Mr. KEEFER. And so far as the river below the dam is concerned, where you come from the St. Lawrence up toward the dam, is there any navigation on the way up at all?

Mr. CONNOLLY. Oh, yes; it goes right up to the dock where we stopped the day the commissioners were there.

Mr. KEEFER. That is below the dam?

Mr. CONNOLLY. About 1,000 feet below the dam.

Mr. KEEFER. There has been no improvement in navigation down there?

Mr. CONNOLLY. No; but you can take a 20-foot boat up there.

Mr. TAWNEY. There is a pulp-wood plant of some kind on the lower side of the dam, is there not?

Mr. CONNOLLY. Yes, sir; there is very deep water there.

Mr. TAWNEY. I know there was a very large boat lying there unloaded when we were there during August.

Mr. CONNOLLY. Yes; there are over 40 feet of water there.

Mr. MIGNAULT. That was below the dam, was it not?

Mr. TAWNEY. Yes; that is what I said.

Mr. MIGNAULT. Mr. Connolly, there are a few questions I would like to put to you. It was stated by one of the witnesses for the applicant that if the dam were placed at the point A, on plate 1, there would be some lands flooded for which compensation would have to be arranged.

Mr. CONNOLLY. Yes, sir.

Mr. MIGNAULT. Could you tell me what are those lands, which I understand do not belong to the company, and which would be flooded if the dam were placed at the point A?

Mr. CONNOLLY. There are four or five vacant lots there. We have been in negotiation for them and have an understanding with the owners that they sell at a reasonable price.

Mr. MIGNAULT. What is the value of those lots?

Mr. CONNOLLY. I estimate that about $10,000 would cover the whole thing.

Mr. MIGNAULT. The point is a little confused in my mind, because an exhibit was introduced yesterday, being a plot of the township identifying the lots which were granted by the State of New York at the end of last century, and it was then said that the company owned all these lands comprising the whole water front. I presume from what you say that there are certain pieces of ground that do not yet belong to your company?

Mr. CONNOLLY. They are shown here on this map. For instance, there is one marked "Dickson." That is in the hands of an estate. There is a small creamery there.

Mr. MIGNAULT. Referring to Exhibit A–34, will you state what lands on the water front below the site of the present dam do not belong to your company?

Mr. CONNOLLY. The Dickson, the Crapser, the Rutherford, the Burdick, and the Forbes lots.

Mr. TAWNEY. What is the total frontage of those lots?

Mr. CONNOLLY. Less than 250 feet.

Mr. MIGNAULT. Is that vacant land?

Mr. CONNOLLY. It is vacant land.

Mr. POWELL. That is between the bridge and the dam?

Mr. CONNOLLY. No; it is lower than the dam.

Mr. VAN KENNEN. It is below sites A and B.

Mr. GARDNER. Is it on the mainland?

Mr. CONNOLLY. Yes, sir.

Mr. MIGNAULT. Between the site of the present dam and point A on plate 2, does your company own all the land on Ogden Island?

Mr. CONNOLLY. It does not. It owns the escarpment from the line of the Crapser and Porteous farms eastward about 1,000 feet, including the projecting side on this south shore of Ogden Island, all of which is shown on the map.

Mr. MIGNAULT. What is the average width of the stretch of land on the point?

Mr. CONNOLLY. It is about 80 feet.

Mr. MIGNAULT. If the dam were constructed at the point A, would any flowage extend beyond the stretch of land indicated on the plan?

Mr. CONNOLLY. Yes; it would be necessary for us to acquire the escarpment from the land between the Porcheous and Crapser properties, where our property ends immediately east of the existing dam, a distance of about 500 or 600 feet.

Mr. MIGNAULT. That is to say, you would have to acquire a stretch of land from the Crapser-Porteous line upstream about 500 feet?

Mr. CONNOLLY. Yes; to the existing dam.

Mr. MIGNAULT. Would the flowage extend beyond the stretch of land in front of the Porteous property?

Mr. CONNOLLY. No; that is high ground. We own all the land that would be affected.

Mr. MIGNAULT. Between the line of the Crapser-Porteous properties and the point which juts into the river, with the latter included, you own all land that would be affected by flowage?

Mr. CONNOLLY. Yes; Mr. Porchas sold us that for that purpose.

Mr. VAN KENNEN. I think the deed is in evidence. May I ask what is the character of the bank from the point of the Porteous-Crapser line westwardly to your property?

Mr. CONNOLLY. It is almost a perpendicular clay bank.

Mr. MIGNAULT. Just where would point A on plan A–34 be?

Mr. CONNOLLY. From approximately the foot of Oak Street straight across to Ogden Island.

Mr. VAN KENNEN. There is just one thing where I either misunderstood Commissioner Mignault or I have not gotten a clear understanding of the fact. The property which Mr. Cleveland testified was owned by this company is that property on the river between the south end of the dam and extending directly across to Ogden Island just below the dam.

Mr. CONNOLLY. We do not own any property west of the dam.

Mr. MIGNAULT. I did not understand that the original grants covered any water rights or any right to the bed of the river, not in terms.

Mr. VAN KENNEN. The original grant did not, but the State of New York in the act of 1826 granted to these people.

Mr. MIGNAULT. Outside of the act of 1826, you have no title from the State of New York to any of the bed of the river? That is, outside of the acts of 1808 and 1826, you have no title from the State of New York to any part of the bed of the Little River?

Mr. VAN KENNEN. We presume that our grants give us that right. We have not it in terms, if that would answer. It does not say the bottom of the river, but it does say that we go to the stream.

Mr. MIGNAULT. But you have neither as representing the original grantees nor by subsequent grants any title from the State of New York to the bed of the Little River, outside of what title may be contained in the acts of 1808 and 1826?

Mr. VAN KENNEN. And the original grants, whatever rights they may have given us.

Mr. MIGNAULT. But the original grants in terms did not give you any water rights?

Mr. VAN KENNEN. No. Of course, I will speak of that a little later. It is a matter of law.

Mr. MCLEAN. Mr. Connolly, I show you plate 1 and show you on that plate the proposed dam indicated by the letter A. I ask you if you are familiar with that location in the Little River.

Mr. CONNOLLY. I am.

Mr. MCLEAN. Can you tell us what the depth of water is at point A?

Mr. CONNOLLY. That depends upon the stage of the river, of course, but the elevation of the bottom is about 200 to 203 feet at mean tide at New York. That would give us usually about 12 or 13 feet of water there.

Mr. MCLEAN. Where do these steamers about which you have testified land? Do they land to the right of point A or to the left of point A? In other words, do they land on the downstream side of point A?

Mr. CONNOLLY. Yes.

Mr. MCLEAN. How far is the existing wharf indicated on plate 1, marked A?

Mr. CONNOLLY. About 100 feet.

Mr. MIGNAULT. The existing wharf is opposite the J. S. Rutherford property?

Mr. CONNOLLY. Yes; it belongs to Mr. Rutherford.

Mr. MCLEAN. Mr. Connolly, you spoke of some dredging operations in the Little River. Do you know when those operations were carried on?

Mr. CONNOLLY. No; they were a long time ago.

Mr. MCLEAN. About 1880?

Mr. CONNOLLY. I would say before that.

Mr. MCLEAN. By whom were they undertaken, if you know?

Mr. CONNOLLY. I do not know. I assume the National Government.

Mr. MCLEAN. Have you ever had any examination made to ascertain what those operations were?

Mr. CONNOLLY. No. In making cross sections of the river myself there I found the evidence of where the dredge had gone through and put a dump over at one side.

Mr. MCLEAN. You have made examinations of the bed of the river yourself, have you?

Mr. CONNOLLY. Yes; I have.

Mr. MCLEAN. I show you Exhibit A–31 and ask you if you can indicate on that exhibit where you made these examinations?

Mr. CONNOLLY. The whole length of the channel.

Mr. MCLEAN. That is from the point marked "1" downstream throughout the whole channel?

Mr. CONNOLLY. The whole length of the river; yes.

Mr. MCLEAN. You made an examination at the point marked "1," did you?

Mr. CONNOLLY. Yes.

Mr. MCLEAN. What examination did you make there?

Mr. CONNOLLY. By cross sections we first found 5,000 feet of area.

Mr. MCLEAN. Did you make any soundings?

Mr. CONNOLLY. Yes, sir.

Mr. MCLEAN. Any borings, or just soundings?

Mr. CONNOLLY. Just soundings.

Mr. MCLEAN. You said in your examination you had found indications of where this dredging had been carried on. Will you indicate on Exhibit A–31, by reference to the different lines across the Little River there shown, just where you found that indication, or as nearly as you can?

Mr. CONNOLLY. I would say it was 100 feet south of cross section No. 1 on this map.

Mr. MCLEAN. That is downstream?

Mr. CONNOLLY. Downstream, practically due south.

Mr. MCLEAN. For how great a distance downstream did those indications continue?

Mr. CONNOLLY. It was merely a clearing off of the corner of the shoal, a very short distance.

Mr. MCLEAN. Did you find that indication on each side of the channel or only on one side?

Mr. CONNOLLY. It is practically only on one side. It was more marked on one side.

Mr. MCLEAN. Was that clearly to be ascertained at point No. 1?

Mr. CONNOLLY. No; it is south of point 1.

Mr. McLEAN. Did you find those indications at any other portion of the channel?

Mr. CONNOLLY. No; that was the only place it could have ever been touched.

Mr. McLEAN. I understand you testified that you have expended some $400,000 in acquiring these various properties.

Mr. CONNOLLY. Yes, sir.

Mr. McLEAN. And may I ask you whether that expenditure was in cash or in securities of your company?

Mr. CONNOLLY. Cash.

Mr. McLEAN. Actual cash outlay?

Mr. CONNOLLY. Actual cash outlay outside of the accumulated interest on the money put out.

Mr. MAGRATH. That was for the franchise?

Mr. CONNOLLY. This company was incorporated not by myself but by other people, and under the authorization of the public service commission of New York they purchased this property by giving certain amounts in securities and cash. We purchased all their interest from them and paid them a certain amount in cash. Then we went on with the expenditures ourselves for the plans, etc.

Mr. MAGRATH. When you say "in securities," do you mean your own stock in your company?

Mr. CONNOLLY. Yes; under the order of the Public Service Commission of the State of New York the stock in our company can only be sold for cash, $100 a share, and the bonds at 81 per cent of the par value. The commission in this case did set the amount of securities which could be issued, the price at which they should be sold, and the amount of money which should be expended in each part of the work. They put their engineer on it and considered the whole case.

Mr. MAGRATH. What proportion of that $400,000 is represented in property?

Mr. CONNOLLY. Approximately one-half, I would think.

Mr. McLEAN. May I ask just one more question, Mr. Connolly, about the water? You are familiar with the waterways indicated between points A and B, are you not?

Mr. CONNOLLY. Yes.

Mr. McLEAN. There is a channel, at least for small boats, at the present time from the point A up along Ogden Island to the dam?

Mr. CONNOLLY. Yes.

Mr. McLEAN. What depth of water does that channel carry?

Mr. CONNOLLY. From 6 to 15 feet.

Mr. McLEAN. And that runs right up to the back side of the existing dam, does it not?

Mr. CONNOLLY. Yes; that channel did not exist, though, prior to the year 1854. The old lock was washed out and 3 acres of the island were carried out there.

Mr. McLEAN. That is, the break in the dam was on the Ogden Island end of it?

Mr. CONNOLLY. Yes; and the gravel that was in the soil was deposited and formed that existing gravel bed there. The earth that was in it was carried on down and has become a shoal.

Mr. McLEAN. I show you New York Exhibit 1 and call your attention to the Ogden Island end of the dam, which I will mark with the letter K. I ask you if that is not a fill that was put in to close up the break that occurred which you have just testified to?

Mr. CONNOLLY. Yes; although this plan here does not show it correctly.

Mr. McLEAN. In what respect is it incorrect?

Mr. CONNOLLY. This shows a wide fill here [indicating]. As a matter of fact, that is a crib dam instead of a fill. It runs from 24 to 40 feet wide on the bottom. It is a gravity crib dam.

Mr. McLEAN. Filled with rocks?

Mr. CONNOLLY. Filled with rocks; yes.

WILLIAM J. STEWART, Dominion hydrographer, sworn.

Mr. KEEFER. You are Dominion hydrographer, and you have been examined before this commission many times?

Mr. STEWART. Yes.

Mr. KEEFER. Regarding this problem, taking up, first of all, the question of the compensating works and dealing first with the proposed dam between Canada Island and Ogden Island, you have heard the testimony offered on behalf of the applicants as regards the effect of the backwater; are you able to agree with that data as regards the length upstream the backwater will go?

Mr. STEWART. Pretty nearly.

Mr. KEEFER. Would you give us your version of the effect of the backwater, because that is one of the most important problems?

Mr. STEWART. In this matter, shortly after the application came in, Mr. Connolly was good enough to send Mr. Lea and Mr. Tucker to my office, and they supplied me with almost all the information they had in connection with their surveys and investigations along the river. Of course, I had all the data from the observations and stream measurements that have been taken by the United States Lakes Survey, and I had in my office all the records from the canal gauges taken by the railways and canals department of the Dominion since 1860. These records extending over such a period are extremely valuable. I hardly think that the engineers who started them really knew what a valuable work they were initiating. Mr. Tucker supplied me with the readings of the various gauges he had located in the Rapide Plat and these give us some idea of the slope between the various points in that stretch of the river. With this information I started a computation for the effect, first of all, of the diversion through the Little River; that is, the new diversion in addition, up to the 30,000 c. f. s., and then the effect of the backwater that would be created by the construction of the embankment between Canada Island and Ogden Island. First of all, when the matter came up, the computations entailed the effect of the diversion, which is twofold: it lowers the water on the gauge at Lock 24, or the head of the Morrisburg Canal, but it does not have any effect on the level of the water below Canada Island, because it is returned in the same quantity, and the same quantity is passing down the same cross section.

But inasmuch as it has affected the regimen of the Rapide Plat, backwater is created and extends up so as to restore to a limited ex-

tent some of the water lost at Lock 24 by the diversion through the Little River. This restoration, I figure, at low water, to amount to about 0.2 foot, the low-water discharge being about 194,000 c. f. s. in the river.

Mr. MIGNAULT. When you say "this restoration" you mean the restoration caused by what?

Mr. STEWART. Caused by the diversion coming down through the Little River and backing the water up in the Rapide Plat. That is 0.2 foot at Lock 24. That is to say, by the diversion of 30,000 c. f. s. if the 30,000 c. f. s. be taken out of the river altogether, if we could divert it and send it off down through the State of New York some place and not bring it back to the river, the gauge at Lock 24 would be reduced by 2 feet and it would reduce the level of the water at Lock 23 by about the same amount.

Mr. VAN KENNEN. You said about 2 feet.

Mr. STEWART. About 2 feet. When the 30,000 c. f. s. comes back to the river it restores the level at Lock 23, and that increase in level there means a backwater of about two-tenths of a foot at Lock 24. The other effect will be that due to the construction of the embankment between Canada Island and Ogden Island. This will raise the water all the way from Canada Island to Iroquois and probably beyond.

Mr. MIGNAULT. What distance?

Mr. STEWART. About 7 or 8 miles anyway. I find that the water would be raised over and above what it would be when the diversion of 30,000 c. f. s. is restored to the river by about 3 inches at Lock 24. or would make a loss from the present condition of the river of 1.53 feet.

Mr. MIGNAULT. I thought it was a gain rather than a loss, from what you said; would the level be higher at Lock 24 by reason of the construction of the embankment?

Mr. STEWART. No. The explanation of that is rather complicated, but it is roughly in this way. A diversion of 30,000 c. f. s. through the Little River lowers the water at Lock 24 by about 2 feet. When the embankment is put in it raises the water at Lock 24 by about 3 inches, so that it leaves a net loss of 1.53 feet.

Mr. MIGNAULT. You are speaking of the net loss; that is to say, the loss caused by the diversion of the 30,000 c. f. s. is not entirely made up by the embankment. There is a net loss of 3 inches at Lock 24.

Mr. KEEFER. Mr. Lea was also figuring on the submerged weir to help out the situation.

Mr. LEA. The question is a question of fact as to which we do not agree.

Mr. KING. The net loss is not 3 inches.

Mr. STEWART. No; it is 1.53 feet.

Mr. KEEFER. The effect of your testimony would be that by virtue of taking away through the Little River 30,000 c. f. s and building a dam from Ogden Island to Canada Island, after all that is done, you have a lowering of the level on the lock sill of Lock 24 of 1.53 feet?

Mr. STEWART. Yes.

Mr. KEEFER. You would decrease the navigation facilities that much?

Mr. STEWART. Yes.

Mr. KEEFER. Go on, Mr. Stewart.

Mr. STEWART. Now, the construction of the embankment between Canada Island and Ogden Island will raise the water at the foot of Ogden Island by 1 foot over the present conditions, and at Hogs Back, that we heard so much about yesterday, there will be a loss of about an inch.

Mr. MIGNAULT. A net loss?

Mr. STEWART. A net loss; yes.

Mr. MIGNAULT. It would be lower by 1 inch than it is at present?

Mr. STEWART. That is what it would be under present conditions, with a flow of 194,000 c. f. s.

Mr. KEEFER. Have you made it perfectly clear as to what stage of the river level your figures would relate?

Mr. STEWART. Using the low-water stage with a passage of 194,000 c. f. s.

Mr. LEA. Does that mean that Mr. Stewart agrees with what I said yesterday, that there would be an inch loss at 194,000 c. f. s.?

Mr. STEWART. That is what I understood you to say yesterday, but that is not what I understood you to say the day before.

Mr. LEA. I did not refer to that the day before at all.

Mr. KING. Yes; I asked you the question.

Mr. LEA. 195,000 c. f. s.

Mr. KING. 190,000 c. f. s. I asked.

Mr. LEA. You did not ask about 195,000 c. f. s. I said that there would be a loss of an inch. There is an agreement with me there, and I wanted to be sure of that, because there is this disagreement as to other points.

Mr. KEEFER. Now, reason out your problem, Mr. Stewart.

Mr. STEWART. If I take a discharge of 220,800 c. f. s., which corresponds to the level of 224 at the sill of Lock 24 and 212 at the sill of Lock 23, I find that the water is raised 1.3 feet at the foot of Ogden Island and 0.33 foot at the Hogs Back. That stage of the river is practically what Mr. Lea is talking about as the critical stage, and a net loss of 1 foot at Lock 24. I do not know whether it is necessary to take in any of the higher stages of the river.

Mr. KEEFER. Unless they wish to cross-examine you, you need not go into that, because what we are concerned about is the lower stages of the river for navigation purposes. The higher water will take care of itself. I would like to ask you some questions for Mr. Magrath's information. He asked some questions yesterday; he was not very clear about the effect of changes of discharge. I might say that the records show that a change of 1 foot at one gauge means practically the same change at the foot of the canal.

Mr. STEWART. For instance, at a very low stage of the river the water at Lock 23 is 210, the water at Lock 24 is 222.04. A water stage of 212 at Lock 23 means 224 at Lock 24. At a stage of 216 at Lock 23 means 227.95 at Lock 24.

Mr. MAGRATH. The point I was concerned about yesterday when Mr. Lea was on the stand was as to the swells and the dips at various elevations.

Mr. STEWART. You can not tell that very well except that the applicants had a number of gauges in the rapids at various stages of the river, and I think they are all plotted here.

Mr. MAGRATH. Mr. Lea, as a matter of fact, answered that yesterday.

Mr. STEWART. I think that is all I have to say with regard to the backwater.

Mr. KEEFER. Let us get this summarized, so that we ordinary lawyers can understand it. In the first place a diversion of 30,000 c. f. s. through this Little River, without any compensating works, would result in a reduction of 2 feet of loss of water on the sill of Lock 24.

Mr. STEWART. That is what I make it.

Mr. POWELL. Provided the water was entirely abstracted?

Mr. STEWART. Yes; I took that from the canal records.

Mr. KEEFER. Then if put back into the river without compensating works, by virtue of the backwater, you would restore that level nearly two-tenths of a foot.

Mr. STEWART. Yes.

Mr. KEEFER. Leaving a net loss of 1.8 feet.

Mr. STEWART. Yes.

Mr. KEEFER. By putting in, however, the compensating works between Canada Island and Ogden Island you could restore that total loss by virtue of the diversion and putting the water back into the river, so that your net loss is only 1.53 feet.

Mr. STEWART. Yes.

Mr. KEEFER. Therefore, from a navigating point of view, you would lose that much facility for navigation?

Mr. STEWART. Yes.

Mr. MIGNAULT. That is a little more than 6 inches.

Mr. STEWART. About 18 inches; the net effect is 1.53 feet of a loss.

Mr. KEEFER. Is there anything further you wish to state to the commission as regards that first branch of the compensating works and the effect thereof on the levels—if not, pass on to the next point, namely, the proposed submerged weir.

Mr. TAWNEY. Before you do that, I would like to ask to what extent are your conclusions different from those of Mr. Lea with respect to the effect of this construction between Canada Island and Ogden Island?

Mr. STEWART. I am not sure that I know what Mr. Lea gives as the net loss; I am not clear on that.

Mr. TAWNEY. As to the effect on the Hogs Back and the sill of Lock 24.

Mr. STEWART. I do not know what Mr. Lea's effect at Lock 24 is. Mr. Lea seems to disagree with my statement.

Mr. LEA. We agree as to the Hogs Back.

Mr. TAWNEY. You are agreed as to the effect at Hogs Back?

Mr. STEWART. At low water; yes.

Mr. MIGNAULT. It is very important that this agreement should be confirmed by Mr. Lea.

Mr. KEEFER. Do you, Mr. Lea, concur with what Mr. Stewart says now with regard to the Hogs Back at low water?

Mr. STEWART. There is a loss of one-tenth.

Mr. LEA. There is a loss of one-tenth at 195,000 c. f. s. and at 220,000 c. f. s. there is a gain of 4 inches. I said, if you remember, that the gain would be from 4 to 6 inches at the Hog's Back, and Mr. Stewart says 4 inches, and I said that at the lower point there

would be a loss of an inch, and Mr. Stewart says an inch. We agree very nearly in toto. He takes my minimum and I give a maximum and a minimum.

Mr. KEEFER. Now, we will take up the next phase of the compensating works, namely, the proposed submerged weir. Mr. Lea's testimony was to the effect that by filling there and reducing the cross section that he could equalize the loss of water at Lock 24 and maintain a depth over his proposed compensation works of about 20 feet. What have you to say about that?

Mr. STEWART. To restore that 1.53 feet that I speak of I think that my figures show that it would be necessary to have the embankment high enough to give only a clearance or a draft of 15.7 feet instead of 20 feet.

Mr. TAWNEY. At the place where it is proposed to construct this submerged weir?

Mr. STEWART. Yes, Mr. Tawney; that means full compensation for the 1.53 feet.

Mr. KEEFER. So as to leave things in their normal state?

Mr. STEWART. As I understand Mr. Lea's data, it was proposed to put in some filling on the sides of the river.

Mr. KEEFER. What is the effect of that?

Mr. STEWART. That would of course allow the crest of the submerged weir to be lowered slightly, but I do not think it would be very great, because the flow along the sides is not very heavy. In fact I think the curves submitted by Mr. Lea for the velocity along there show that the flow is rather light close up to the shore.

Mr. KEEFER. Then I suppose it is hardly necessary to ask, for it is obvious as to the inadvisability of filling that up to 15 feet, from a navigation point of view, especially looking forward to any future deepening system of navigation. What do you say as to that?

Mr. STEWART. Well, if we went in for river improvement of course the dam at the foot of the rapids, in the vicinity of Lock 23, would raise the water considerably over the present level, and would probably give more than the 20 feet over this weir.

Mr. KEEFER. That is to put a dam across the whole river and canalize the river?

Mr. STEWART. Yes.

Mr. KEEFER. We hope to come to that some day, but apart from that is it advisable or inadvisable, from a navigation point of view, to consider putting in any filling in that river that would bring it up to 15 feet from the surface?

Mr. STEWART. 15.7, with a very low stage of the river; that would give 14 feet on the lock sill. At that time a boat could not go down over the Rapide Plat drawing 14 feet.

Mr. KEEFER. With this weir in?

Mr. STEWART. At the low stage of the river.

Mr. KEEFER. What about the velocity of the water over the submerged weir on the crest of it?

Mr. STEWART. I have not computed that. It would be considerably more than it is at present.

Mr. KEEFER. There would be more drop there?

Mr. STEWART. There would be a drop of 1.53; that would be another pitch.

Mr. KEEFER. Would we have another cellar. I do not like these underground passages.

Mr. STEWART. I do not know whether a cellar would be created, but there would be another Hog's Back there.

Mr. KEEFER. Do you happen to know anything as regards the preliminary work that has been done by the Montreal water levels commission? State to the commission what the Montreal level commission is.

Mr. STEWART. Some three of four years ago the department of marine and fisheries decided to make some investigation into the effect of the various works in the St. Lawrence River, and at other places upon the navigable depth. It was noticed that dredging an additional 4 feet did not improve navigation by that amount.

Mr. MIGNAULT. Dredging where?

Mr. STEWART. In the ship channel of the St. Lawrence River below Montreal. This commission was appointed by order in council and it was composed of Eugene Haskell, dean of the faculty of civil engineering, Cornell University, Mr. Cowie, chief engineer of the Montreal harbor commission, Mr. Forneret, superintending engineer of the ship channel between Montreal and Quebec, and myself. We have been engaged all this time in investigating this matter and our report is pretty nearly ready for presentation to the minister. A good many suggestions have been thrown out for restoring to the ship channel the water that has been lost, and one of the points taken up was the question of improvement in the supply of the river, or rather, improvement of the low-water supply. Our engineer made an exhaustive study of the discharges from Lake Ontario, and he found that by controlling the outflow the minimum discharge could be increased from 194,000 c. f. s. to 210,000 c. f. s. giving an additional 16,000 c. f. s. to the St. Lawrence River, which would mean very nearly an additional foot to the navigable depth.

Mr. KEEFER. I think the International Joint Commission should stand seized of the facts in this case, because they will have many applications come up, and it will be advisable to have the data before them. You have a copy of this report?

Mr. STEWART. Yes.

Mr. KEEFER. You will put it in?

Mr. STEWART. Yes.

Mr. MIGNAULT. How many copies have been printed?

Mr. STEWART. This is only one typewritten copy that has been prepared for this investigation.

Mr. KEEFER. This is a very important matter affecting the whole navigation of the St. Lawrence River. The report by the engineer covers four and a half typewritten pages, and there is a report of Mr. Cowie, of the Montreal harbor commission, extending over four pages. This report is on the regulation of Lake Ontario.

Mr. MIGNAULT. How far is it pertinent to this inquiry?

Mr. STEWART. It is pertinent in this way that the proposed regulating works would probably be situated in the vicinity of Morrisburg.

Mr. KEEFER. That is the regulating dam?

Mr. STEWART. Yes; when the full development of the river takes place.

Mr. MIGNAULT. Could you describe the proposed regulating works?

Mr. STEWART. This is a study of what could be done if the water were controlled.

Mr. MIGNAULT. And there is a suggestion that regulating works should be put in the river about Morrisburg?

Mr. STEWART. About that. I do not want to come here and say that regulating works will be put in and regulations adopted. I got the permission of the department to have this report made up to show what a study of the situation meant.

Mr. MIGNAULT. In connection with the regulating works was it suggested that there could be a power development?

Mr. STEWART. That matter has not been considered.

Mr. MIGNAULT. I presume the two could go together?

Mr. STEWART. There is no doubt in my mind that that could be done.

Mr. POWELL. What would be the head for the power?

Mr. STEWART. Whatever head could be obtained between Morrisburg and Lake Ontario; I do not know what that is; it would have to be studied.

Mr. TAWNEY. And this report is, I suppose, made in the interests of navigation entirely.

Mr. STEWART. Yes; practically the same as the control we have at Lake Superior.

Mr. MIGNAULT. And, incidentally, it would be of benefit for power purposes.

Mr. STEWART. Yes.

Mr. TAWNEY. It would depend in part on their excavation.

Mr. MIGNAULT. I know, but that would be an incidental effect of the construction of their regulating works.

Mr. POWELL. What do you think the head would be?

Mr. STEWART. It would be something in the vicinity of 15 feet. In connection with this regulation it would be necessary to have a full command of the discharge from the river. This proposed power scheme, as I understand it, limits the discharge of the Little River to 30,000 c. f. s. It becomes necessary to look after the level of Lake Ontario, in the interests of navigation, and at high water the Little River discharges far more than 30,000 c. f. s.; it may be improved to discharge 45,000 c. f. s. That would be a very serious matter in connection with the regulation.

Mr. VAN KENNEN. Not serious to us; it would help us.

Mr. STEWART. I am not looking after your interests, Mr. Van Kennen.

Mr. VAN KENNEN. We would be very glad to have you regulate it, if you will.

Mr. STEWART. The granting of this application would seem a curtailment of the elasticity of control. The commission will remember that at Lake Superior the original scheme was for regulating works by 12 gates, and the number was afterwards increased to 16, to give greater elasticity, and this would be a similar case in which part of the control would be reduced; at least the quantity through the Little River would be reduced.

Mr. POWELL. In other words, the 12 gates were not sufficiently responsive.

Mr. STEWART. That is what we found in the Lake Superior case and I think in this case the natural channel, with only 30,000 c. f. s. through the Little River, would act in the same way and might be injurious to the level of Lake Ontario.

Mr. MIGNAULT. Will you file that report of the Montreal water level commission?

Mr. STEWART. Yes.

Mr. MIGNAULT. It may be copied into the notes.

(The report of Mr. Frederick W. Cowie, commissioner, Montreal water level commission, to Mr. Stewart, and the report of Mr. A. J. Matheson, engineer to the Montreal water level commission, follows:)

MONTREAL WATER LEVEL COMMISSION,
Montreal, August 2, 1918.

DEAR MR. STEWART: In view of the request from the counsel for the Dominion Government with reference to application to the International Joint Commission by the New York & Ontario Power Co. for approval of plans to reconstruct and repair dam, hydraulic structures and water-power property at Waddington on St. Lawrence, I would suggest that it is imperative on the part of the Montreal water level commission to place in the hands of the Dominion Government counsel the following information:

1. By order in council, dated 12th June, 1915, a board of commissioners, composed of Mr. Eugene Haskell, dean of the college of civil engineering, Cornell University; Mr. W. J. Stewart, hydrographer, department of the naval service; and Mr. Frederick Wm. Cowie, chief engineer, harbor commissioners of Montreal, was appointed to make a thorough examination and report upon matters vital to successful navigation in the St. Lawrence and Montreal harbors as follows:

"7. Probable effect of any increased diversion of water from the valley of the St. Lawrence and Great Lakes.

"8. Probable effect of storage dams in the Ottawa River.

"9. If deemed advisable, the board may make suggestion, * * *."

The Montreal water level commission have made a very thorough investigation and it is expected that their report will be in the hands of the Government by the end of the present year.

This report, after investigation and study, will summarize as follows:

(7) The diversion or increased diversion of water from the valley of the St. Lawrence and Great Lakes is a matter of absolutely vital importance to navigation of the St. Lawrence and Montreal harbor.

(8) The expected beneficial effect of the storage system established on the upper Ottawa is very doubtful of being realized. The manipulation of these storage units is being carried out more in the interests of lumbering operations and water power interests than in the interests of navigation. Unless the manipulation of this system is controlled by a board having navigation interests of at least one-third the full representation, it is feared that the water stored in this system will be allowed to flow early in the summer for logging benefits, when not required for navigation levels or in winter for water powers, when navigation has ceased.

(9) The Montreal water level commission have considered every possible phase in connection with the amelioration of the water level for navigation purposes on the St. Lawrence and in Montreal harbor, and no possible suggestion has been found to give equal or anything like equal results as a proper system of regulation of the flow from Lake Ontario.

A consideration and study of this most important question has resulted in a demonstration of the following:

1. Such a system of regulation may be designed and constructed, which will improve and make more uniform, the levels of Lake Ontario.

2. The construction of such regulating works would greatly minimize floods resulting from ice jams in the upper rapids.

3. The design and operation of such regulating works would very greatly enhance the value of the great undeveloped water powers on the St. Lawrence, between the head of the St. Lawrence rapids and Montreal, by ameliorating frazil troubles and by giving a more regular flow of water.

4. The demonstration which the Montreal water level commissioners wish to place upon record is the improvement of water levels, which such a system would at the outset provide. The improved effect of the level of the River St. Lawrence at Sorel will be about 1 foot; in the basin of Montreal harbor it will be still more.

It is unnecessary to reiterate the importance of the development of the magnificent water powers now largely going to waste on the St. Lawrence. It is generally accepted that as soon as ways and means can be devised whereby these powers may be safeguarded and utilized to the general benefit and as soon as capital is available, that a general system of power development must be speedily inaugurated by the authorities having interests therein.

It is also of importance that the great navigation interests of the St. Lawrence, between Lake Ontario and Montreal, should be taken into consideration, and it has been assured that the development of water power and of the canals or waterways system should go hand in hand, the design and construction of the one being quite suitable to the necessary development of the other.

It is therefore of importance that the Montreal water level commission at this date place before the Dominion Government counsel the preliminary demonstration of the engineer of the Montreal water level commission, showing the feasibility of such controlling system of water flow from Lake Ontario.

It is equally important that the Montreal water level commission place before the Dominion Government counsel the importance of advising against increasing at the present time any local vested interest or development within this proposed area of regulation and improvement, which would be rendered in whole or in part useless by the greater development which much come in the near future.

Yours, very truly,

FREDERICK W. COWIE,
Commissioner.

MONTREAL WATER LEVEL COMMISSION,
MONTREAL, QUEBEC, *August 1, 1918.*

W. J. STEWART, Esq.,
Montreal Water Level Commissioner,
Rea Building, Ottawa.

DEAR SIR: As requested in your letter of the 31st July I beg to submit the following summary of conclusions drawn from a preliminary study of the possibility of controlling the discharge from Lake Ontario, and the effect it would have on the levels of the lake and along the St. Lawrence River.

In making this study consideration was given to the effect it would have on Lake Ontario and St. Lawrence River navigation interests, harbor interests, riparian rights and present and possible hydroelectric power developments, with the object of improving conditions for all concerned.

A copy of the proposed regulations are attached hereto. They consist of a table of minimum regulated monthly mean discharge for each month, amounting to 210,000 c. f. s. from January to July, inclusive, raising to 240,000 c. f. s. in October, and lowering to 210,000 in December. It also includes a list of monthly mean water surface elevations which are to be maintained on Lake Ontario, except where this would reduce the flow below the proposed minimum discharge, or increase it above a maximum discharge of 290,000 c. f. s. These elevations are 246 in January and February, gradually increasing to 248.50 in July and decreasing to 246 again in December. The increase from February to July allows for storage of the spring run-off and this storage is used during the low-water supply for the latter half of the year.

This study covers a period of 58 years, 1860 to 1917, inclusive, and probably includes the extreme range of conditions which are liable to occur.

The computations, a copy of which I inclose, are based on gauge records taken on Lake Ontario and the St. Lawrence Canal locks, and on discharge measurements made at three points by the United States Lake Survey from 1900 to 1914.

Discharge curves were computed from this data and the monthly mean discharge used in the computations was obtained from these curves, which are shown on plan 135.

The total supply for each month for Lake Ontario was obtained by adding to or subtracting the volume in the lake represented by the difference in elevation between the beginning and end of each month.

The total monthly mean supply was used as a base for distribution by the proposed regulation and the computation indicates the resulting discharge, and the monthly mean elevation of Lake Ontario for each month during the 58 years.

The effect of the variations in discharge between that obtained from the gauge records and the proposed regulated discharge has been computed for the lower end of Lake St. Francois, at Valleyfield and Coteau Landing, the lower end of Lake St. Louis, at Lachine, Lock 5, and also the St. Lawrence River, at Sorel. These are attached to the other computations.

The results of all these computations are shown graphically in profiles on plan No. 138, the recorded supply, discharge, and elevations being shown in white on blue print and the proposed regulation is indicated in red lines.

I also inclose a blue print of plan No. 145 showing profiles of the river from Lake Ontario to Lachine, the regulated maximum monthly mean discharge of 290,000 c. f. s. regulated minimum monthly mean discharge of 210,000 c. f. s. and the extreme low-water period of November, 1895, with a discharge of 193,000 c. f. s. This last was previous to the opening of the Chicago Sanitary Canal, and under present conditions would be 10,000 c. f. s. lower.

SUMMARY OF IMPROVEMENTS TO BE GAINED BY REGULATION.

The effect on Lake Ontario is to maintain a higher elevation during the seasons of navigation, especially during the years of low supply when the depth of navigation would be increased by an average from 1 to 2 feet. This would be of great advantage to shipping interests, as the number of tons increase in freight capacity of a vessel for each additional foot of draft is approximately one forty-fourth of the length of the vessel multipled by its breadth in feet.

The range in elevation during navigation seasons would as a rule be between 246 and elevation 248.5, except on four occasions when it was down to 245 and once to 244. The low-water datum adapted for the United States Lake Survey charts is elevation 243.

On Lake St. Francis, with the regulated minimum discharge, there would never be less than 15.6 feet on the upper sill of the Soulanges Canal.

Plan No. 145 shows the proposed improved depth on the sills of the Ontario-St. Lawrence Canals.

On Lake St. Louis, at Lachine, the minimum of 13.5 feet on the sill on November, 1895, would be increased 1 foot to 14.5. At Sorel the channel datum is 12.10, but with this regulation the minimum would not be less than elevation 13.

IMPROVEMENT OF POWER INTERESTS.

Instead of the minimum monthly mean discharge of approximately 184,000 c. f. s. of February, 1912, there would never be less than 210,000, an increase of 26,000 c. f. s., or 15 per cent greater, which is an important item when the fall of 250 feet is considered. The maximum regulated discharge will be 290,000 c. f. s., which will tend to give more even run-off during the high period.

If there were a recurrence of the low-supply period of 1895–1897, the Chicago Sanitary District, drawing 10,000 c. f. s. from Lake Michigan, would cause a further reduction in the levels of 1895, and without regulation the navigation capacity of the St. Lawrence River and Canal would be greatly reduced. At Sorel this would amount to half a foot reduction in the depth of the ship channel.

The Chicago Sanitary District started operations in 1900, and in comparing elevations for the period before with those for the period after that date it is necessary to make a reduction for the amount drawn from Lake Michigan.

This proposed regulation was worked out with the idea that the man in charge would have no indication of the probable amount of supply coming into Lake Ontario, and it is merely a rule of thumb. Under present conditions, now that it is possible to compute the approximate discharge from each of the upper lakes and to make a fair estimate of the local run-off, based on weather reports and past experience, it would be possible to make great improvement in this regulation and to maintain a very much more even flow throughout the year.

The object of this study, which was intended to demonstrate the possibility of great general improvement in conditions for all interests by controlling the discharge from Lake Ontario, has, I consider, been satisfactorily accomplished.

A. J. MATHESON,
Engineer to the Commissioners.

Inclosures to accompany summary of report on possible control of Lake Ontario, dated August 1, 1918.

Rules and computations for proposed regulation, and also computed monthly mean discharges, Lake Ontario, 1860 to 1917.

Plan No. 135 A, showing discharge curves for Oswego, Ogdensburg, and Locks 23, 24, 25, and 27 gauges.

Plan No. 138, rough sketch showing computed discharge and supply of Lake Ontario, recorded elevations for Lake Ontario, Lake St. Francis, Lake St. Louis, and at Sorel, also the proposed regulated discharge and resulting elevations at four gauges taken from actual record.

Plan No. 145, profile of River St. Lawrence, Kingston to Lachine, from monthly mean low-water record, November, 1895, and the profile for maximum and minimum proposed regulated discharge.

Mr. KEEFER. Coming along to another point, to which Mr. Lea referred about the potential development of hydraulic power at this point, I think he said something about 300,000 horsepower as the total estimate of the development of horsepower there.

Mr. STEWART. I do not think any of us know exactly how high the water can be raised at Morrisburg. I do not know of any study that shows how far the backwater would go up the river. I am only making a guess when I say 15 feet; I do not know whether it would go more than that or not.

Mr. KEEFER. Taking 15 feet as the basis, what would it give as an estimate?

Mr. STEWART. The regulated outflow at 15 feet would be about 300,000 horsepower.

Mr. KEEFER. And that, of course, would involve a dam from shore to shore and the canalization of the river?

Mr. STEWART. Yes.

Mr. KEEFER. And, naturally, the canalization of the river would practically be a preferable scheme rather than a canal at the side at that point?

Mr. STEWART. Yes.

Mr. MIGNAULT. Could you make a guess at the cost of such regulating works?

Mr. STEWART. No; that is a little bit out of my line.

Mr. KEEFER. Now, the next point I would like to examine you on is the natural flow of the river. Perhaps we had better leave that to Mr. McLean, but having touched it, I will ask you a few questions. What do you know about the natural flow of the river; can you supply any information to this commission on that?

Mr. STEWART. Are you speaking of the Little River?

Mr. KEEFER. Yes.

Mr. STEWART. We have already stated the natural flow of the river.

Mr. KEEFER. I mean the Little River.

Mr. STEWART. Well, when I came to the question of determining the natural flow of the Little River I had no information of my own, so I took up the original blue print of the survey work carried on by the United States Lake Survey a few years ago, and I found the intake blocked up with a lot of very shallow soundings, and it gave me no information as to the size of the cross section. I wrote to the superintendent of the Lake Survey at the time and asked for any information they had, and I got a reply that they had none; that they had made no detailed survey of that piece of river. I was then com-

pelled to look up the only information available, namely, the cross section supplied me by the applicant. I had no reason to suppose that these cross sections were otherwise than the depth in the river at the present time, as we would go there with a leaded line or a rod and take the depth. Of course, I have learned since.

Mr. KEEFER. Where did you learn since?

Mr. STEWART. At this hearing I have learned that the engineers used a rod and pushed it down through the upper part of the soil until they struck hard bottom, which would, of course, give a much larger cross section than I would get if I went there to-morrow. Using the cross sections that were supplied me I computed the discharge in the Little River under natural conditions, and when I plotted the cross section and checked up my results with Mr. Lea's results, I found that at low water I had exactly the same, at mean water the discharges were about 1,000 c. f. s. less, and at high water I had the same amount as Mr. Lea.

Mr. KEEFER. Practically, you agree with Mr. Lea, provided your original data is correct.

Mr. STEWART. On the data supplied me I was surprised to find so close an agreement.

Mr. KEEFER. If you were asked to furnish this commission with the natural flow of this river, what would you require before you could do so?

Mr. STEWART. In view of what has taken place now, I should like to have an examination made of the cross sections as they exist to-day.

Mr. KEEFER. In order to make a more accurate statement?

Mr. STEWART. Yes.

Mr. KEEFER. But with the data furnished you do not differ.

Mr. STEWART. We do not differ. But if there is a foot of silt that has not been taken into account and stops the flow, the cross sections would be considerably reduced and the discharge would be reduced from 1,500 to 2,000 c. f. s. with a foot of silt.

Mr. KEEFER. There is another point on which I would like to ask you a question. You know we have in Canada—I think it is true also of the United States, especially with the great demand for coal now-a-days—a desire to get the potential energy of this river developed. Where would the first development logically have to be if you are going to develop the St. Lawrence River and get all the white coal out of it; where would your dam be? Would it be down at the Montreal end or up toward Lake Ontario?

Mr. STEWART. I would commence at the upper end.

Mr. KEEFER. Give your reasons why.

Mr. STEWART. I would begin at the upper end, of course, to drown out the upper rapids first, so that in the winter months there would be no frazil ice formed.

Mr. KEEFER. And frazil ice always accompanies rapid water.

Mr. STEWART. Yes.

Mr. KEEFER. Then, from an engineering point of view, you think it advisable to begin where the rapid waters begin and work down stream?

Mr. STEWART. Yes; drown out the upper rapids first.

Mr. KEEFER. And it has been mentioned here just now by Mr. Perkins, there is the additional reason for the control of Lake Ontario.

Mr. STEWART. Of course, that would have to be controlled by the powder dam.

Mr. KEEFER. Then the control, I take it, of the first devolpment of power, with that thought in view, could be at that point.

Mr. STEWART. I would say so.

Mr. MIGNAULT. What do you mean at this point.

Mr. STEWART. In the vicinity of Canada Island.

Mr. KEEFER. Looking at this problem, not from the power point of view but from the navigation point of view, before any diversion should be permitted, if I understood your testimony, there should be compensation on account of the effect on the levels—is that right—first of all?

Mr. STEWART. Absolutely necessary.

Mr. KEEFER. Then, as to what these compensating works are, that could be better dealt with as plans, etc., are provided that will show exactly what they proposed to do. You can deal with that then. For instance, you have no plan of the submerged weir.

Mr. STEWART. No; but I think I know enough about it to say that a submerged weir could be put in and could be made to raise the water to any extent up to within reason.

Mr. KEEFER. Now, we have heard a great deal about the danger to navigation of the reef between Canada Island and Ogden Island and the benefit it would be to navigation by building this dam from Canada Island to Ogden Island. Have you ever had any complaint coming in from the navigation interests that would lead you to think that a dam ought to be built there from the navigation point of view only?

Mr. STEWART. I have not heard of any; I do not say that none have come in. They would not come before me; they would come before the department of public works.

Mr. KEEFER. The benefit of that, if I understand the testimony aright, would be that if a boat gets out of control she would go straight down the river instead of on the reef and probably get into trouble below. If the embankment were there she would not get on the reef but would go on down.

Mr. STEWART. She would be shot down there.

Mr. KEEFER. You do not know of any accident that has happened to a steamer there?

Mr. STEWART. I do not know anything about it. I have no evidence to offer on that point.

Mr. KEEFER. The effect of that dam on navigation, then, would be to prevent any boats side stepping across, but it would send her a little more quickly straight down the channel.

Mr. STEWART. Yes.

Mr. KEEFER. What would be the increase in the current?

Mr. STEWART. With a flow of 194,000 c. f. s. through there now it is 7.2 feet per second, and with the embankment in place it would be between 9½ and 10 feet a second.

Mr. KEEFER. What increase would that be per mile per hour in the current.

Mr. STEWART. About 2 miles.

Mr. KEEFER. Is there anything else you think should be laid before the commission in this matter that I have not asked you.

Mr. STEWART. I can not say that there is anything; probably counsel may ask me something else in cross-examination.

Mr. MCLEAN. Did I understand you to say that with reference to computing natural flow of the Little River, and taking into consideration the testimony here with respect to the data on which that computation had been made, that before giving your opinion as an expert as to what the natural flow of the river is, you would feel that a further examination and further data were necessary. Do I understand that to be your position?

Mr. STEWART. I think so, in view of the evidence that has been offered since I came here.

Mr. MCLEAN. Did I understand you to say that you found obstructions at the intake of the Little River? Have you made any physical examination of the intake of the Little River.

Mr. STEWART. I have not.

Mr. MCLEAN. Then I misunderstood you.

Mr. STEWART. I was saying that looking at the original blue print as supplied by the Lake Survey people, their own survey, I found the channel with very shallow soundings; in fact there were no soundings at all, they were nearly all crosses, and it gave me no information. I wrote for further data and they had nothing to supply.

Mr. KEEFER. As regards this material that would be lying in the river bed there, for instance bowlders, and so forth, I have heard the statement made that it is likely these were deposited by ice. It is possible that these bowlders would be brought down there by ice into that still water?

Mr. STEWART. Almost anything is probable, but I would like to see it first.

Mr. KEEFER. You are from Missouri.

Mr. STEWART. Yes.

Mr. KEEFER. Evidence has been given that that dam was there for 110 years.

Mr. STEWART. Yes.

Mr. KEEFER. It is reasonable to suppose that with the slack water that is there that the ice would bring any bowlders there?

Mr. STEWART. I do not think it would be possible, but the engineers state positively that is so, and they have seen it.

Mr. KEEFER. You engineers seem to like to back up each other's statements; you are not like lawyers.

Mr. STEWART. Here is the positive statement that they have seen that, and I have not seen it, but I may say that I would not believe it until I heard it given in sworn testimony.

Mr. KEEFER. We are not questioning whether they are there or not there, but as to the inference of their being brought there by the ice.

Mr. STEWART. I would feel very skeptical about that.

Mr. KING. There are three points I wish to mention to you, Mr. Stewart. You said that at the low stage of the river with a flow of say 194,000 c. f. s. the velocity at Canada Island might increase about 2 miles per hour under the new conditions.

Mr. STEWART. That is the mean velocity.

Mr. KING. Taking the mean or various velocities across the river?

Mr. STEWART. Yes. That is computing the velocity by taking the cross-sectional area of that channel and dividing it into the discharge.

Mr. KING. So that coming downstream the velocity in this stream would be considerably higher than that.

Mr. STEWART. It would.

Mr. KING. Taking a stage of the river represented by a flow equal to 222,000 c. f. s., spoken of in Mr. Lea's evidence, would the increase due to the proposed works be greater or less?

Mr. STEWART. Not very different. With a flow of 221,000 c. f. s. the mean flow at present is about 7.25 feet per second.

Mr. KING. And what would it be under the new conditions?

Mr. STEWART. Under the new conditions it would be between 9 feet and 9½ feet per second; that is, the mean flow.

Mr. POWELL. Respectively, how many miles?

Mr. STEWART. Six and a half miles an hour, about, in one case and about 5 miles an hour in the other.

Mr. KING. With regard to the submerged weir, you suggest that, in your opinion, it would require to be built to a height perhaps 15 feet below the surface of the water.

Mr. STEWART. 15.7 at very low water.

Mr. KING. And that would give a drop or pitch of what?

Mr. STEWART. One foot and a half.

Mr. KING. I suppose that would bar out all navigation?

Mr. STEWART. The pitch now is——

Mr. KING. You do not navigate the pitch now.

Mr. STEWART. At all events, a foot and a half is a good deal more than the present pitch.

Mr. KING. And you heard the evidence of the navigators that they do not go up the pitch itself in the rapids?

Mr. STEWART. They dodge it; they would not be able to dodge the other.

Mr. KING. Perhaps it would extend across the river.

Mr. STEWART. Yes.

Mr. KING. One more point: The gauges in the rapids are how many in number?

Mr. STEWART. Including the one at Canada Island, there are 9 along the canal bank.

Mr. KING. These are not gauges established by the Government?

Mr. STEWART. No.

Mr. KING. These are Mr. Tucker's?

Mr. STEWART. Yes; put in by the applicants.

Mr. KING. Have you seen them yourself?

Mr. STEWART. I have not.

Mr. KING. Do you know whether they are in the river or on the shore?

Mr. STEWART. I do not know.

Mr. KING. There is quite a difference between a gauge in a stream, subject to fluctuations of the stream, and a gauge in a concrete block on the shore.

Mr. STEWART. There would be along a rapid like that.

Mr. KING. You have no personal knowledge of this particular place?

Mr. STEWART. I have no personal knowledge.

Mr. KING. A question has just been suggested to me, and I think I may ask you with reference to it. The evidence of the navigators

given yesterday you have heard; have you any comment to make as to the way in which they decide to run the Rapide Plat?

Mr. STEWART. I have not; only I think it is a perfectly rational way. Some of the navigators said that they never looked at the gauges. It does not make any difference whether they look at the Government gauges or whether they have some other mark on the shore that they go by; it is the same thing. All down the River St. Lawrence the Government establishes semaphores that notify the pilot coming along whether the tide is at a proper height before he can pass a certain point; it is just about the same thing.

Mr. KING. And you know some such information as that is absolutely necessary in connection with the navigating of a boat downstream.

Mr. STEWART. Absolutely.

Mr. KING. Do you agree as to the difficulties of entering the head of the Morrisburg Canal?

Mr. STEWART. I have not noticed so much difficulty at the head of the Morrisburg Canal. I have seen some difficulty in the north channel.

Mr. KING. You are not familiar yourself with the method of navigating down at Morrisburg.

Mr. STEWART. Except that I have seen steamers stranded on the sill of the lock. I have seen boats on the bottom. I was running the Rapide Plat in a launch and these fellows were stuck in the canal.

Mr. POWELL. You have not touched on one thing at all, and I direct your attention to that fact. You have not spoken about the advisability or nonadvisability of some general scheme of development as against developing this by pieces and subsequently developing the balance.

Mr. KING. I think Mr. Keefer touched on that point.

Mr. STEWART. I thought there was some little reference to it; of course, the Government has all this on record.

Mr. POWELL. I am not speaking about the Government; I am speaking about your own view. What is your view of the correct development of the power of the river.

Mr. STEWART. My own view is that there should be one development on the river to get as much spillway as it is possible to get on the largest section in that vicinity of the river; I think it would be necessary to build it above Canada Island. I do not see any other place else there. It should go right across to Clark Island on the north shore.

Mr. POWELL. What would you do with the Little River?

Mr. STEWART. I would not develop the Little River at all. I would put this dam in and blow out the dam on the Little River, buy it out as was proposed, I think, by the Deep Waterways Commission.

Mr. POWELL. When did they propose to do that?

Mr. STEWART. Some years ago the United States Government had a commission called the Deep Waterways Commission studying the project for a canal all the way from Duluth to New York and they reported that that power plant would have to be bought out. I think their canal came down through there.

Mr. POWELL. Where is that report to be found?

Mr. STEWART. It is the report of the Deep Waterways Commission in 1900; I see it there in the bookshelf.

Mr. TAWNEY. The Deep Waterways Commission was a national commission.

Mr. STEWART. Yes; a United States commission.

Mr. TAWNEY. Was it national or international?

Mr. STEWART. National.

Mr. POWELL. Mr. Lea proposed a scheme of development which perhaps would be linked up with this other. What is your idea of that?

Mr. STEWART. I am not as sanguine as Mr. Lea is that that would get the most efficient use of that amount of water. I think the discharge of 30,000 c. f. s. down the Little River would raise the water in the tailrace above what it is at present. The dam that would be necessary for his scheme would run from Clark Island to Ogden Island and extend up to their proposed dam, and there would be quite a discharge from this into the tailrace at their plant, reducing their head still further.

Mr. POWELL. Would your scheme afford sufficient extension for your development in the way of wheels?

Mr. STEWART. I think so.

Mr. POWELL. Would you get a dam long enough there to accommodate all the wheels necessary.

Mr. STEWART. I think so.

Mr. POWELL. Or would you run it diagonally upstream in order to get that accommodation?

Mr. STEWART. I have not studied the details enough to speak as to that, but it can be arranged without any difficulty.

Mr. POWELL. So far as head is concerned, what would be the distinction between your scheme and their scheme as a separate scheme?

Mr. STEWART. With that proposed scheme, or the Government scheme, if I might call it so, there would be much greater head than you have at present at Waddington. The plans of the applicants would have to be modified to take care of this extra head, because the water would be raised at the intake 4 or 5 feet. That is a rough guess; I do not know exactly what the head is.

Mr. MAGRATH. Have you given this matter sufficient study to speak authoritatively?

Mr. STEWART. Along the lines I am talking; yes.

Mr. MAGRATH. You differed with Mr. Lea and said you did not agree with him as to the maximum development.

Mr. STEWART. Yes; I have thought of that since and my idea is that the tailrace would be affected considerably.

Mr. TAWNEY. On this question I would like to ask you something in reference to your opinion just expressed in answer to the question put to you by Mr. Powell, with respect to the general development being preferable to the development of individual power; that, I suppose, applies not only to this case in the Little River, and this application, but to all other possible power development on the St. Lawrence.

Mr. STEWART. It does.

Mr. TAWNEY. It is not confined exclusively to this case?

Mr. STEWART. No.

Mr. POWELL. That is a general policy?

Mr. STEWART. A general policy.

Mr. TAWNEY. You think that should be a general policy?

Mr. STEWART. I think so.

Mr. TAWNEY. What undeveloped water powers are there in the St. Lawrence River that are wholly upon the Canadian side, that are undeveloped, or are there any?

Mr. STEWART. Do you mean in the St. Lawrence River between Cornwall and Prescott?

Mr. TAWNEY. Yes.

Mr. STEWART. I do not know of any.

Mr. TAWNEY. Then the result of this policy would be to discontinue all individual power development on the American side until the two Governments could unite on a general international policy for the canalization of the river and the development of power that is international.

Mr. STEWART. I think we could very well afford to do that; this is a small development.

Mr. TAWNEY. That is your opinion; that the individual power development on the American side could afford to wait the pleasure of the two Governments with respect to the general development scheme that you have just spoken of?

Mr. STEWART. I think the general public could afford to wait; I am not very sure about the power companies.

Mr. TAWNEY. The owners of the property on the American side?

Mr. STEWART. I am not speaking about the owners of the power development; I am speaking about the general public. The people would have to pay for it eventually.

Mr. TAWNEY. This proposed general development scheme that you speak of here, for the regulation of Lake Ontario, is that regulation necessary for the purpose of regulating the level of Lake Ontario under natural conditions, or is such regulation due to the proposed development of navigation and power purposes on the St. Lawrence River below the locks?

Mr. STEWART. I do not understand the point.

Mr. TAWNEY. I will put it in this way: Is the control of Lake Ontario for the purpose of improving these present natural conditions or for the purpose of meeting new conditions caused by obstructions in the river below, for the improvement of navigation and the development of power?

Mr. STEWART. The proposed regulation is for the benefit of navigation.

Mr. TAWNEY. Is such regulation necessary at the present time for the purpose of regulating the level of Lake Ontario?

Mr. STEWART. Just to regulate Lake Ontario—for no other purpose but for the improvement of navigation in the St. Lawrence River—which is highly desirable. It is one of the most necessary things to be done for the future development of the St. Lawrence River.

Mr. TAWNEY. Then the regulation would be due to the proposed development of the St. Lawrence River in the interests of navigation?

Mr. STEWART. The study that we have made is for the improvement of navigation in the St. Lawrence River below Montreal. That is the study this report shows.

Mr. TAWNEY. Below Montreal?

Mr. STEWART. Yes. We want on the Canadian side to get as big a draft as we can, so that we can bring large vessels to Montreal in the fall of the year when the water is low and take our maximum loads. It would be a great thing if we could get a larger draft there than there is at the present time.

Mr. TAWNEY. How do you accomplish that?

Mr. STEWART. One of the things that could be done would be to improve the low-water flow. You know that a few years ago the city of Chicago built a canal from Lake Michigan to the Des Plaines River and are exacting about 8,000 or 9,000 c. f. s. That has lowered the water in the St. Lawrence River some 6 or 7 inches, speaking approximately, below Montreal. We would like to get that water back.

Mr. TAWNEY. As I understand you, the object of the Montreal water level commission is for the purpose of improving the low-water conditions in the St. Lawrence River below the city of Montreal.

Mr. STEWART. That is their primary function.

Mr. TAWNEY. And to accomplish that your report recommends, does it, the improvement at or near the lower end of Ogden Island, which you have mentioned?

Mr. STEWART. We do not state the locality. We will recommend the control of the outflow of Lake Ontario.

Mr. TAWNEY. But the control of Lake Ontario would not be necessary if it were not for the purpose of improving the low-water conditions below Montreal.

Mr. STEWART. Not at present.

Mr. MIGNAULT. And that is of paramount importance?

Mr. POWELL. Mr. Stewart, would or would not the development of this individual power affect detrimentally the development of the balance of the power at this particular portion of the river?

Mr. STEWART. I think it would.

Mr. POWELL. Is that a matter of mature judgment or simply as good a speculation as you can make at the present time?

Mr. STEWART. I have given it a good deal of thought. I have given the whole problem a great deal of study. I think it would be a mistake to go on with this development now.

Mr. POWELL. Take the scheme propounded by Mr. Lea. Would that result in just as efficient development of the water on the Canadian side as your scheme? I am looking at the Canadian side in what we might call the international portion of the river.

Mr. STEWART. I stated a few moments ago that I thought it would not.

Mr. POWELL. I am not directing attention to the United States side at all.

Mr. STEWART. You are taking it as a developed stream?

Mr. POWELL. Yes; looking at the development of the stream by itself.

Mr. STEWART. I do not think that if a company came along to put in a development in the St. Lawrence River to-morrow they would put in such a scheme as Mr. Lea suggests; that is, come across there and turn into Ogden Island, and then dam the Little River. I think the dam would go all the way across the Little River.

Mr. POWELL. And assuming for purposes of argument, so to speak, that Mr. Lea's scheme would not be the most efficient scheme of development on the American side, would that fact interfere in any way with the efficiency of the development in the international channel? Do you understand me?

Mr. STEWART. No; I do not catch the drift of that.

Mr. POWELL. Well, are the two so linked together that the efficiency of development in the international channel could not be effected in accordance with Mr. Lea's scheme?

Mr. STEWART. No; it would not affect the development of the balance of the water. I am speaking only of the full development of the whole river. If this scheme goes in, I do not think it would affect the efficiency of the development of the balance of the water.

Mr. KEEFER. What would happen to this if that were done? Would you have to scrap this?

Mr. STEWART. Not necessarily, but I think it would affect the tailrace. They are putting in this embankment to improve the tailrace. If you spill the water down into it, you are killing the improvement.

Mr. POWELL. Let us assume that the United States would say, "This is our own individual power on this side of the river. We can do as we like with it, and we are going to do as we like with it, subject to approval, of course, of the commission." Could you reply to them by saying, "Yes; but doing as you like with yours is going to impair the efficiency of the water of the international stream?"

Mr. STEWART. I would not say so.

Mr. KEEFER. I think we have dealt with that in our answer, with the full development. We say in subparagraph O, page 6, of the answer of Canada, "With such a scheme the water at the head of the intake to applicant's canal will be raised about 4 feet, completely submerging the proposed works." If this dam to regulate Lake Ontario as proposed is put in, not only would you affect the tailrace, but you would affect these works at the intake, would you not? You would raise the water, would you not?

Mr. STEWART. I do not quite catch the drift of your question.

Mr. KEEFER. If you put in a regulating dam in Lake Ontario, you are going to raise the water to the level of Lake Ontario, are you not?

Mr. STEWART. I expect so.

Mr. KEEFER. You drown out the Galops Rapids?

Mr. STEWART. Yes.

Mr. KEEFER. That will be an improvement to navigation?

Mr. STEWART. Certainly.

Mr. KEEFER. The whole river down to this point, so far as navigation is concerned, is decidedly improved?

Mr. STEWART. Yes.

Mr. KEEFER. You would necessarily raise the water at the head of Ogden Island some 5 feet?

Mr. STEWART. Yes.

Mr. KEEFER. Roughly speaking, what would that footage be?

Mr. STEWART. I stated in the main part of my evidence that I did not know exactly how much it would be raised, but I thought about 5 feet. No study has been made of that point.

Mr. KEEFER. Naturally, that would affect these proposed works, would it not?

Mr. STEWART. Certainly.

Mr. KEEFER. It would drown them out?

Mr. STEWART. Not necessarily. They could raise their dam or make provision for that.

Mr. GARDNER. You would not object to raising the dam, would you?

Mr. VAN KENNEN. Not at all. It would give us more control.

Mr. KEEFER. We just want to get all the data before this commission so they can grapple with the problem. Mr. Stewart, if you had that regulating dam for Lake Ontario would you be able to avoid the use of the Gallops Rapids Canal?

Mr. STEWART. It is called the Iriquois Canal or the Cardinal Canal.

Mr. KEEFER. Would you practically eliminate that?

Mr. STEWART. Practically, yes.

Mr. KEEFER. That is a decided advantage to navigation?

Mr. STEWART. Yes.

Mr. KEEFER. They could come straight down the river in still water?

Mr. STEWART. Straight down; one lock.

Mr. KEEFER. Now, the United States have property rights in the St. Lawrence River, I believe, to the sea. All these improvements we are discussing would be a benefit to the United States as well as to ourselves?

Mr. STEWART. Certainly.

Mr. KEEFER. But, vitally, it is our artery to the sea?

Mr. STEWART. They have a small amount of traffic below Morrisburg.

Mr. KEEFER. But they have a right to use it at any time?

Mr. STEWART. Straight through to tidewater.

Mr. KEEFER. So anything we are doing is not to their detriment, but if they wish to use it it is to their benefit?

Mr. STEWART. Yes.

Mr. TAWNEY. Mr. Stewart, you said a moment ago that there are no undeveloped water powers wholly on the Canadian side of the St. Lawrence River between Cornwall and Prescott.

Mr. STEWART. I do not know of any.

Mr. TAWNEY. Are there any developed powers?

Mr. STEWART. Only in the canals. Each canal has a small development at the lower end of it. There is one at Iriquois, one at Morrisburg, one at the lower end of Sheek Island along the Cornwall Canal, and two or three below that taking water from the canal.

Mr. TAWNEY. When was the Morrisburg Canal constructed?

Mr. STEWART. I think the first was constructed about 1844—the old one.

Mr. TAWNEY. What was its depth?

Mr. STEWART. The depth on the sill was 9 feet. The depth of the present canal is 14 feet.

Mr. TAWNEY. The present depth on the sill is 14 feet?

Mr. STEWART. Yes.

Mr. TAWNEY. When was it enlarged or deepened?

Mr. STEWART. I do not know exactly, Mr. Tawney.

Mr. TAWNEY. About when was it deepened?

Mr. STEWART. Between 1895 and 1900.

Mr. TAWNEY. How much water is drawn from the St. Lawrence River for canal service in the Morrisburg Canal?

Mr. STEWART. I do not know. That would depend on the number of boats being locked through.

Mr. TAWNEY. Do you keep any record of the flow through the canals to ascertain the amount of water that is discharged from the St. Lawrence River?

Mr. STEWART. I do not know whether the department of railways and canals does or not. I did not make any inquiry myself.

Mr. MIGNAULT. Mr. Stewart, do I understand you to say that there is no possible power development in the St. Lawrence River on the Canadian side at the international boundary between Cornwall and Prescott?

Mr. STEWART. I do not think so.

Mr. POWELL. There is one at Sheek Island?

Mr. STEWART. Well, that is a part of the Cornwall Canal.

Mr. POWELL. No; apart from the Cornwall Canal.

Mr. MIGNAULT. Am I correct in stating that any development would be from shore to shore?

Mr. STEWART. Not on the American side, but on our side.

Mr. MIGNAULT. It would have to be an international development?

Mr. STEWART. Yes; you see the boundary line passes on the Canadian side of nearly all the islands.

Mr. TAWNEY. How much water passing through the canal is utilized for power purposes? You say these powers are all in connection with the canals.

Mr. STEWART. I do not know, Mr. Tawney.

Mr. TAWNEY. Are these flows through the canals continuous in order to supply these powers?

Mr. STEWART. To supply the power at the foot they have to be.

Mr. TAWNEY. You do not know anything about the quantity of water that is used nor the amount of horsepower that has been developed on the Canadian side?

Mr. STEWART. I do not. I could very easily get that information for you.

Mr. GARDNER. Do you know how many different plants or structures are being utilized for power purposes on the canal?

Mr. STEWART. There is one at the foot of Morrisburg Canal, one at the foot of Iroquois Canal, and Sheek Island, and there are one or two below that taking a small quantity of water.

Mr. KEEFER. Mr. Stewart, following the questions of Commissioner Tawney, regarding this regulating dam in Lake Ontario and its benefit to navigation, you have spoken of that, but from a power point of view. Would it not be very advisable to control and regulate Lake Ontario?

Mr. STEWART. Certainly.

Mr. KEEFER. You would get not only a fixed, uniform flow, which would be higher than it is now——

Mr. STEWART. Higher than the low-water flow?

Mr. KEEFER. Higher than the low-water flow, and then in addition to whatever that power was that you could develop there would be times when you could use as a peak load your high-water stages by virtue of that dam being there.

Mr. STEWART. Yes; but you might want to have a peak load when you had low water. The main thing is to get the more uniform and larger low-water flow.

Mr. KEEFER. In addition to the interests of navigation, this regulating dam as proposed would be a decided benefit for all the power plants on the river?

Mr. STEWART. It would benefit everyone.

Mr. TAWNEY. I understood you to say, Mr. Stewart, in answer to Mr. Powell's question, that the development here proposed would not necessarily interfere with or affect the full efficiency of the development of the water in the balance of the St. Lawrence River, or in the main channel of the St. Lawrence.

Mr. STEWART. No; but I did state in the main part of my evidence that I consider that the blocking up of the Little River channel would affect the regulation; that is to say, it would not make it so elastic. It would curtail the discharge.

Mr. TAWNEY. The regulation of Lake Ontario?

Mr. STEWART. Yes; it would curtail the discharge and capacity at high water.

Mr. TAWNEY. Do you not think that in any event provision could be made even in the Little River for taking care of the increased discharge from Lake Ontario due to the proposed regulation?

Mr. STEWART. I have not seen the plans, and I do not know whether the river is wide enough to take care of the turbines and the sluice gates that would be necessary to give us this additional 10,000 or 15,000 feet.

Mr. TAWNEY. But if that could be done there would be no objection, even from the standpoint of regulation?

Mr. STEWART. No; it would not affect the regulation.

Mr. PERKINS. Mr. Stewart, there is one point in my mind as to the advantage of this proposed general development which has not been brought out. Could not the pond above the proposed dam, which includes all of Lake Ontario, be used as a pondage space so that instead of the normal development of 300,000 horsepower you could put in a development, providing there were room, to carry peak loads. In other words, could you not utilize the flow intermittently for peak-load development, and make the development, say, 450,000 horsepower, having an average load of 300,000 horsepower?

Mr. STEWART. I would not like to say it would go as high as 450,000.

Mr. PERKINS. Possibly your peak load would not require that.

Mr. STEWART. You might do that when you had a lot of water, but with your natural discharge of 194,000 cubic feet per second you could not use Lake Ontario like that, and then with a high stage you could not go with Lake Ontario above a certain point. Regulation would have to confine you to that limit.

Mr. PERKINS. These are daily fluctuations?

Mr. STEWART. That is the ordinary operation of a power plant.

Mr. PERKINS. Then, your development there would probably be materially above 300,000?

Mr. STEWART. Quite possible. I was talking about the dependable flow.

Mr. TAWNEY. Mr. Stewart, does the draft through the Morrisburg Canal for power purposes at any time interfere with the navigation of the canal?

Mr. STEWART. I am afraid it does at times, but that is very easily remedied by cutting down the plant.

Mr. TAWNEY. Has it any effect whatever on the Hogs Back?

Mr. STEWART. Well, the discharge that goes through there has some effect. I do not know what the amount is. Mr. Lea tells me there are about 1,500 cubic feet per second going through the Morrisburg Canal for navigation and power purposes.

Mr. KING. Mr. Stewart, does your experience not include a knowledge of constant protest from the owners of vessels navigating canals against the establishment of a current in the canal by power plants here and there?

Mr. STEWART. I have heard of that continually, Mr. King. That is a question that is continually coming up.

Mr. TAWNEY. I did not catch your question, Mr. King.

Mr. KING. Mr. Stewart declares his knowledge of constant complaint from owners of vessels as to the occurrence of currents in the canal.

Mr. GARDNER. How long has this water been diverted for power purposes in the canal?

Mr. STEWART. I think they have had a power plant at the end of the Morrisburg Canal almost since the new canals were opened.

Mr. KING. Col. Allison developed one, did he not?

Mr. STEWART. Yes.

Mr. KING. Mr. Powell addressed several questions to you which were followed up afterwards by questions by Mr. Tawney, with regard to the effect as to efficiency of the present proposed development plus the future development of this neighborhood. I myself got a different impression from your answers. I think your answers to those gentlemen have been understood as meaning that if we call X the proposed development and Y the balance, the future development of Y will not be impaired, but that X would be impaired by the development of Y.

Mr. STEWART. I believe so.

Mr. KING. So that the present proposal plus the development of the balance would not be so efficient as the complete development on the whole river at this point?

Mr. STEWART. Yes.

Mr. KING. Have you in view, Mr. Stewart, the preference to be given to one method as to the development of power with incidental remedial works designed, say, for navigation according to what the treaty given them as a paramount right and what at law jurisprudence gives them as a paramount right, or, on the other hand, the development of the river for navigation purposes with the incidental and very desirable development of such powers as can be obtained?

Mr. STEWART. I think the latter.

Mr. MIGNAULT. By the latter you mean what?

Mr. STEWART. I mean the development of the river for navigation purposes, and in that connection put in power development incidentally; the development of every cubic foot of water that can be handled.

Mr. KEEFER. Coming back to the regulating dam and its effect on Lake Ontario, the variation of Lake Ontario is about 5 feet, as I understand it. Is that right?

Mr. STEWART. Approximately, that is right.

Mr. KEEFER. Then, what would be the estimated effect of the regulation on Lake Ontario? What would be the supposed variation?

Mr. STEWART. I think it is about 4 feet. The range is not very much different. But it is an improvement.

Mr. POWELL. Mr. Stewart, this thing opens up big possibilities. Has it ever been in contemplation to utilize the rivers as stretches, utilizing the dams or putting locks in dams and having continuous stream navigation apart from the canals?

Mr. STEWART. Engineers are talking about it. That is what is meant by canalization of the river. In this scheme I suppose a lock would be put in at Canada Island. These side canals would be flooded out and done away with.

Mr. POWELL. Have you given that matter any consideration?

Mr. STEWART. I say that is one of the studies being made. That is what is meant by canalization of the river.

Mr. POWELL. That is a study that is now being made?

Mr. STEWART. Yes.

Mr. POWELL. And that is a study that was made by the commission of the United States that has been referred to?

Mr. STEWART. No, sir. They treated the side canals. They came out into the river in places and went back in. They did not put any dams across the river.

Mr. POWELL. Would not that system be open to the same objection as to the canal, where the water is used for water power? If it is objectionable in the case of a canal to have a current, the same objection could apply to the canalization of the river, because you would always have the current between your dams.

Mr. STEWART. The current in the canals is not the sole objection, but the trouble is that the canal has only a limited draft, and if you start to draw down the boats come down on the bottom.

Mr. POWELL. That is the chief objection there?

Mr. STEWART. The current is always an objection. In the canalization of the St. Lawrence River there will of necessity be a strong current. There is a large flow to come down there and you are going to have it.

Mr. POWELL. That would be the difficult factor in the problem of your canalization?

Mr. STEWART. Yes; but I think it would be better than to go to work and build a canal inland, for instance, and put these big boats in confined waters. They make much better time on both down and up traffic. If they are in the river they have lots of water under them and they have lots of time to maneuver.

Mr. TAWNEY. In answer to Mr. King's question, in which he used the letters X and Y, I understood you to say that the loss in efficiency would be as to the development now proposed and not loss in efficiency as to the development in the main channel of the St. Lawrence River at the foot of the rapids.

Mr. STEWART. In the remainder? Yes.

Mr. TAWNEY. Yes; there would be no loss in the remainder.

Mr. STEWART. I do not think so.

Mr. TAWNEY. So the loss would be wholly on the American side?

Mr. STEWART. Wholly in the present development.

Mr. TAWNEY. And it is in American interests that you are advocating the delay of this project so that when it comes to developing the whole possible power there the United States' side would get more than it otherwise would receive?

Mr. STEWART. That is practically what it amounts to. I was talking about the development of the St. Lawrence River to get the most out of it.

Mr. TAWNEY. But the loss, if any, would be on the American side?

Mr. STEWART. It would be on the American side.

Mr. VAN KENNEN. I do not think that the commissioners have left very much for me to inquire about, but I have a few questions that I want to ask. I understand from you, Mr. Stewart, that you really have not made any very definite study of the situation in and about that region of Ogden Island so as to determine in your own mind positively just where you would project each and every dam or obstruction in the scheme of regulating Lake Ontario.

Mr. STEWART. No.

Mr. VAN KENNEN. So that what you say is predicated upon general knowledge of the situation and is not the result of mature study of it?

Mr. STEWART. The study that I put forward, as far as regulation is concerned——

Mr. VAN KENNEN. No; I mean with respect to how that regulation would be effected at that point.

Mr. STEWART. I have made no study as to the work.

Mr. VAN KENNEN. Have you made any study of the effect which your proposed regulation of Lake Ontario would have upon the adjacent property owners and properties lying between, we will say, Ogden Island and Lake Ontario?

Mr. STEWART. No; that has not been definitely settled yet, either.

Mr. VAN KENNEN. You have not had time to go through this?

Mr. STEWART. No.

Mr. VAN KENNEN. You do not know what property would be destroyed by this elevation of your water in order to attempt the regulation from that point of Lake Ontario?

Mr. STEWART. I only know that it would not be prohibitive.

Mr. VAN KENNEN. You think that?

Mr. STEWART. I know from the contours of the river.

Mr. VAN KENNEN. From your general knowledge you believe that to be so?

Mr. STEWART. I believe it would not be prohibitive at all.

Mr. VAN KENNEN. But, of course, as to the real extent of it you would not want to predicate any opinion?

Mr. STEWART. No.

Mr. VAN KENNEN. Now, in answer to one question with respect to the regulation of Lake Ontario for the purpose of permitting hydraulic development at that point, and to the extent of regulating the peak load, did I understand you to say that it was your opinion as an engineer that you could by the regulation which you have mentioned regulate the water as it approached there to determine the peak load? I mean for practical electrical purposes.

Mr. STEWART. I do not understand your suggestion.

Mr. VAN KENNEN. You made a reply to Mr. Perkins's question that your development could be raised from 300,000 horsepower to 400,000 horsepower by regulating the peak load.

Mr. STEWART. Only at the peak load.

Mr. VAN KENNEN. Can you do that?

Mr. STEWART. By drawing more water. You could draw down more water.

Mr. VAN KENNEN. Well, he asked you about the daily regulation to control your peak load.

Mr. STEWART. I mean to say that he could draw more water into his turbines and have a peak load for a definite time if he had more wheels there.

Mr. VAN KENNEN. Do you mean to say you could do that every day so as to regulate the peak load?

Mr. STEWART. I said at low water he probably could not; but when there is lots of water he could.

Mr. VAN KENNEN. You could arrange that by your regulation so that you could raise the power at that point from, we will say, 300,000 horsepower to 400,000 horsepower at a given hour in the day?

Mr. STEWART. I think you could do it.

Mr. VAN KENNEN. So if you wanted the peak load at 6 o'clock in the afternoon you could have the water there by this system of regulation so that you could raise it from 300,000 to 400,000 horsepower at that hour. Is that right?

Mr. STEWART. I would not say the exact amount, but you could get a very heavy peak load.

Mr. VAN KENNEN. At that hour?

Mr. STEWART. Yes; by drawing down more water.

Mr. VAN KENNEN. How would you arrange it if they wanted the peak load at some other hour in the day?

Mr. STEWART. I was not talking about some other hour. I was talking about this one dam where you had Lake Ontario for a reservoir. You would not have it below here, because it would be shut off by this dam.

Mr. VAN KENNEN. I was getting your idea as to whether, in your judgment, you could daily regulate the peak load by this plan.

Mr. STEWART. I think you could.

(The commission then took a recess until 2 o'clock p. m.)

AFTER RECESS.

The commission reconvened at the expiration of the recess.

Mr. VAN KENNEN. Mr. Stewart, I understood from your testimony with reference to what you call regulating the peak load that you thought with the controlling dam at or near Canada Island you could regulate the peak load at that point somewhat between, we will say, what the normal might be and what a higher requirement for a peak load might be. Was that your opinion?

Mr. STEWART. That was what I think I understood, but it was not the answer to the question put to me by Mr. Perkins, because he put the figures increased from 300,000 to 450,000.

Mr. VAN KENNEN. That would be impossible, according to your view?

Mr. STEWART. That would be impossible, except for a very few minutes. It would not be worth opening up the wheels for any increase like that. I have examined the figures since I spoke this morning.

Mr. VAN KENNEN. That is what I thought at the time, but I did not look at it in quite the same light that you do.

Mr. STEWART. I was not talking about such a large quantity as that. I was just speaking generally.

Mr. VAN KENNEN. We will pass over that. Regarding the diversion in the Little River you have assumed for your calculations as to the effect that it would have upon the elevation of water at Lock 24, 27,000 cubic feet?

Mr. STEWART. An increase in diversion over the present time. As a matter of fact, I used 28,000, but there is not much difference. I did not know what the discharge in the river was, so I used 2,000, and that would be 28,000 cubic feet additional.

Mr. VAN KENNEN. You took that figure as being what you would call the additional diversion over what is being now diverted through that Little River?

Mr. STEWART. Yes, sir.

Mr. VAN KENNEN. Now, the effect on Lock 24 of the additional diversion was what?

Mr. STEWART. I think I put it down as 2 feet. I took it from that blue print of discharges.

Mr. VAN KENNEN. Of course, if the diversion at the present time in the Little River were increased, we will say, to 5,000, it would make a difference?

Mr. STEWART. Yes.

Mr. VAN KENNEN. You would then have to calculate on a basis of 25,000?

Mr. STEWART. I would; yes.

Mr. VAN KENNEN. And, of course, that would lower the water from 2 feet to something below 2 feet.

Mr. STEWART. Yes.

Mr. VAN KENNEN. Taking the same measurement of diversion of the water that Mr. Lea has taken, are you in agreement with him in regard to the amount that it reduces the elevation at that point?

Mr. STEWART. At Lock 24?

Mr. VAN KENNEN. Yes.

Mr. STEWART. I do not know what Mr. Lea's figures are on that point.

Mr. VAN KENNEN. So you can not say whether you are in agreement with him upon the initial lowering of the water at that place, the total lowering?

Mr. STEWART. I did not hear what figures he stated. It is a little more than 1.6.

Mr. VAN KENNEN. Taking the additonal diversion of the Little River on a basis of 27,000 cubic feet instead of 28,000 cubic feet, would you be in agreement with Mr. Lea on that point?

Mr. STEWART. Not when he says 1.6.

Mr. VAN KENNEN. Then, the real point of difference between your figures and Mr. Lea's figures is that you say there would be a greater lowering of the water than stated by Mr. Lea?

Mr. STEWART. Yes.

Mr. VAN KENNEN. You spoke, of course, of one effect of the diversion of this water through the Little River, its additional supply of water, and returning it to the main stream would be a backwater effect upon the water at Lock No. 21?

Mr. STEWART. Yes.

Mr. VAN KENNEN. Now, the return of that water below the islands would produce from the figures that you made, based on 28,000 cubic feet, how much?

Mr. STEWART. 0.38 feet, or about 4½ inches.

Mr. VAN KENNEN. With regard to that are you practically in agreement with Mr. Lea?

Mr. STEWART. I do not know what Mr. Lea's figures are.

Mr. VAN KENNEN. The next influence that you had upon the elevation at Lock 24 was this embankment between Ogden Island and Canada Island?

Mr. STEWART. Yes.

Mr. VAN KENNEN. And that embankment, you say, would have the effect of raising the water also in the north channel?

Mr. STEWART. Certainly.

Mr. VAN KENNEN. And at the Hogs Back it would raise it how much?

Mr. STEWART. For a discharge of 22,000——

Mr. VAN KENNEN. I am trying to get the normal, the critical point, as you call it.

Mr. STEWART. That would be 22,000. Of course, I am more interested in the low-water conditions from a navigation point of view.

Mr. VAN KENNEN. How many times have they occurred in the last 50 years?

Mr. STEWART. You get conditions from 94,000 to 220,000, and our canals have been constructed for the low-water discharge. Well, I will talk about 220,000.

Mr. VAN KENNEN. Were you practically in agreement with Mr. Lea on that point?

Mr. STEWART. Do you want the Hogs Back?

Mr. VAN KENNEN. The Hogs Back I was speaking about; yes.

Mr. STEWART. We are practically in agreement, as I remember. He said 4 or 5 inches and I said 4 inches.

Mr. VAN KENNEN. How about the effect of that embankment on the elevation of the water at Lock 24?

Mr. STEWART. I stated that there was a net loss of 1 foot.

Mr. VAN KENNEN. How much did that figure out of the backwater effect of the embankment at Lock 24? You have stated the net result, but did you give me the figure for the increase?

Mr. STEWART. Do you mean the additional backwater just from the embankment alone?

Mr. VAN KENNEN. Yes.

Mr. STEWART. 0.44.

Mr. KING. That is at the flow of 221,000 cubic feet per second?

Mr. STEWART. Yes.

Mr. VAN KENNEN. Taking into account the way you have figured it, is that practically in agreement with Mr. Lea?

Mr. STEWART. What is your net figure, Mr. Lea?

Mr. LEA. I did not state it.

Mr. VAN KENNEN. Of course he gave results. You unite the two.

Mr. STEWART. I should unite the two and say a net loss of 1 foot.

Mr. VAN KENNEN. Is that practically in agreement with Mr. Lea?

Mr. STEWART. I do not know what Mr. Lea said.

Mr. VAN KENNEN. Then, of course, we come to the question of the submerged weir. You said that the submerged weir would have the effect of increasing the level at that point?

Mr. STEWART. Yes.

Mr. VAN KENNEN. How much?

Mr. STEWART. It all depends upon the height of the submerged weir.

Mr. VAN KENNEN. But you put it at 15 feet?

Mr. STEWART. No; I said at low water I thought the weir should be put so as to give a draft of 15.7. That would raise the water up to the same point that it was before. That would restore the 1.53 at low water.

Mr. MIGNAULT. You did not recommend putting in a submerged weir having only that stage of water above?

Mr. STEWART. I would not like to. That might be put in by putting in wing dams.

Mr. VAN KENNEN. When you spoke about it being 15 feet plus over that so-called submerged weir, you were speaking of extreme low-water conditions?

Mr. STEWART. Yes.

Mr. VAN KENNEN. What would it be over that at the time when you took the 220,000?

Mr. STEWART. I do not think I gave that figure this morning.

Mr. VAN KENNEN. No, I do not think so; but I was just asking for that additional information.

Mr. STEWART. 18.2.

Mr. VAN KENNEN. Then, at that stage of the water, the stage, I understand, having been referred to by Mr. Lea as being the stage of the water when they run the canal; that is, the critical stage, there would be that 18 feet plus?

Mr. STEWART. Yes.

Mr. MCLEAN. Mr. Perkins, the engineer for the State of New York, wishes to get the 3.30 train, Mr. Chairman. I have spoken to Mr. Van Kennen, and he has no objection to postponing for a moment the further examination of Mr. Stewart in order that Mr. Perkins may testify at this time.

Mr. MAGRATH. That is agreeable.

TESTIMONY ON BEHALF OF THE STATE OF NEW YORK.

ALBRET H. PERKINS, a witness produced for and on behalf of the State of New York, after being first duly sworn, was examined and testified as follows:

Mr. MCLEAN. You are the engineer for the conservation commission of the State of New York?

Mr. PERKINS. I am.

Mr. MCLEAN. And you are the chief of its engineering division of waters?

Mr. PERKINS. Yes, sir.

Mr. McLEAN. Have you recently visited the village of Waddington, in the State of New York?

Mr. PERKINS. I did on the 10th of September.

Mr. McLEAN. And you have examined the locus in quo referred to in this application?

Mr. PERKINS. I have.

Mr. McLEAN. I show you Exhibit New York No. 1, and call your attention to the structure marked "Dam" on that exhibit, and ask you to describe briefly to the commission exactly what you saw when you visited that dam on the 10th of September.

Mr. PERKINS. The dam is a stone and wood structure in a very dilapidated condition. Through the dam water flows with great ease and considerable volume. Below the dam are numerous islands as shown on the map.

Mr. McLEAN. Those are the areas marked A, B, C, D, etc., on the map?

Mr. PERKINS. They are, up to J, inclusive. On these are many ruins of buildings. Near the center of the dam there is a wooden structure in use at present for the development of power for the village of Waddington. On the American side there are numerous dilapidated structures in which the power was formerly developed.

Mr. McLEAN. Mr. Perkins, are there any active powers now in operation on this dam?

Mr. PERKINS. On the dam there is just one.

Mr. McLEAN. Did you take any photographs while you were there?

Mr. PERKINS. I did.

Mr. McLEAN. I show you this photograph and ask you if that is the photograph you took of the dam when you were there on September 10?

Mr. PERKINS. It is.

Mr. McLEAN. It is a correct representation of what you saw at that time?

Mr. PERKINS. It is.

Mr. McLEAN. I offer that photograph in evidence.

(The photograph was marked "New York Exhibit No. 2.")

Mr. McLEAN. Calling your attention to the middle foreground of that photograph "New York No. 2," Mr. Perkins, does that show a frame structure?

Mr. PERKINS. Yes, sir.

Mr. McLEAN. What is that frame structure, if you know?

Mr. PERKINS. That is the plant to which I referred as supplying power to the village of Waddington.

Mr. McLEAN. And that is the only structure that is now in operation on the dam?

Mr. PERKINS. Yes.

Mr. McLEAN. Of what size is that structure?

Mr. PERKINS. I should judge that it might be 20 by 30.

Mr. McLEAN. Is it composed of stone, brick, or wood?

Mr. PERKINS. Wood. It is a frame structure.

Mr. McLEAN. I show you another photograph and ask you if that is a photograph that you took at the time of your visit to Waddington on September 10?

Mr. PERKINS. It is.

Mr. MCLEAN. What was that photograph taken of?

Mr. PERKINS. It is a picture taken around about the center of the dam, looking north.

(The photograph was marked "Exhibit New York No. 3.")

Mr. MCLEAN. Calling your attention to the foreground of Exhibit New York No. 3, will you describe what the ruined structure is, if you can?

Mr. PERKINS. Running straight through the center of the picture is the dam itself. On the right are some of the ruins which I mentioned as being on the islands below the dam.

Mr. MCLEAN. Looking immediately on the downstream side of the dam?

Mr. PERKINS. Yes, sir.

Mr. MCLEAN. And the ruined structure shown in the photograph, then, was one of the structures of these downstream areas?

Mr. PERKINS. Yes, sir.

Mr. MCLEAN. Did you examine the island end of the dam, Mr. Perkins, lettered K, I think, on Exhibit No. 1?

Mr. PERKINS. Yes.

Mr. MCLEAN. What does that consist of?

Mr. PERKINS. A wall replacing the dam where it has washed out previously.

Mr. MCLEAN. What can you say with respect to any channels of the river running up to the dam from the downstream side?

Mr. PERKINS. To the north of the island upon which stand the largest of the ruins there appears to be a channel of considerable depth; how deep, of course, I was unable to tell.

Mr. MCLEAN. Did you see anything with respect to the navigation of the Little River below the dam when you were there on September 10?

Mr. PERKINS. Yes; the steamer ran up to the depot while I was there.

Mr. MCLEAN. How far below the present dam was that depot?

Mr. PERKINS. Probably 300 feet. I should judge somewhere about that.

Mr. MCLEAN. Along the main shore of the Little River, on the downstream side, I believe you said, you observed a power canal?

Mr. PERKINS. Yes; on the south side.

Mr. MCLEAN. That is the main shore side, is it not?

Mr. PERKINS. Yes, sir.

Mr. MCLEAN. Were any mills in operation there?

Mr. PERKINS. I do not think there were any in operation that day, but there were evidences that some of them were operated.

Mr. MCLEAN. They are still capable of being operated?

Mr. PERKINS. Yes, sir.

Mr. VAN KENNEN. Of course, the place where you spoke of the boat coming in is quite a distance below the foot of the island?

Mr. PERKINS. No; I should say not.

Mr. VAN KENNEN. Is it about opposite the foot?

Mr. PERKINS. I think it would be up quite a little ways.

Mr. MCLEAN. Mr. Perkins, you have heard the testimony of Mr. Tucker with respect to the physical examination made of the Little

River for the purpose of determining its so-called natural flow. In your opinion as an engineer are the data given sufficient to justify the determination of what the natural flow is?

Mr. PERKINS. The determination of what was the original section there requires the application of considerable judgment, and I should want to apply my own judgment to that question.

Mr. MCLEAN. Would it, in your opinion, require additional data to be taken on the ground?

Mr. PERKINS. It would.

Mr. MCLEAN. Of what would that data consist?

Mr. PERKINS. The taking of cross sections of the channel and the exploration of the bottom underneath the channel.

Mr. MIGNAULT. How long would it take to make a survey of the Little River?

Mr. PERKINS. I should assume that it might be done, with this sole object in view, perhaps in a week.

Mr. VAN KENNEN. Of course, Mr. Perkins, you say that in order to determine that personal judgment of the engineer taking it would be required?

Mr. PERKINS. Yes.

Mr. VAN KENNEN. And, of course, in order to get that data, one of the necessary things would be to get the depth of the water at particular levels and cross sections of the river?

Mr. PERKINS. Yes.

Mr. VAN KENNEN. And also what deposits might have been put in there?

Mr. PERKINS. That might have accumulated there.

Mr. VAN KENNEN. Of course, in getting that, you would expect, in ascertaining what you would call the natural flow, to take into account any deposits that came in there by reason of the fact that there was a dam below?

Mr. PERKINS. Yes.

Mr. VAN KENNEN. You would include that in your measurements? For instance, if you found an old lock down there, would you call that the natural depth of the stream?

Mr. PERKINS. I should want to exercise my judgment as to whether such a lock, or whatever the impediment might be, would have lodged there with the dam removed or not.

Mr. VAN KENNEN. And to that extent, of course, the personal equation enters into it quite largely?

Mr. PERKINS. Yes, sir.

Mr. VAN KENNEN. You would not expect that any two engineers would get the same data and reach exactly the same conclusions?

Mr. PERKINS. Not exactly. I would expect them to agree substantially.

Mr. VAN KENNEN. You would expect them to agree within 10 per cent, would you not?

Mr. PERKINS. I would not want to set the percentage at this time.

Mr. VAN KENNEN. At any rate, sediment that had accumulated there by reason of the structures that are in there would be taken into account by you in arriving at what we would call the natural bed of the stream?

Mr. PERKINS. If upon examination I concluded that sediment had been deposited there.

Mr. VAN KENNEN. You did not make any examination to find out whether the measurement made and the data produced by Mr. Tucker conformed with your judgment?

Mr. PERKINS. No, sir. I would not be asking for additional time if I had.

Mr. VAN KENNEN. Therefore, you have no knowledge in regard to that?

Mr. PERKINS. No, sir.

Mr. TAWNEY. Mr. Perkins, in your judgment, to what extent would the natural channel of the Little River be obstructed by sediment or otherwise in a period of 110 years, or since the date of the construction of this dam in that river in 1808?

Mr. PERKINS. Considering the very clear character of the St. Lawrence River——

Mr. TAWNEY. Pardon me. Would it wash in from the main river down through the Little River?

Mr. PERKINS. I was about to add to my statement, and also, in consideration of the fact that the channel has been practically closed, not permitting any great amount of water to pass through, and thus not permitting whatever sediment the river does carry to be deposited, I should say it would be very small. Taking those two elements, namely, the closing of the channel at the dam and the clearness of the water at the St. Lawrence River, into consideration, I should say that the amount of sediment in there would be very small. Of course, I will qualify that to this extent, that if the current in that vicinity were of a character to pick up sand just above, and there were sufficient current through there, there might be rapid silting up of that channel, but the conditions are not such as to warrant that.

Mr. TAWNEY. Do you know anything about the bed of the St. Lawrence River above the inlet of the Little River from the St. Lawrence?

Mr. PERKINS. No, sir; I have no complete knowledge.

Mr. TAWNEY. You have no knowledge whatever?

Mr. PERKINS. No, sir; except by hearsay or reading.

Mr. TAWNEY. If there is any sand in the St. Lawrence River, either in the bed of the river or washing along from the shore, would it be most likely to go down into the Little River?

Mr. PERKINS. No, sir; because there is not the current to carry it there.

Mr. TAWNEY. Is it not a fact that sand does accumulate in rivers where there is not a current of more than 2 to 3 miles?

Mr. PERKINS. There are two things necessary for a sediment to get into a place of that sort. If the sediment once gets in there it will be deposited because the current is so slow, but there must be water to carry the sediment in, in the first place. Now, that has been very slight in here.

Mr. TAWNEY. Taking into consideration the fact that this river has been dammed for over 100 years, do you think that it is altogether likely that the bed of the river has been filled up considerably with sediment that has washed in from above during that period of time?

Mr. PERKINS. I would not think so under these conditions. With the very small amount of water that passes through there at times there is practically nothing, as I understand it.

Mr. VAN KENNEN. In referring to your exhibit there you said that it bore indications of the ruins of all those mills from one end of the shore to the other. Do you mean that when those mills were in operation up to within the last few years there was no current down that stream?

Mr. PERKINS. If there were, the sediment would go right through with the current.

Mr. VAN KENNEN. But when does the sediment go through with the current and when does it stop?

Mr. PERKINS. There would be some intermediate point when all of the water was being used here that there would probably be a free current through there.

Mr. VAN KENNEN. You are predicating your statement in regard to the deposits there practically upon the conditions that you found to-day. A slow-moving current serves only a few miles below?

Mr. PERKINS. That is true.

Mr. VAN KENNEN. So that from that down to the time when they were using practically the entire flow of that river for power purposes you would have the acceleration of current, would you not?

Mr. PERKINS. Yes.

Mr. VAN KENNEN. And that might have a very great effect upon the deposit there?

Mr. PERKINS. Yes.

Mr. VAN KENNEN. Are you at all familiar with the inland streams that go into the River St. Lawrence?

Mr. PERKINS. Yes.

Mr. VAN KENNEN. Do you know whether there is any sediment coming from those rivers?

Mr. PERKINS. Yes.

Mr. VAN KENNEN. Do you know what the sediment is coming from the Oswegatchie, which is about 11 miles above?

Mr. PERKINS. I assume it is considerable.

Mr. VAN KENNEN. Have you ever had an opportunity to examine it?

Mr. PERKINS. Yes; I have been there many times.

Mr. VAN KENNEN. Do you not know, as a matter of fact, that that is the most filled with sediment coming down that stream that you find anywhere on any stream?

Mr. PERKINS. No.

Mr. VAN KENNEN. Do you know it is so discolored that you can determine by actual observation where the water from that stream strikes the water of the St. Lawrence at times?

Mr. PERKINS. I presume that is very true.

Mr. VAN KENNEN. That is due to sediment, is it not; the discoloration of the water?

Mr. PERKINS. Yes.

Mr. VAN KENNEN. Do you not know that all up and down there the shores are of clay and sand?

Mr. PERKINS. Yes, sir.

Mr. VAN KENNEN. Well, do you not know that the wash of that would come into that river?

Mr. PERKINS. A certain amount of it.

Mr. VAN KENNEN. Then, I take it, that that would all create sediment, would it not?

Mr. PERKINS. Well, but the volume of the St. Lawrence River is so tremendous.

Mr. MCLEAN. How far above the mouth of the Little River is the Oswegatchie?

Mr. PERKINS. About 12 miles.

Mr. MCLEAN. I can not give you the volume of the Oswegatchie offhand, but I think in flood flow it would probably reach 12,000 or 15,000 cubic feet per second. That is largely a guess. At that time, approximately, what would be the flow of the St. Lawrence River?

Mr. PERKINS. Well, that could occur at most any time. The average flow has been given here, I believe, as 225,500.

Mr. VAN KENNEN. We practically agree with you that the Little River as compared to the big river is about 10 per cent.

Mr. PERKINS. No, sir; not under present conditions.

Mr. VAN KENNEN. But I speak about the natural flow of that stream. I do not wish to confine you accurately to it, but practically to it.

Mr. PERKINS. I should think it was quite a considerable quantity less than that. Your minimum amount is 15,000. The minimum flow of the St. Lawrence River is 185,000.

Mr. POWELL. To what process of investigation would you resort in order to determine the alluvial deposit in that stream?

Mr. PERKINS. I think that the figuring of the natural flow of the Little River is a question which must be determined within considerably wide limits.

Mr. POWELL. It is considerably a matter of speculation?

Mr. PERKINS. Yes.

Mr. POWELL. Can you arrive at it approximately by going to other portions of the main river and seeing what the alluvial deposit at the bed of the river is there?

Mr. PERKINS. I would think that would be a method of very doubtful value, because each variation of condition will affect that very much. For instance, what causes the deposit of sediment is the slowing up of the water. If the water can continue on at the same velocity the sediment will continue on with it. In each particular location you will get different degrees of the slowing up of the water.

Mr. KOONCE. I wish to introduce another witness on the testimony given by the last witness.

JOHN E. CHURCHILL, United States district engineer, sworn.

Mr. KOONCE. What is your position, Mr. Churchill?

Mr. CHURCHILL. United States district engineer.

Mr. KOONCE. Where are you located?

Mr. CHURCHILL. At Oswego.

Mr. KOONCE. How long have you been in charge of that district?

Mr. CHURCHILL. About 20 years.

Mr. KOONCE. Have you had occasion to examine that part of the St. Lawrence River opposite Waddington?

Mr. CHURCHILL. Yes.

Mr. KOONCE. Do you know anything about the characteristics of the Little River, so called?

Mr. CHURCHILL. Somewhat.

Mr. KOONCE. Would you give the commission a description in your own way of the entrance and general characteristics of the stream, so far as you have observed them?

Mr. CHURCHILL. The entrance is between the head of Ogden Island and the American shore. The width they have given is, I think, 600 feet, and the bottom, as I recollect it, was some small bowlders and silt. I do not remember as to the depth of the bottom the last time I was there. Below the entrance the intake is rather short. After that it extends into a broader and deeper area down to the bridge. From there on it is considerably wider than at the entrance.

Mr. KOONCE. Do you know whether there have ever been any surveys by the United States Government of that section of the river?

Mr. CHURCHILL. Yes, sir. The surveys were made for the purpose of improving the conditions at the head of the Little River, and also surveys were made for the purpose of improving the river below.

Mr. KOONCE. There has been a survey made at least of the entrance of the Little River?

Mr. CHURCHILL. Yes, sir.

Mr. KOONCE. And you have data on that subject?

Mr. CHURCHILL. Yes; but that was made a great many years ago. I did not make it myself.

Mr. KOONCE. I call it to the attention of the commission so that if they desire that data it can be furnished to them. Of course, you don't recall the facts that you found as to the depth?

Mr. CHURCHILL. I do not remember.

Mr. KOONCE. You know that it was a regular instrumental survey, and that you made soundings, such as Mr. Tucker described?

Mr. CHURCHILL. I do not understand that there were any borings.

Mr. KOONCE. You took the soundings down to the rocks?

Mr. CHURCHILL. I did not take them; that was before I was there. These are records which are in my office.

Mr. KOONCE. I understand it was before your time, but that would be the natural process.

Mr. CHURCHILL. Yes; that would be the only way of doing it; they went down to the natural bottom of the channel.

Mr. KOONCE. About what time was this survey made?

Mr. CHURCHILL. I think it was made in 1872 or 1873.

Mr. KOONCE. Over 40 years ago.

Mr. CHURCHILL. Yes.

Mr. KOONCE. It might be interesting to compare your data with the data furnished by Mr. Tucker.

Mr. CHURCHILL. It might be of some value.

Mr. KOONCE. If there were any deposits since that time you could get at it.

Mr. CHURCHILL. My recollection is that there was another one made about 1880.

Mr. MIGNAULT. Do you think this survey went down to the river bottom or merely measured the depth of the water?

Mr. CHURCHILL. I think they merely measured the depth of the water at the time the soundings were made. I do not think any effort was made to obtain borings.

Mr. POWELL. The surveys would show the height of the surface of the water above bottom?

Mr. CHURCHILL. Yes.

Mr. POWELL. In that way you could get at whether the bed of the stream has risen or not since that time?

Mr. MIGNAULT. I do not know how he could.

Mr. POWELL. Do not understand me to speak about going down to hardpan.

Mr. MIGNAULT. You mean as the surface was at that time?

Mr. POWELL. Yes.

Mr. MIGNAULT. It is not of much importance, because unless the surveys were here Mr. Churchill could not recollect sufficiently of what it amounts to.

Mr. POWELL. I think it is a very important matter; speaking for myself, I would like to see the surveys.

Mr. MIGNAULT. So would I.

Mr. POWELL. That survey would show the depth of the water at that time, and if the water is shallower to-day it would show what was the increment of alluvial deposit in the bed of that stream.

Mr. CHURCHILL. There has been dredging since that time.

Mr. POWELL. Then that upsets the whole thing.

Mr. CHURCHILL. There was a survey made afterwards.

Mr. KOONCE. You dredged about the head of the Little River?

Mr. CHURCHILL. Yes.

Mr. KOONCE. That naturally disturbed the sediment.

Mr. CHURCHILL. It was done for the purpose of getting the sediment and stone.

Mr. KOONCE. It created some sort of sediment in the water.

Mr. CHURCHILL. Yes.

Mr. KOONCE. As I recall it, when this application of the New York & Ontario Power Co. first came in in 1916, your office at Buffalo reported—the application at that time was for the diversion of the natural flow of the river—the Buffalo office, as I recollect it, reported that the natural flow of the river was 26,000 c. f. s. I assumed that that was based on this survey, reports, and information that had been gotten before.

Mr. CHURCHILL. It is based on reports that were in the office; no special survey was made at that time.

Mr. KOONCE. I understand that you made no special examination then, but you had made two surveys before that.

Mr. CHURCHILL. Yes; it was based on the general data in the office as nearly as could be made.

Mr. TAWNEY. You reported to the War Department about the natural flow of the Little River.

Mr. CHURCHILL. That was not my report; it was made from the office in Buffalo.

Mr. TAWNEY. It was made through the office of the engineer at Buffalo.

Mr. CHURCHILL. Yes.

Mr. TAWNEY. And 26,000 c. f. s. was given as the natural flow.

Mr. CHURCHILL. Yes.

Mr. TAWNEY. You are acquainted with this part of the St. Lawrence River?

Mr. CHURCHILL. Yes.

Mr. TAWNEY. You have been in charge there how long?

Mr. CHURCHILL. I have been there for 20 years.

Mr. TAWNEY. Is the river above the inlet at Little River; that is, the St. Lawrence River above the inlet of Little River, one and the same river?

Mr. CHURCHILL. Yes, sir.

Mr. TAWNEY. About how wide is it?

Mr. CHURCHILL. Perhaps a couple of thousand feet; I do not remember just what the width is. I have Mr. Tucker's estimate of that.

Mr. TAWNEY. What is the effect of the wind on the bank of the river?

Mr. CHURCHILL. I think wind will make quite a wave on the river, which washes the banks; the banks are clay.

Mr. TAWNEY. Where does that silt go?

Mr. CHURCHILL. That follows down, usually, close to the shore.

Mr. TAWNEY. Is there any evidence of that in the color of the water along the shore?

Mr. CHURCHILL. Yes.

Mr. TAWNEY. Then, anything along the Little River would naturally come down along the shore and go down the Little River?

Mr. CHURCHILL. It would be very apt to come into the entrance of the Little River. Of course, there is not much current there. It would form an eddy, I should think, and deposit there.

Mr. MAGRATH. Is it not as likely that you would have that wave action within the Little River, washing the banks there?

Mr. CHURCHILL. Of course, the Little River is very narrow and the wave action there would be slight and would quickly disappear.

Mr. KEEFER. You spoke of the average flow as being what?

Mr. CHURCHILL. 26,000 c. f. s.

Mr. KEEFER. Do you know at what stage of the river that was?

Mr. CHURCHILL. I do not recollect; I have not the data here.

(The witness was not further examined.)

WILLIAM J. STEWART, Dominion hydrographer, cross-examination resumed.

Mr. VAN KENNEN. Is there something you want to state, Mr. Stewart?

Mr. STEWART. I want to state now that I have been making some error with regard to the height of this submerged weir. I gave my statement as 15.7. What I find on looking through my notes is that I figured for the weir at an elevation of 20.75 instead of having a draft over it of 15.7, so that nearly all my evidence on this subject of the submerged weir will have to be changed.

Mr. VAN KENNEN. To our advantage?

Mr. STEWART. I am afraid not.

Mr. MIGNAULT. In view of what you have said just now, you had better give a full statement.

Mr. STEWART. With the weir at an elevation of 205.7 and taking the low-water flow of 194,000 c. f. s., with a flow of 194,000 c. f. s. the water on the lock sill of Lock 24 under natural conditions would be 14 feet. That would be an elevation of 222.12, and a clearance over the submerged weir of 15.9 feet.

Mr. VAN KENNEN. Give the same figures when the discharge in the river is 222,000 c. f. s.

Mr. STEWART. I am afraid I have not that exactly. I have it for 211,000 c. f. s., but not for 222,000 c. f. s.

Mr. VAN KENNEN. Well, take it for 211,000 c. f. s.

Mr. STEWART. For 211,000 c. f. s. the draft over the submerged weir would be 17.6, and that will put the water at Lock 24, 223.8.

Mr. VAN KENNEN. And the depth on the sill of the lock?

Mr. STEWART. 15.68.

Mr. VAN KENNEN. Now, of course, in giving your other statement you, I believe, stated that at the low stage it would be 15.1 over the weir instead of 15.68.

Mr. STEWART. My later figures are correct.

Mr. VAN KENNEN. 15.9 over the weir at very low stage would be all right so far as navigation is concerned; that would not interfere with navigation specially.

Mr. STEWART. Well it would be better than over the lock sill.

Mr. VAN KENNEN. It would be better navigating there than it would be over the lock sill.

Mr. STEWART. With that elevation over the weir, so far as navigation is concerned, it would not be hurt.

Mr. VAN KENNEN. Can you tell us what the depth over the lock sill of Lock 15 would be at that same stage of 211,000 c. f. s.

Mr. STEWART. I could not do that; I do not know the elevation of the sill at Lock 15. There is some hog's back in that, too, and I do not know what it is. It would be 13.6 according to Mr. Lea's blue print.

Mr. VAN KENNEN. Is there anything else, Mr. Lea, that you would like me to ask Mr. Stewart? You are referring in these figures to a discharge of 190,000 c. f. s. per second.

Mr. STEWART. Yes.

Mr. VAN KENNEN. Is that what you figure the extreme low?

Mr. STEWART. Well, the extreme monthly mean is 194,000 c. f. s., which means that for a good many hours in the day it would be less than 194,000 c. f. s., and so I took 190,000 c. f. s.

Mr. VAN KENNEN. That is arbitrary.

Mr. STEWART. It is within the bounds of reason.

Mr. VAN KENNEN. Of course in taking into account these figures and the elevation of the water on the lock sill, as you have explained before, you took what you considered the present conditions of the discharge through the Little River.

Mr. STEWART. The conditions that pertain to the present discharge; yes.

Mr. VAN KENNEN. Are you familiar with that at all, or have you been in your past experience?

Mr. STEWART. Familiar with what—the Little River?

Mr. VAN KENNEN. Yes.

Mr. STEWART. I have been on the Little River at various times. I do not know what the discharge through it was. But all the measures that have been taken on the St. Lawrence River, and from which all the discharge measurements of Lake Ontario are taken, are measured at Point Three Point, which is about half way between the intake of the Little River and Iroquois, so that this measurement and

everything in the river takes into account that that is the discharge of the river.

Mr. VAN KENNEN. I understand that, but what I was trying to get from you, Mr. Stewart, is what personal knowledge you have of the discharge through the Little River, if any.

Mr. STEWART. I have never measured it.

Mr. VAN KENNEN. Are you familiar enough with it to know that in years gone by there was a full line of mills operating at Waddington at this dam.

Mr. STEWART. I can not say; at that time I was pretty young.

Mr. VAN KENNEN. No, sir; you were not.

Mr. STEWART. I know from what I saw the other day that there were mills there, but I never saw them working.

Mr. VAN KENNEN. Now, Mr. Stewart, when these mills were in operation there in years past of course the discharge of the Little River must have been a great deal more than 3,000 c. f. s.

Mr. STEWART. It might be. I do not know how much water the mills used.

Mr. VAN KENNEN. Of course you don't. Now, if they were using, say, 26,000 c. f. s. it would make a great deal of difference.

Mr. STEWART. Oh, yes.

Mr. VAN KENNEN. So that if they were taking out the natural flow of the stream, as is testified to, we had 26,000 c. f. s. Then, of course, the effect on Lock 24 would be to lower the water at that place over what it would be over 3,000 c. f. s.

Mr. STEWART. Certainly.

Mr. VAN KENNEN. So that your line of argument practically is this——

Mr. STEWART. I am not setting up any argument.

Mr. VAN KENNEN. Your line of reasoning, as put in your figures, is to take the condition of the Little River with the discharge as at its very lowest, and you are asking to have that maintained, because if we take the natural flow then it will affect the water on your lock sills. Is that right?

Mr. STEWART. Yes.

Mr. VAN KENNEN. Of course, when that canal was first built there in 1848 or 1850 there were a great many more mills in operation at Waddington than at the present time; that is your knowledge, is it?

Mr. STEWART. It is not my knowledge; I can not say as to 1848.

Mr. TAWNEY. At that time they were diverting the natural flow of the stream through the Little River upon a basis of 26,000 c. f. s.

Mr. STEWART. At what stage of the river?

Mr. TAWNEY. Let us call it the medium stage, or at 225,000 c. f. s., approximately; and then, of course, the level of your water at the lock sill would be much lower than it would be with the amount that is now being diverted that you took and used in your computations. Is it not?

Mr. STEWART. If they were using 26,000 c. f. s., it was lower.

Mr. TAWNEY. Or whatever more they were using above 3,000 would proportionately reduce the water at the lock sill.

Mr. STEWART. Certainly.

Mr. VAN KENNEN. From your computations you are making up your figures on the basis that, inasmuch as there has been a decreased flow as time went on, from the time when you constructed your canal, that we ought not now to take the natural flow; is that the basis, practically, on which you have built your figures?

Mr. STEWART. I built my figures on conditions that had obtained previous to 1904, when these curves came into use.

Mr. VAN KENNEN. What curves?

Mr. STEWART. There has been practically no lowering of the water on the sill since. The lowest water since 1904 on the sill of Lock 24 is 14 feet.

Mr. VAN KENNEN. That is right, Mr. Stewart; but what I am getting at is not quite that; your figures are predicated upon a diversion rate in the Little River of 3,000 c. f. s.

Mr. STEWART. Yes, all my computations are on that.

Mr. VAN KENNEN. They are based on that?

Mr. STEWART. Yes.

Mr. VAN KENNEN. That is all I want on that point. Of course you, yourself, have no data that you acquired in getting these figures; you took them as arbitrary?

Mr. STEWART. I took them as supplied me by your own engineers.

Mr. VAN KENNEN. As the possible diversion at the present time?

Mr. STEWART. As the possible diversion since 1904, anyway.

Mr. VAN KENNEN. If I understand correctly, you also made some computations, or had before you some computations, with regard to the natural flow during your investigation here?

Mr. STEWART. Yes.

Mr. VAN KENNEN. Now, you at first took the United States survey and ascertained that these figures that were put upon that chart were not considered by you reliable?

Mr. STEWART. They are reliable, but they did not give me the information.

Mr. VAN KENNEN. Then you made inquiry of the War Department to ascertain whether they had any figures?

Mr. STEWART. Yes; I asked the Lake Survey people.

Mr. VAN KENNEN. And you were advised there were none?

Mr. STEWART. Yes.

Mr. VAN KENNEN. Then, after doing that, you took the figures that were furnished you from the actual survey made by Mr. Tucker, the engineer.

Mr. STEWART. I took what he supplied me.

Mr. VAN KENNEN. And these you took and you, yourself, checked up the natural flow of that stream?

Mr. STEWART. From this data.

Mr. VAN KENNEN. From that data, and assuming, of course, that it was correct, it was sufficient to give you the natural flow. That is, the figures that were produced would give you sufficient data on which to compute the natural flow.

Mr. STEWART. I think so.

Mr. VAN KENNEN. And of course you found the natural flow to be substantially or exactly as was found by Mr. Lea and computed by him?

Mr. STEWART. That is what I found.

Mr. VAN KENNEN. I think you stated in your direct examination upon that point that, in view of the evidence that was given by Mr. Tucker as to the manner in which these measurements were taken, you thought that an investigation, independent of that, should be taken into account in order to determine the natural flow.

Mr. STEWART. To determine the flow with the river in its present condition.

Mr. VAN KENNEN. We were speaking about the natural flow of that stream.

Mr. STEWART. I thought I was getting all the information about the Little River that there was to be had. I was not advised that these cross sections that were given me were cross sections of the river below the bottom of it. I did not know that there were any deposits in the river; I was never advised of that.

Mr. VAN KENNEN. Assuming as an engineer that you are charged with the task of trying to get the natural flow of that stream, as an engineer would you have any conditions, so far as you know them at that point, to consider after you took the soundings as Mr. Tucker described them?

Mr. STEWART. I think so. I would take the bottom of the river as what I found it.

Mr. VAN KENNEN. No matter if you found there a silt deposit which bore every evidence of having been deposited there by reason of the fact that that stream was dammed; you would not take that into account at all?

Mr. STEWART. I can not tell. I do not think anyone could tell what the depth of the silt was.

Mr. VAN KENNEN. Would you take it into account at all?

Mr. STEWART. If I knew how much silt there was there and knew it was silt, I would.

Mr. VAN KENNEN. And if that mill pond was used for logs and you found at the bottom of the river sunken logs, would you take into account things of that kind?

Mr. STEWART. I would try to get past the logs.

Mr. VAN KENNEN. You agree that there has got to be some element of personal judgment in regard to that matter.

Mr. STEWART. There would have to be.

Mr. VAN KENNEN. And you would take these things that you felt and were reasonably sure went into that stream by reason of the dam being there, and eliminate these from your calculation, would you not?

Mr. STEWART. I would. But I would rather take my own judgment on that than take the judgment of some one else. I would like to be there and examine it for myself.

Mr. SPRATT. And I presume you would allow Mr. Tucker also to draw the conclusion that in his judgment he might think better.

Mr. STEWART. Why, certainly.

Mr. VAN KENNEN. Would you expect some variation of judgment on that matter?

Mr. STEWART. I think so.

Mr. VAN KENNEN. You probably would not reach exactly the same conclusion that every one of the engineers that have been here have sworn to as their conclusion?

Mr. STEWART. Perhaps not.

Mr. MIGNAULT. Is the object of this examination to show the uncertainty of expert testimony?

Mr. KEEFER. It is to show that engineers, like lawyers, differ.

Mr. VAN KENNEN. There might be an element of variance there which I take it would be small.

Mr. MCLEAN. In computing these cross sections, as I understand, soundings were used and sounding were taken at different points on the Little River. In your opinion would those soundings show that the surface of the water was at the same level, when taken in 1917, as the level of the water at that point would be before the present dam and obstructions were in the Little River?

Mr. STEWART. Mr. Tucker in supplying these cross sections gave me the area of the river at a certain elevation.

Mr. MCLEAN. And he testified that he determined these elevations of the river by soundings?

Mr. STEWART. No; he would not determine the elevation of the river by soundings; he would get the depth.

Mr. MCLEAN. He took the soundings and compared the readings with the gauges at Lock 24.

Mr. STEWART. The gauges and the levels on the land supplied the elevation.

Mr. MCLEAN. Would there be any difference in these levels as taken in 1917 to the surface of the water as it then existed as compared with the surface of the water before the dam was in the Little River?

Mr. STEWART. Very probably. Where the dam was in there was a cross section by what he called section 7, the smallest one, he would have a smaller area for that water surface, but he could correct it up to the surface of the water as it was in 1917.

Mr. MCLEAN. To find the true cross section as it existed prior to the time this dam was put in, would it be necessary to interject the element of allowing for the difference in level between the water influenced by the dam?

Mr. STEWART. If he wanted to know it; yes.

Mr. VAN KENNEN. That would not make any difference in the cross section.

Mr. STEWART. The cross section for the level before the dam was in; yes. But if he came up to the same level of water it would not make any difference.

Mr. KING. As to this submerged weir, my recollection of the figure given this morning was 15.7.

Mr. STEWART. I withdrew that.

Mr. KING. The figure given this afternoon for the low stage of the river, as representing the depth of water above the crest of the submerged weir, is 15.9 feet.

Mr. STEWART. Yes.

Mr. KING. I suppose at that stage of the river, as you also stated, it would give 14 feet over the sill of Lock 24, and the Rapide Plat is not navigable bound down.

Mr. STEWART. No.

Mr. KING. So that we are not immediately concerned with that measurement, so far as the boats are concerned.

Mr. STEWART. When you say not navigable for bound down, it is not navigable for boats drawing 14 feet. If you lighter them to 12 feet it would be.

Mr. KING. If you take barges which have been mentioned by some of the witnesses as drawing 9, 10, or 11 feet.

Mr. STEWART. They could go down.

Mr. KING. But they would have to pass over the crest of this weir.

Mr. STEWART. Yes; which would be another Hogs Back with a bigger pitch than the other one.

Mr. KING. You told us this morning that the depreciation in level at Lock 24, due to the withdrawal down the Little River, and with the amount put back by the two compensations, was still 1.53 feet.

Mr. STEWART. Yes.

Mr. KING. Which had to be made up.

Mr. STEWART. Yes.

Mr. KING. And that 1.53 would represent the height of the embankment over this weir.

Mr. STEWART. Yes.

Mr. KING. Whether there was 15.9 or 17.6, there must be still a pitch of the amount which you require to compensate over the sill of Lock 24?

Mr. STEWART. Yes.

Mr. KING. Then we would still have a cellar below the pitch.

Mr. STEWART. I take the cellar to be where the water comes down the pitch and rises again. There might be that. The river is wider there and the water is deeper. I can not tell you.

Mr. KING. Your testimony remains unchanged on the one point, namely, the pitch would bar upbound navigation.

Mr. STEWART. I think so; I do not think it would get over that 1½ feet.

Mr. KING. What would the width of the crest of your submerged weir be?

Mr. STEWART. That would depend a great deal, I understand from the engineers, on the amount of material they could deposit.

Mr. KING. Mr. Lea suggested a broad one of at least 500 feet.

Mr. STEWART. That would cut the pitch out a whole lot.

Mr. KING. In what way?

Mr. STEWART. It would have a longer time to get over.

Mr. KING. It would make a longer slant?

Mr. STEWART. I think it would make a little longer slant.

Mr. LEA. It would not be the kind of a thing you are calling a pitch; it would be more of a slope in the water.

Mr. KING. May I describe it as a shoot the chutes?

Mr. LEA. No; it would be a piece of stream the same as many others all the way downstream.

(End of examination of Mr. Stewart.)

R. S. LEA, consulting engineer, New York & Ontario Power Co., recalled.

Mr. VAN KENNEN. I wish to call Mr. Lea to explain some of the computations made.

Mr. LEA. With regard to the backwater calculations and the elevations produced by the abstraction of the water for power down the

Little River, the results obtained by Mr. Stewart and myself, in most cases, substantially agree. That is, he agrees that down to low water, not extremest low water, but down to low water, we compensate fully for depth on the Hogs Back. The results at Lock 24 are not quite the same for the reason that Mr. Stewart figured on a diversion of 28,000 c. f. s. and I figured on a diversion of 27,000 c. f. s., which makes the drop that he called 2 feet—1.85, according to his own curves—I called it 1.6 yesterday. That is, a diversion that would get 30,000 c. f. s. down the Little River, or 27,000 c. f. s. would produce a drop of 1.6. I explained it would be the same on Lock 24 as on Lock 23 and at eight or ten points of the rapids, so that the difference between us on that point, considering the diversion as 27,000 c. f. s., is the difference between 1.85 and 1.6, or 0.25 feet. That is due to the difference between the results given and obtained by the United States Lake Survey and those obtained by Mr. Stewart himself and his staff, which are based upon the results of the United States Lake Survey in great part. I might also add that that difference of 0.25 is not shown by the results which we personally obtained by our gauge readings in the vicinity. So, for my part, I adhere to my idea that the true diversion drop due to 27,000 c. f. s. being taken out is 1.6 and not 1.85. So that all of the depths which Mr. Stewart has given, and the elevations, and so on, require to be corrected, and in my opinion be reduced by 0.25.

Mr. VAN KENNEN. How much is that in inches?

Mr. LEA. Three inches. So that our submerged weir, as it is called, would not have to make up 1.53 but 1.28 feet at the very lowest water—that is, 190,000 c. f. s.—and which occurs very rarely indeed. Therefore, in brief, the difference between Mr. Stewart's results and my own do not amount to anything.

Mr. TAWNEY. Suppose when the water was at that extreme low stage the power company was prohibited from drawing the full 27,000 c. f. s. and the amount was limited, say, to 15,000 c. f. s., what effect would that have on the depth of the water on the sill of Lock 24?

Mr. LEA. We could restore the depth to any extent we pleased, and, of course, that would be done because our plant is supposed to be operated directly, especially in such extreme low stages as that, under the surveillance of this body—the International Joint Commission. There would be no difficulty whatever about that. Besides that, I am very doubtful, indeed, whether we would go to the expense of excavating our headrace and tailrace to the extent necessary to withdraw 28,000 c. f. s. in these extremely rare times. We would have what we require for 98.9 per cent of the time without doing it.

Mr. POWELL. And practically these changed conditions would be responsive to the governing of it.

Mr. LEA. Yes; we could raise the level at Lock 24 immediately by closing down one or more of the power units.

Mr. KEEFER. Your estimate was largely based on the theory of 16 feet on the sill.

Mr. LEA. Oh, no.

Mr. KEEFER. You have taken that as your basis, have you not?

Mr. LEA. Oh, no; all I expect to get on the sill is enough for navigation.

Mr. KEEFER. What would that be?

Mr. LEA. I should think it would be 14½ feet or perhaps less. What I mean by navigation is this: The navigation is governed, even after we have put in our works, by the depth on Lock 15, and so long as we can keep more water on it than on Lock 15 we are complying with the conditions of navigation.

Mr. KEEFER. The whole canal system is worked out on the basis of 14 feet on the sill.

Mr. LEA. The whole system does not really comply with it.

Mr. KEEFER. It may not, but that is the basis on which it was made.

Mr. LEA. But Lock 15 is very much shallower than Lock 24.

Mr. STEWART. Lock 15 met with an accident.

Mr. KEEFER. The system of navigation is 14 feet.

Mr. LEA. The depths on the lock sills all vary. I do not know what the system was; no matter what the system was that was the result.

Mr. KEEFER. Don't they start on the same system?

Mr. LEA. They call it 14-foot navigation and that is what we are absolutely compelled by the regulations and conditions which will be imposed and which we will comply with, and which we can very easily comply with; that is, to provide the required depth on the lock sills at low water as well as at any other time.

Mr. VAN KENNEN. Do you mean by that so far as the practical engineering part of this project is concerned, that you could maintain at all times, if this plan which you now suggest is carried out, 14 feet on the lock sill?

Mr. LEA. Yes; more than 14 feet.

Mr. VAN KENNEN. How much more?

Mr. LEA. Enough to let them get over it easily.

Mr. VAN KENNEN. And the feasibility of your plan would not be affected thereby.

Mr. LEA. No; because we are not considering anything less than 210,000 c. f. s. If the river goes below that they can have our plant operated any way they please. But it goes below that very seldom and we should have to shut down in such a slight degree that we would be in better condition than 99 per cent of the power plants in the country. Not only that, but we can do what I say without having the submerged weir, so-called, as high as it is shown on Exhibit 29.

Mr. VAN KENNEN. And if that were objectionable from the standpoint of navigation, you could easily alter your plans so as to produce the same result.

Mr. LEA. Yes; with very much less height.

Mr. VAN KENNEN. And as the consulting engineer you state now that you would be willing to have this commission impose such terms and conditions upon your project.

Mr. LEA. Absolutely. As to Mr. Stewart's evidence in regard to backwater and levels, we are willing to take it the same as our own and to meet the requirements suggested by that evidence of Mr. Stewart.

Now, the other point was this: A good many questions were asked Mr. Stewart about the proposed or possible development of the whole river at Morrisburg, and as to whether the part of the power being

developed by us at the site at Waddington would or would not admit of as efficient development of the total river as if it were all developed below the foot of Ogden Island. As I understood it, Mr. Stewart's opinion was that 30,000 c. f. s. of the total flow of the river would be a little less efficiency developed than would be the case if it were all developed below Ogden Island.

Mr. TAWNEY. As I recollect it, his conclusion was that if the potential power development in the main river or north channel was developed to its full efficiency, and with this development in, that the efficiency would be less here than if it were developed in connection with the development of the whole river.

Mr. LEA. Yes; that is the same idea.

Mr. POWELL. A constant quantity would be in the main channel the same in every case, but a variable element would be in the south channel.

Mr. LEA. And that it would be less efficient where we propose to place our development than if placed further down. That was the idea. Mr. Stewart also stated in his evidence that he had not made any special study of the proposed power development at this point in his study of the regulation of the river, not even of the regulating dam at the outlet of Lake Ontario; that he has studied at great length the results of regulating Lake Ontario at certain levels on the flow of the river, but as to how they were to be carried out he had not made a study of it. I think that he said that.

Mr. STEWART. I referred to the nature of the works.

Mr. LEA. Exactly.

Mr. STEWART. What I referred to was the actual construction.

Mr. LEA. And the location.

Mr. STEWART. I took the location as being down at Canada Island.

Mr. LEA. But you have not made any special study of the location. Well, I stated yesterday, I was asked particularly to state on oath whether I believed that power can be developed most efficiently with part of it developed on the site proposed by us, and I said yes, in accordance with the knowledge that is so far available. And with regard to the knowledge that is so far available, I have this to say: That we have studied the whole matter just as much as we have the Waddington power scheme for the last two years, and we have taken a great many measurements, for instance, the location of these gauges up and down the rapids, and other points, in connection with that very purpose.

And during the present summer the project has been taken up also in connection with the hydroelectric commission. I do not mean that it was taken up by this company in connection with the hydroelectric commission, but this idea of developing the whole river and getting the necessary data to determine what should be done, and the costs, and so on, have been taken up by the hydroelectric commission, and the work which we have done, which is valuable, has been adapted and given to them. They have two parties obtaining data there at the present time and a number of gauges have been set. I mention that here because we have done the work already and the location of the gauges and the work of the field parties has been under my direction, so that I think the result of my studies in connection with Morrisburg has been added to by the results we have obtained this

year by the work of the two parties of the Ontario hydroelectric commission. This accumulation of data is going on at the present time, and so a complete study is not possible now, but will be when these field parties have concluded their work and we have time to complete the study. But in the meantime we have had, in connection with our Waddington work, a great deal of information about the location below Ogden Island and above it, which is not available, so far as I know, to anybody else. It was on the basis of all this information and study that I made that statement. And I may add that an off-hand opinion, or an opinion given by simply looking at the map of the river, may lead one to consider that the proper place would be in a straight line across the river, some place below Ogden Island, but a further study of the head available there and the bottom required to get foundations in to produce the power available, would show that there is not really room there. We have consulted with makers of high-class turbines—Morris, of Philadelphia—as to the wheels which will occupy the least space possible so as to shorten up the power house as much as possible, and the figures we have are 50 horsepower to a foot, which means, for 300,000 horsepower, 6,000 feet for the powerhouse alone. Well, the width of the river at that point below Ogden Island will not accommodate the wheels, without any room whatever for regulating works or overflow works, if placed in that direction. We have to go up and down the river in a longitudinal direction and cross at each end.

Mr. MIGNAULT. You could go diagonally across?

Mr. LEA. Yes. Studies, of course, will be made to determine that. We naturally have not been able to locate these works exactly, because we do not know exactly what the head obtainable is yet nor do we know what the material is in every part of the river. We know, for one thing, however, that at where our proposed works are, it corresponds, if you look at the map, to the position of that hard rock ledge which we call the Hogs Back, which forms the Rapide Plat, so we have good foundations there at any rate. We also know that following this line down, and in a general direction either diagonally or otherwise, we are likely to get plenty of depth of water for our tailrace by that development, and room enough for the regulating, such as Mr. Stewart finds is necessary.

Here is another thing—210,000 c. f. s., which would give at 15 feet head about 310,000 or 315,000 horsepower, is the minimum flow and only occurs in a few years, and naturally would not be the fullest development. So that you can see that a statement which may be made even after considerable study of this location is liable to be entirely astray and quite naturally so.

Mr. KEEFER. Did I understand you to say that this study which was going on you were making for the hydroelectric commission?

Mr. LEA. One moment, I was speaking of the unreliability of an opinion given off hand. This difficulty of giving a guess off hand is more particularly applicable to the St. Lawrence River, because you can not widen it by damming it. If you were to put a dam there 15 or 18 feet high you would not widen it by more than 100 or 150 feet. It is not like any river that anyone else knows of on this continent, on account of its uniformity of flow.

Mr. KEEFER. You say that the hydroelectric commission is doing this work now?

Mr. LEA. Yes; they have parties there.

Mr. KEEFER. Are you connected with that work for them?

Mr. LEA. I am directing that work in consultation with them as consulting engineer.

Mr. KEEFER. Are you in their employ, or are you working for some other body?

Mr. LEA. No; I am working for the hydroelectric commission in connection with that.

Mr. KEEFER. On the big general scheme?

Mr. LEA. In connection with gathering information for the general scheme.

Mr. POWELL. So that you are really director of field work?

Mr. LEA. Yes; and the work that has been done so far has been done exactly the way I asked to have it done, in consultation, of course, with the hydroelectric engineers. I am the consulting engineer to the hydroelectric engineers.

Mr. POWELL. You do not pretend to speak for the hydroelectric commission as to whether this work should go on or not?

Mr. LEA. Oh, no; not in any way. We have a number of gauges in the Galops Rapids and the levels necessary to get a preliminary idea were taken under my directions, and when the gauges themselves were actually set I went up myself in a motor boat and indicated the points, and so on.

Mr. TAWNEY. Speaking of the Ontario hydroelectric commission, is its potential development at this point under the jurisdiction of the Province of Ontario exclusively?

Mr. LEA. I do not know about that. The data necessary for anything of this sort could not be obtained at the moment required, and it was suggested to the hydroelectric engineers, having seen what we had already, that the sooner the collection of data was commenced, the better.

Mr. TAWNEY. Do you say or do you not, Mr. Lea, whether or not the Ontario hydroelectric commission is making a study generally of all potential power within the jurisdiction of the Province?

Mr. LEA. I imagine they are.

Mr. TAWNEY. Do you think they are obtaining exhaustive reports?

Mr. LEA. Yes; that is my impression. Of course I believe they are studying the development of hydroelectric power all over the Province.

Mr. TAWNEY. And this is one of the powers that comes within their jurisdiction?

Mr. LEA. Yes.

Mr. TAWNEY. They are not here to oppose the work in contemplation?

Mr. LEA. I do not think they are. Our plans filed here have been also submitted to them so that they are quite cognizant of what they are.

Mr. TAWNEY. These plans have been submitted to the Ontario hydroelectric commission?

Mr. LEA. Yes; not formally, but the engineers have seen them.

Mr. KEEFER. Are you throwing out the idea that the Ontario hydroelectric engineers favor this work going on?

Mr. LEA. No. The mention of the hydroelectric has nothing to do with Waddington. I was simply required here to explain my knowledge of this, and to give my opinion of the future development of the whole river at Morrisburg. It just happens that I happened to be acting as engineer for both concerns.

Mr. KEEFER. Mr. Lea, it was suggested that probably you could give us an estimate of the total cost of a complete development at this point.

Mr. LEA. No; I do not care to do that, not yet, except to say that it will be, I think, a very attractive one.

Mr. KEEFER. It would be good power proposition?

Mr. LEA. I think so.

Mr. KEEFER. It would be an attractive one quite irrespective of the question of the regulation of Lake Ontario?

Mr. LEA. Yes; the regulation of Lake Ontario, which, naturally, we studied also, we considered as an added attraction, because it will help navigation and the powers below.

Mr. KEEFER. And it also begins at the right end of the river for both countries with respect to navigation and power?

Mr. LEA. Yes.

Mr. VAN KENNEN. Was there some explanation that you wanted to make, Mr. Lea, with reference to what was known as the Pitch by reason of this weir that was referred to by Mr. King?

Mr. LEA. I always objected to calling that a submerged weir, as you will remember, but it was only used for convenience, because I knew this matter would come up some time and somebody would think there was a drop over the top of it as if it was a weir, and there is not going to be anything of the kind. We have material enough if we are allowed to dump it in there, and it would be simply the slight increase in the slope of the earth over 500 or 1,000 feet or probably a little more. That increase would not be as much as the increase in the 400 feet which occurs at the Pitch.

Mr. VAN KENNEN. There was one other point with reference to the introduction of that so-called submerged weir and its effect upon the navigation interests at Lock No. 24, which I think was not explained.

Mr. LEA. If the filling up is carried to the extent suggested by Mr. Stewart, that is to fully compensate at the lowest low water, it will be sufficient to noticeably check the current in the river above. That is, this extra inclination which we are going to have down below will be taken from something up above, and, therefore, the current approaching the locks will be less than it is now. That is one of the difficulties that the navigators have stated that they experienced; so to that extent it will make the approach to Lock 24 a little easier, I should say.

Mr. POWELL. Mr. Lea, will you just point out to me what your idea is of this larger scheme of development? Where would you have the dam in the international channel?

Mr. LEA. We have not definitely located that, Mr. Powell.

Mr. POWELL. Just tell us in a general way, without definitely confining yourself.

Mr. LEA. If you were to consult carefully the resurvey maps showing the soundings which was filed yesterday, you would notice that there is a deep channel extending from the main channel of the river opposite Lock 23 over toward the Waddington shore between Clarke Island and the American shore and following up to a few hundred feet below the location marked "A," the proposed dam. That channel is a natural tailrace, and even at the present time it is carrying at ordinary water at least 70,000 cubic feet per second without noticeable velocity. We all saw that the day we examined the location. So that it is a natural tailrace of large capacity, and, of course, if there are any points or obstructions in it they can easily be removed by dredging. On the northerly side of that channel, so far as we know, at present the material is good solid rock at not very great depth. So if we can we would like to locate the power house—mind you, this is absolutely tentative and may be changed greatly—somewhere upon this hard material, following in a general direction the direction of the river and join Ogden Island, using it as a part of the dam, up to our own development at Waddington, which was to form a disjointed part of the total development. Below Ogden Island on this hard ledge of rock we would like to locate the power house and make use, with as little excavation as possible, of the natural tailrace.

Mr. POWELL. It would go, then, in about a north-northeasterly direction from Clarke Island?

Mr. LEA. It would go down not very far below Clarke Island.

Mr. POWELL. Then where would it go?

Mr. LEA. By that time we should have in turbines enough to develop the whole power. If not, we would have to follow around it in the direction it would next go—that is, toward the Canadian shore—and the regulating works would be where I think they ought to be—that is, the works which carry off the flood water—in the direct line of the main channel of the river as it exists at the present time.

Mr. KEEFER. And the lock system there also?

Mr. LEA. Yes; wherever it would best suit navigation and suit the American shore.

Mr. POWELL. The lock would not be a very considerable matter there?

Mr. LEA. It does not amount to anything.

Mr. JAMES WHITE. You said 6,000 feet in connection with the power house?

Mr. LEA. Yes; unless we can get a larger turbine.

Mr. KING. Mr. Lea, you suggested the obviation of the difficulty Mr. Stewart pointed out in the way of a so-called pitch over the submerged weir by extending the weir up and down stream a considerable distance and putting some slope in downstream.

Mr. LEA. No.

Mr. KING. Will you please explain, then, more clearly what you meant?

Mr. LEA. We would make that part of the river shallower than it is at present.

Mr. KING. And to an extent up and down stream in addition to the slopes of, say, 500 feet?

Mr. LEA. Yes; and probably 1,000 feet. I think we have material enough to do that.

Mr. KING. Do you suggest that the depth of water over the whole of that 1,000 feet would be the same both at the west and at the east ends?

Mr. LEA. No; it would be gradually getting shallower downstream.

Mr. KING. If it were 15.9, as Mr. Stewart suggested, at the crest of the weir upstream, it would run down to what figure at the lower end of the 1,000 feet?

Mr. LEA. If we made it exactly level down to that much less; but there is no particular reason why we should make it exactly level.

Mr. KING. You suggest that you would have some slope in it?

Mr. LEA. That much slope. It could hardly be called a slope.

Mr. KING. Enough to maintain a fairly equal depth?

Mr. LEA. Whatever is necessary to improve it for navigation. That is easy enough for us to do, and there is no reason why we should not do it.

Mr. KING. My point is whether there would not be a pitch still at the lower end.

Mr. LEA. No; I do not think that there would be what you would call a pitch at any place if the river were deepened in that way.

Mr. KING. And you think you could maintain the same depth of, say, 15.9 all the way down for the whole 1,000 feet, or would it be slightly increased?

Mr. LEA. I do not know whether Mr. Stewart's 15.9 was above or after the drop or what.

Mr. STEWART. I was giving the difference in elevation at the weir. The weir is 5.7 and then the head on it is 15.9.

Mr. LEA. Naturally, to begin with there is a slope there with the river surface itself. But if it were necessary, in order to maintain greater depth, to make it shallower at the lower end of this stretch of 1,000 feet, we could make it so. It is only a matter of dumping material. We much prefer to shut down a part of the plant on these extremely rare occasions when we have to, so we will not put it up where it will make any such difference as you suggest.

Mr. KING. I gather from what you say that it would be necessary to make something of a slope downstream in the extent of that 1,000 feet of the fill.

Mr. LEA. It probably would.

Mr. KING. And that the result of that would be a current of water down over the sloping surface?

Mr. LEA. Yes; the river would be passing over the bottom as usual.

Mr. KING. And the full discharge of the river, except what goes down the Little River, would be running down over the surface of this fill?

Mr. LEA. Yes.

Mr. KING. Maintaining the same depth at the lower end or gradually decreasing?

Mr. LEA. Possibly a gradual increasing depth; whatever would make the least disturbance in the river.

Mr. KING. You think you could manage it one way or another?

Mr. LEA. Absolutely without any trouble whatever.

Mr. KING. I want to find out from you also whether or not the current over the top of this fill would not just about equal the current down at Canada Island?

Mr. LEA. Possibly it might; but we would have a very large eddy on the south side.

Mr. KING. How would the eddy rise if you have a straight bank?

Mr. LEA. We have not straight banks. On the opposite side there is a point which makes an eddy which it is not necessary for the boats to use because they can come up the middle of the river there at the present time.

Mr. KING. Then it would be necessary for you to avoid making a straight bank up and down the river in order to provide for the boats up and down?

Mr. LEA. I think the conformation of the shores as they are at present would produce the eddies if they are necessary, which I am not sure they are, because that is a rather slack part of the river.

Mr. KING. And that is something that would have to be guarded against?

Mr. LEA. Yes; by whoever controls our works.

Mr. KING. I suppose we are at one on this, that a boat could not expect to get upstream contending with the currents; she would have to take advantage of the eddies or slack water.

Mr. LEA. I am not sure of that. There is a point opposite Lock 24 and a large bay just below on the south side. It is a very simple place to get out. This bank of ours does not cover a very long distance. I do not think that is the real difficulty, even coming upstream.

Mr. VAN KENNEN. Mr. Lea, do you consider that there would be any engineering difficulty in the placing of this so-called weir to produce the result, so far as the current is concerned?

Mr. LEA. There is no difficulty in placing that weir the way I have suggested.

Mr. VAN KENNEN. An engineer in charge of the installation of the work could regulate that perfectly?

Mr. LEA. Yes; it is simply a matter of dumping his material in the proper place.

Mr. VAN KENNEN. We are through.

Mr. MIGNAULT. That is your case?

Mr. VAN KENNEN. Yes.

Mr. MAGRATH. Is there any other evidence to be offered? If not, we will proceed now with the argument.

Mr. MCLEAN. I wish to offer some documentary evidence. I offer a certified copy of the report of the chairman of the judiciary committee of the Senate of the State of New York with reference to the act of March 16, 1826. (The act referred to was marked "New York Exhibit No. 4.") When it comes time to make my argument I can explain why it seems to me it is pertinent to offer that. I presume, however, it will be proper to offer it at this time, before the close of the evidence.

Mr. MIGNAULT. The date of these two documents would show that they were reports on this measure?

Mr. MCLEAN. It was on the result of this report that the act of 1826 presumably was based.

Mr. TAWNEY. Mr. Chairman, I would like to ask whether there is any objection on the part of counsel to the commission calling upon the engineer in charge of this United States district to furnish the report which their office has from the War Department on this application and the result of the surveys that were made, which are official, and of which we have the records in that office?

Mr. MCLEAN. On behalf of the State of New York we would like to have it.

Mr. VAN KENNEN. We are satisfied to have it.

Mr. TAWNEY. I think it would be well for the commission, Mr. Chairman, to have that as a part of the record in the case. Mr. Churchill testified to having the records in his office. They are all official.

Mr. KOONCE. I think, Mr. Chairman, I can promise to furnish the commission any data we have on our files or on the files of the district engineer bearing on this question.

Mr. MAGRATH. It is understood, then, that you will have it attended to, Mr. Koonce.

Mr. MIGNAULT. Is there any objection, Mr. Keefer?

Mr. KEEFER. No, sir.

Mr. MCLEAN. One other matter in reference to the admission of evidence, and that is this: On behalf of the State of New York, I would ask leave of this commission to have the engineers of the State of New York make a physical examination of the Little River for the purpose of determining what, in their opinion, is the natural flow, submitting that, first, to Mr. Van Kennen for any comments that he may care to make, and then submitting that to your honorable commission. I spoke of that to Mr. Van Kennen. I do not know whether he agreed to that or not. At the time I spoke to him about it I do not think he had any objection.

Mr. VAN KENNEN. I did not have any objection to the way I understood you to put it, and perhaps I have no objection now. As I understood it, if it were agreeable to the commission, some further investigation would be made with respect to that matter by the engineer who is to collaborate with our engineer, and if we agreed upon it, it was to be submitted; but I do not understand that he expects me to consent to an engineer who might be for some reason or other hostile and then to present the report without its being in accord with the view of our engineers and without a chance for cross-examination as to how he arrived at very important data. I did not understand that to be my friend Mr. McLean's suggestion. Anything that my engineers will agree to with his engineers I am perfectly willing to submit at any time to this commission.

Mr. MCLEAN. If our engineers agree with yours there would be no necessity of submitting a report. My suggestion was that we collaborate; that our engineers at the time of making their examination should make it in collaboration with yours, or accompanied by any engineer of your company, and then the result of the computations could be submitted to you by our engineers for any comments or criticisms that you might wish to make, that report then to be transmitted to this commission with any criticisms or comments on the computations.

Mr. MIGNAULT. Perhaps there would be less objection, Mr. McLean, if the engineers of the applicant should accompany our engineer in the survey.

Mr. MCLEAN. That is my suggestion.

Mr. MIGNAULT. Because possibly the question with which the applicant is concerned is how the survey is made. If the applicant were represented by their engineer there would appear to be no difficulty in your engineer reporting his conclusions.

Mr. VAN KENNEN. I do not quite understand that. Suppose, for the sake of argument, that the engineer of the department, in whom I have confidence, should come there for the purpose of determining the cross sections of that stream in order to determine what might be what we call the natural flow, and which we claim we have a right to under our grants and the law, even though our engineer were there present at the time and made the soundings. Now, he says, "I have struck the silt here and I am going to stop. At this elevation I am going to say that the depth of that water is 6 feet at this point." My engineer says, "That is not fair at all. You ought to take into account that that is a submerged lock or that that is a patent deposit there." "No; never mind that; I will say that this is 12 feet or 6 feet or 3 feet." Now, I would not like to have that report go before this commission without an opportunity to determine whether he did make any allowance for natural deposits or siltage or even submerged locks and a thousand other things that might have been accumulating there for a hundred years.

Mr. TAWNEY. Sawdust, for instance.

Mr. VAN KENNEN. Sawdust and everything you can think of in that Little River. I have not the slightest doubt but what they would find there submerged rocks absolutely covered with dirt. I do not know that that is so. I am perfectly willing if we agree upon the figures whenever they want to take them to submit that matter to this commission.

Mr. KEEFER. It seems to me in view of Mr. Stewart's testimony that examination of the Little River should be made in order to ascertain what was the natural flow of that river. It is a matter of concern to the State of New York and not Canada. That report ought to come in here, and if the applicant differs he should have the right to attack it. We are prepared to accept it if made by the New York State engineers. It concerns them and does not concern us. It is a matter between the company and the State of New York.

Mr. VAN KENNEN. If I have assumed that the engineers of the State or the engineers of any department were final in this matter——

Mr. KEEFER. You should have the right to attack it if you can show any error in it.

Mr. VAN KENNEN. That is what I want an opportunity to do.

Mr. MCLEAN. If Mr. Van Kennen wishes to cross-examine or in any way attack the report of our engineers I would not for a moment cut him off from that right. I simply assumed that our engineers in collaboration with his could undoubtedly find such facts and report on them perhaps independently; that both he and I, if there was a difference, could lay such difference before your commission so that you could reach a determination. If he wishes an opportunity to cross-examine I should be delighted for him to have it.

Mr. TAWNEY. How would this do? If there are any differences between the engineers of the applicant and the engineers of the State of New York, submit their differences to the United States district engineer and Mr. Stewart to adjust before submitting them to the commission, and then submit the conclusions of the two Federal engineers rather than the conclusions of the engineers of the State and those of the applicant.

Mr. MCLEAN. That would be satisfactory to us.

Mr. MIGNAULT. I do not know whether that would be entirely regular. The commission, of course, can cause a survey to be made of the Little River. There are certain points disclosed by the evidence which possibly may throw some doubt on the survey which was made by Mr. Tucker. There has been some dredging at some time, and we have had no evidence except the fact that there has been dredging. On the other hand, there is a question of doubt as to how long some of the silt may have been in the Little River. It may have been there for centuries for all we know. Apparently, Mr. Tucker made his soundings in every case by trying to get to the bottom of the river and get through the silt. We have nothing to show—barely a presumption and not a very strong one at that—what was the condition of the Little River at the time when this dam was constructed. It may be impossible to determine that.

Mr. VAN KENNEN. It will be difficult, at least.

Mr. MIGNAULT. But in view of the uncertainty of the evidence it might be conducive to a just solution if the commission should order some survey to be taken, and I think you should be represented on such a survey, Mr. Van Kennen, and I think you should have every right to cross-examine the engineers to determine how they proceeded with it. I do not think you are called upon to give a consent to any survey unless you have this opportunity.

Mr. VAN KENNEN. That is about what I thought.

Mr. MIGNAULT. The commission of its own motion could order the surveys to be made and the commission would naturally give you every opportunity to be represented or to make any observation that you desire. That would be the ordinary proceeding in any court.

Mr. VAN KENNEN. I conceive that ought to be satisfactory to us. I see no reason why it should not.

Mr. TAWNEY. This is a matter in which the decision of the court is final, and the rights of the parties must be protected the same as in any case before a court of final jurisdiction.

Mr. VAN KENNEN. I have doubt that it would be right for me to say that I should take this as final without an opportunity of examining into it.

Mr. POWELL. There is one feature of this, this is a gradual accretion. What about that?

Mr. VAN KENNEN. If it is a gradual accretion it might have the same effect. I regard it as merely a deposit in our forebay.

Mr. POWELL. Suppose it is a deposit.

Mr. VAN KENNEN. Then I take it that we have the right to take it out. It would seem to me that the law is clear that if a sunken log gets into my forebay I would have the right to take it out.

Mr. MIGNAULT. There is this further consideration, that whether the natural condition of the Little River had been modified or not,

what you ask is to take from the main river a quantity of approximately 27,000 c. f. s., and the commission is obliged to consider that as being taken from a navigable river. I do not think, from my point of view, that we are concerned with a condition that existed 100 years ago or more. What concerns us is as to the effect it will have on a navigable boundary water, and speaking for myself alone the impression I have at this moment is that it seems to me that it is not very material what was the condition of the river in a state of nature. But what appears to me very important is the effect of this diversion of 27,000 c. f. s. from the main river over the 3,000 c. f. s. which now goes down the Little River. That is my view.

Mr. VAN KENNEN. I feel this way about it—we have been there for 100 years; we have been operating our plant there continuously on the rights which we thought we acquired by virtue of the grants and by virtue of the statutes of the State of New York, which, if I understand the law of the State of New York, gives us the right to the natural flow of the water. Now, I would assume that within the jurisdiction of this commission, with respect to its powers, in relation to levels that it would respect a right as ancient as that and not leave it in the position where it might be said that because you affect the level at, we will say, the locks, which have been constructed there many many years after our plant was constructed, that you would then either justly or as a legal right say that we can not take what we have had for 100 years. That was my view of it, whether I have stated my position in regard to that or not.

Mr. MAGRATH. You will deal with that in your argument.

Mr. VAN KENNEN. I certainly shall.

Mr. MAGRATH. What are we to do with this application now?

Mr. TAWNEY. This request is made for Mr. Van Kennen to submit the result of his survey to the commission, and Mr. Van Kennen, for reasons which he has stated, declines to give his consent to submitting the report under these circumstances.

Mr. KEEFER. In view of the testimony we have had here, do I understand that Mr. Van Kennen objects to a survey of this river being made by the State of New York, in order that they could check it up? They are interested in the matter to the extent of any surplus above the natural flow. Does he object to the State of New York ascertaining what that data should be?

Mr. VAN KENNEN. Certainly not.

Mr. KEEFER. When they bring in that report you would have the right to check it.

Mr. TAWNEY. That would be reopening the case.

Mr. KEEFER. Well, there is no hurry in deciding this case; the applicants do not want to build immediately.

Mr. MIGNAULT. If the commission ordered a survey of the Little River, the case would have to be reopened if the parties desired to be heard on the report.

Mr. MCLEAN. And my suggestion was to obviate the necessity of reopening the case; that was the form which my suggestion took.

Mr. TAWNEY. But if your engineer and the engineer for the applicants disagree as a result there must be some way in which that agreement could be determined; it necessarily involves the reopening of the case.

Mr. McLEAN. My idea was that Mr. Van Kennen could take what differences there were and comment upon them in a brief to this commission, and make such argument as he desired to show that his survey was right.

Mr. TAWNEY. Of course, he should have the right of cross-examination.

Mr. McLEAN. I certainly do not want to deny any right that he has and that he wishes to assert, and therefore I make my application in this form:

"That the State of New York, through its engineers, be allowed to make a physical examination of the Little River for the purposes of determining the normal flow, and submit that report to this commission."

Mr. POWELL. Go further—and if the applicant desires to have his engineer collaborate with those engineers he can do so.

Mr. McLEAN. We would be glad to have their engineers do so.

Mr. TAWNEY. In effect, your request is that the further hearing be suspended for the purpose of allowing you time sufficient within which to make your survey of the Little River and present the result of that survey to the commission at a future hearing.

Mr. McLEAN. That is exactly it.

Mr. TAWNEY. It means the continuance of this hearing.

Mr. VAN KENNEN. I suppose this is an application for the continuance of the hearing.

Mr. TAWNEY. That is what I understand.

Mr. McLEAN. Mr. Perkins, our engineer, tells me that in his opinion the actual examination would not extend over one week. So far as I know, he could proceed with it at once.

Mr. TAWNEY. The time for this hearing was set on the 13th of August; there was nothing done since that time by you to make any survey of this river.

Mr. McLEAN. No; except the casual examination which Mr. Perkins made and about which we heard his testimony.

Mr. MIGNAULT. Could you not do this, Mr. McLean: You could have the engineer of the State of New York make a survey; you could then communicate with Mr. Van Kennen, and if you think it is of sufficient importance, then you could ask to be heard by the commission as to this survey, and give notice of that to Mr. Van Kennen. We must adjourn this case to a future date, when we will consider what order we should give or whether we should give any order. So, independently of any present order of the commission, you could have this survey made and then, so far as you are concerned, Mr. Van Kennen, you could, if necessary, apply for a reopening of the case to put your view of the survey before us. It would not require very much time, and the argument on the general case can be proceeded with at this meeting. I think it would be a great advantage to hear what counsel now present have to say, when all the facts are present in our minds.

Mr. McLEAN. That would be perfectly satisfactory to me. My idea was not to postpone in any way the present hearing, but merely to allow us to file this as a supplementary piece of evidence.

Mr. MIGNAULT. You go ahead and have the survey made and then give notice to Mr. Van Kennen.

Mr. VAN KENNEN. I think we could all agree to that.

Mr. MIGNAULT. I would suggest that at least Mr. Tucker should be present when the survey is made. That would be more satisfactory to the other side, and then if they agreed after the survey is sent to us, it could be sent. If there is a disagreement you could apply for a reopening of the case to be heard as to the survey merely.

Mr. MCLEAN. And as to that only.

Mr. MIGNAULT. And as to that only.

Mr. MCLEAN. That would be satisfactory to us.

Mr. MAGRATH. Is that satisfactory to you, Mr. Van Kennen?

Mr. VAN KENNEN. Yes.

Mr. POWELL. There is an important consideration about the argument in this case. Our sixth commissioner is not here.

Mr. TAWNEY. We can have an executive session and discuss that.

FRIDAY, OCTOBER 4, 1918.

Pursuant to the adjournment, the commission reconvened at 10 o'clock a. m.

Mr. MIGNAULT. Mr. Chairman, before the proceedings begin this morning I wish to make a statement. I have read with surprise an editorial in the Montreal Gazette of yesterday referring to the application which is on trial before this commission. This article suggests that the applicant now comes forward and asks for something which the success of the St. Lawrence River Power Co. in a recent application before the commission encourages it to believe they can get. It also states that the Governments and people of both Canada and the United States, being now preoccupied with the conduct of a great war, the time for a raid on public rights near at home is to that extent propitious. The article closes by saying:

> It is to be hoped that the application of the New York & Ontario Power Co. will receive from the International Joint Commission the summary treatment which, prima facie, it seems to deserve. The resolute refusal of three Canadian commissioners in a tribunal of six would be sufficient.

Making every allowance for a possible intention to merely advocate a due regard for public rights in a great waterway, I think, nevertheless, that there can be no doubt as to the impropriety of such an article which comments in this manner upon a case which is sub judice before this international tribunal, and the suggestion that the three Canadian commissioners resolutely refuse to entertain the application and thus preclude any possibility of its being determined on its merits, I can not regard otherwise than as an insult, which I hope was not deliberate, to the honor and integrity of the Canadian commissioners.

The facts suggested in the article as to the circumstances under which this application was made are entirely wrong. The application was filed before the commission on April 24, 1918. It first came on for trial in Atlantic City on August 12, and it was while it was being tried that the application of the St. Lawrence River Power Co. was presented to the commission. The present hearing is solely an adjournment of the hearing in Atlantic City.

I have, however, nothing to do with the motives of the applicant, but I have a great deal to do with the unveiled suggestion that three

Canadian commissioners, of whom I am one, should resolutely refuse to entertain the application. The Canadian commissioners, as required by Article XII of the treaty, have made and subscribed a solemn declaration that they will faithfully and impartially perform the duties imposed upon them by this treaty, and now the suggestion is made—and I hope again that it was not made deliberately—that we violate and disregard this solemn obligation. I can not really conceive of any newspaper, certainly not a newspaper of the standing of the Gazette, making such a suggestion in a pending case to the members of any law court in Canada or the United States, and I regard it as all the more unfortunate since it is made by a Canadian newspaper to the Canadian members of an international court in a case brought before that court by a corporation of the United States, our ally in this great war.

May I also say that this treaty, which is a most notable advance in the direction of universal international arbitration, would speedily become a dead letter if the members of this tribunal of six were to divide equally on international lines without any regard to the claims of justice and honest dealing and without any respect for the solemn oath of impartiality which they have subscribed.

Mr. KING. Mr. Chairman and gentlemen, I am sure that counsel present have in mind some comment upon this identical matter, and I intended in the opening of my brief remarks to go over something of the ground covered by Mr. Mignault.

As representing one of the important interests before the commission, and with no intention whatever of doing what would be highly improper and exceedingly impolitic; that is, expressing any opinion as to the action taken by the commission upon the application of the St. Lawrence River Power Co. or with regard to the series of events extending over a year, which ultimately placed the commission in a rather embarrassing position relative to that application—I think it is the duty of counsel to deplore and to condemn in the strongest terms such a mistaken idea of the duties and functions of this international tribunal as is betrayed in the article now in question and in leading articles and editorials in many Canadian newspapers. The attitude expressed in these articles deprives this commission entirely of its judicial character, divests its members of the right to determine questions according to their best judgment. It puts counsel in the position where its sole duty is that of flag waving. It makes the members of the commission pawns in the hands of players at Ottawa and at Washington, and it puts counsel and expert witnesses who are giving valuable time in the effort to bring the real facts before the commission in the position of merely wasting their time in a very foolish manner.

And, sirs, I want, on behalf of counsel here, to say in the strongest and most emphatic way that I indorse what has been said by Mr. Mignault. I regret and deplore and condemn the careless and inaccurate estimate of the duty of the commission, and I do hope that the Canadian public will realize the spirit in which the treaty of 1909 was drawn; that they will realize the vision of those who drew that treaty and who brought it to a fulfillment; that the commission would serve an extremely useful and extremely far-extending purpose as between the two great countries, a purpose that perhaps

has not yet been realized by the general public in Canada, covering ground far outside the mere boundary waters now in question. And I hope, sirs, that when any of us are addressing you the commission will understand that we feel that we are before a tribunal the members of which know that they are entitled to and that they are expected to and will bring to the consideration of the questions before them calm, dispassionate, and unbiased judgment, and will reach a decision without fear of any results and without fear of any person or nation. Such a decision is the only one which will be in accordance with the treaty of 1909.

Mr. McLEAN. Mr. Chairman, on behalf of and as counsel for the State of New York may I be permitted to make a very brief statement on this subject? Frankly, it would hardly seem to my mind worth the attention of this commission or of counsel here to take seriously such an article as has been referred to. It is too small, too prejudiced, and too biased to really disturb this commission or counsel. However, since the matter has been brought up, I want to assure you, sirs, that I most heartily and fully indorse everything that Mr. King has said, and I can assure you on behalf of the State of New York that we realize the high functions of this tribunal, representing, as it does, the agreement between the high contracting parties who have vested in this tribunal that great duty of determining points of common interest between the two countries, and thus removing the cause of possible friction which might result in the future in such terrible and disastrous conflicts as we see about us to-day.

With this idea in mind we have every reason to believe that the two high contracting parties have placed on this commission men of ability, of standing, of reputation in their communities, whose character and attainments are far above such improper attacks as have been disclosed by this newspaper article.

On behalf of the State of New York we lay before you, sirs, our rights in this matter, opposing it as we do, but with every feeling that high and even justice will be administered in your decision.

Mr. KOONCE. Mr. Chairman, I would like to say a few words also. I was very much gratified by the statement made by Mr. Mignault, and I can assure you that neither he nor any other member of the commission was as indignant as I was when I read that article in yesterday's Gazette.

I have been associated with this commission since 1912 and have represented the United States in a majority of the important cases it has had before you since that time. I do not know of any decision rendered by this commission that, to my mind, has not been in accord with what was right and just. If I had a case for judicial determination, personally or otherwise, I should not hesitate to trust it to the decision of the six men who now compose the International Joint Commission.

Mr. VAN KENNEN. Mr. Chairman, possibly, as one of the attorneys for the applicant, I ought not to say anything in connection with this matter. We are now approaching the final determination of this question, and I want to assure you that so far as the interests of my client are concerned we are approaching it with the fullest confidence that the members of this commission, particularly the members of the Canadian section, will give us justice in this matter. That, of

course, is all we can expect, and we feel every confidence that such will be the result, notwithstanding this incident that has unfortunately arisen through the publication of this article, which, in fact, is untrue in many respects.

I concur entirely in what Commissioner Mignault has said in his statement, and I would not change anything in it, except I might state that the first application was presented to the Secretary of War over a year ago, and it was upon that application that I was advised as counsel for this applicant that they had adopted a procedure whereby matters of this kind should be first passed upon by this commission before giving their final approval. The reason assigned in words, as well as in inference, was that this commission was clothed with ample powers to get at the true facts that were difficult, at any rate, for the War Department to obtain. It was for that reason that this second application, so to speak, as Commissioner Mignault has said, was filed first in April of this year. The delay from last year to this, or whatever time there was a delay, was in getting the reports of our engineers upon the very vital questions that we have presented to this commission.

Mr. MAGRATH. Gentlemen, on behalf of the members of the commission I am sure I express their opinion when I say we are very grateful for the way in which you referred to the commission and the important work we are called upon to perform.

Are you ready to proceed now, Mr. Van Kennen, with your argument?

ARGUMENT OF MR. VAN KENNEN ON BEHALF OF THE APPLICANT.

Mr. VAN KENNEN. Mr. Chairman and commissioners, I shall endeavor to be as brief as possible in my remarks to this commission with respect to the application of the New York & Ontario Power Co. I shall endeavor to confine myself as much as possible to the facts, discussing only my views of the law where I think it is necessary in the belief that possibly all of us will ask to file supplemental memoranda of the legal questions, and with that idea before me I want to begin my statement with this:

That prior to the year 1808 the State of New York granted unto the predecessors of one Ogden the title to the lands on the south shore of the St. Lawrence River at Waddington. At that time and prior thereto Ogden and his associates were the owners of all the lands south of the Little River, covering the riparian rights and covering the situs involved in this application.

Mr. POWELL. Were they the owners before you got the grant, or do you mean that that was covered by the grant?

Mr. VAN KENNEN. I mean that the grant did not go directly to Ogden, but in 1808, at the time of the first legislation of the State of New York with respect to the water rights and privileges, he and his associates had acquired all the property on the south shore.

Now, I will not, of course, read into the record all of these grants, of which there were six in number, but I will read one merely wherein the State of New York granted unto the predecessor of Mr. Ogden in title in the year 1788:

All that certain tract or parcel of land situate in the county of Montgomery (now St. Lawrence), on the south side of the River St. Lawrence, consisting

of lots Nos. 1, 2, 3, 4, 5, and 6, in the township of Madrid (now Waddington), as delineated on a map hereof filed in our secretary's office, together with all and singular the rights, hereditaments, and appurtenances to the same belonging or in any wise appertaining, excepting and reserving to ourselves all gold and silver mines and 5 acres of every 100 acres of the said tract of land for highways.

Now, each of the grants contained practically the same identical language with respect to the other lots in question. In passing here I want to say that, as the law stood on that date in the State of New York, that conveyed to the grantee the title to the bed of the stream on nonnavigable waters. In other words, I want to say that that grant, in the terms in which it was made, would give to the riparian owner the title to the bed of the stream in all nonnavigable waters.

A little later than 1808 there was a grant of the island property. Now, that was Ogden Island, which was the north side of that stream, and of which so much has been said. That grant was this:

All that certain land known and designated by the name of Isle au Rapide Plat, situate in the River St. Lawrence, opposite village of Hamilton (now Waddington), in the township of Madrid (now Waddington), in the county of St. Lawrence, containing 763 acres, together with all and singular the rights, hereditaments, and appurtenances to the same belonging or in any wise appertaining, excepting and reserving to ourselves all gold and silver mines; to have and to hold the above-described and granted premises unto the said Daniel McCormick, predecessor in title to Ogden, his heirs and assigns, as a good and indefeasible estate of inheritance forever.

I shall repeat that that grant, under the law of the State of New York, would give to the riparian owner of the island of Ogden title to the bed of the stream to the center thereof.

Returning for a moment to the date 1808, we have an act of the legislature which, I take it, influences the situation. In that year the Legislature of the State of New York passed an act in which it was recited that Ogden and his associates were the owners of the riparian lands on either side of this Little River, and had, prior thereto, constructed a dam at that place. As a matter of fact, I get from history that the dam was constructed in about the year 1803–4, and, consequently, the dam was in existence when this act was passed. That act authorized Ogden and his associates, the riparian owner and the owner of the dam, to build a canal with locks and dams and all other necessary work to make the Little River a complete navigable stream for the passage of boats up and down the St. Lawrence River. I would like the commission at this point to visualize the situation at that time and to keep in mind that in the year 1808 on the north of this island were these tempestuous rapids that have been described by witnesses in their testimony here. In those days it was absolutely impossible to navigate the St. Lawrence River westerly of that point except in the most primitive way by hauling the bateaux, drawing a few feet or a few inches, I may say, of water, up along the shore of the north channel. The State of New York, in the interests of navigation, authorized the owners of this property on either side of this Little River, who had prior to that time constructed a dam across the river at exactly the point where it now exists and where it has existed from that date to this, to construct locks and to maintain its dam and to build a canal and to improve, I say, that stream for purposes of navigation. It also went further than that; it gave those people the right to make certain charges for the use of that canal and those

locks; it specified particularly the amount that might be charged, and it also authorized these people, Ogden and his associates, at that time to impound the water by the maintenance of this dam or the construction of others, and to use that for their own industrial purposes, as well as to dispose of that water for industrial and commercial purposes. The only reservation made by this act was, first, a limitation upon the amount of tolls that they could charge, and, secondly, a limitation as to the time they could charge those tolls, namely, 75 years, after which the State reserved the right to a readjustment of their tolls.

From that day, so far as history tells us, and certainly so far as the evidence shows—and we did introduce some evidence carrying us back a great many years; perhaps not as far as 1808 or 1826, but the witness Rutherford, a man of very advanced years, said that during all his lifetime—there were numerous mills erected on this dam that utilized the water for commercial purposes. It is therefore inferable, and I believe, without question, true, that from the date of the construction of that dam, namely, in 1803, there began then and there commercial enterprises, mills, factories, and other works, built, in solid mass, from the island side of that dam directly across the bed of this stream to the south side. And lying behind this dam was, from one end to the other, a series of mills and factories drawing water from it for their operation.

Not only that, but the evidence is clear that upon the strength of the act of legislature of 1808 they actually constructed and operated a canal. And for years that canal was operated just in compliance with the authority granted to these people by the act of 1808.

Now, we will return again for a moment to the act of 1826. I will not read all the act, but the substance of it, so far as it pertains to this matter, is this: That they granted to Ogden, who had then acquired all the interests of his associates in this property on both sides, the land below the dam susceptible of improvement to the navigable waters thereof—

Provided, Nothing contained herein shall operate to prevent the people of the State of New York, after seventy-five years from April, 1808 (which was the date of the prior act), from altering or regulating the tolls: *And provided further*, That nothing in this act contained shall be taken to prevent the State from taking below the dam water for the use of any navigable canal constructed by the State.

I confess that there is some obscurity in this matter, but I take it that it is perfectly clear, at any rate, that the legislature by this act granted unto Ogden at that time the absolute title to the bed of the stream below the dam to the navigable waters. To explain that I must return again for a moment to the testimony that has been given, where it appears for a distance below the dam there were shallow waters, after which there was a drop in the deeper water, and there were witnesses who testified that to-day there is navigation for boats of full canal size that come up or go downstream from the island and to the wharf at Waddington. Now, that is one matter. I say that the language of that statute, perhaps, is further involved in some mist when it says, "To the navigable waters below." What did they mean by that? They evidently meant that the waters above were not navigable, and I am putting some stress

upon this in order to ascertain what was in the minds of the legislators and of the people at that time.

Mr. TAWNEY. You mean between the navigable waters below and the dam the waters are not navigable?

Mr. VAN KENNEN. Yes, sir. It is a fair inference; that is all I want to say.

Mr. MIGNAULT. But, as a matter of fact, your evidence would tend to show that the river was navigable above and below the dam in a state of nature.

Mr. VAN KENNEN. It depends, Mr. Mignault, altogether upon what we mean by "navigable," and that will be a part of this argument from my standpoint.

Mr. TAWNEY. Just for my own information, let me ask this question: When this act referring to the grant from which you are now quoting was passed, was the dam in existence?

Mr. VAN KENNEN. At the time of the act of 1826 the dam was in existence.

Mr. TAWNEY. I gathered from your reading of the act that the lands granted are all below the dam?

Mr. VAN KENNEN. Yes, sir; I think that is fair.

Mr. TAWNEY. And the extent is limited by the navigability of the water below the dam, which is some distance below?

Mr. VAN KENNEN. Yes; that is, it covered the nonnavigable stretch of the stream between——

Mr. TAWNEY. Well, there is a nonnavigable stretch, of course, with the dam there.

Mr. VAN KENNEN. But undoubtedly it referred to the nonnavigability of the stream itself. It would have no meaning if it did not.

Mr. TAWNEY. But independent of the dam, there was navigable water below the dam?

Mr. SPRATT. Some distance below the dam.

Mr. TAWNEY. I mean that for some distance below the dam there was navigable water.

Mr. VAN KENNEN. Absolutely.

Mr. TAWNEY. So that your grant is limited, according to the description, to the navigable water up to the dam or the land between the navigable water and the dam.

Mr. VAN KENNEN. Perhaps I ought, in that connection, to refer to the testimony of Mr. Lea, our engineer. He spoke of the Hogs Back, which was on the north side. Now, he says that Hogs Back runs directly across the island and the south shore is that part from the dam down to the deeper waters below. Therefore, I say that from the present site of the dam below that was this Hogs Back on the south shore that corresponds to the Hogs Back on the other shore, but probably not any considerable amount of water—I do not mean that—but I mean that it was shallow at that point. I am not defining it, but I am stating what was evidently in the mind of the man who drew this statute.

Mr. TAWNEY. That is what I want to get at, whether or not he had in mind the fact that this dam was there at that time and that there was a stretch of the river that because of the dam and because of the physical conditions was unnavigable, but that there was a certain point farther down that was navigable.

Mr. VAN KENNEN. I will pass that on this assumption, that it is a

little obscure; I will admit that; and possibly a little inconsistent from some standpoints, but at any rate, that was what they did.

Mr. MIGNAULT. May I ask you if the purport of your argument, Mr. Van Keenen, is to show that the Little River above the dam was nonnavigable and that, therefore, the grant of property on the river went to the bed of the stream?

Mr. VAN KENNEN. That is precisely what I want to show. Now, in view of that I want to say this, that there was introduced after being given to me through the kindness of Mr. McLean, representing the State of New York, the report of the chairman of the judiciary committee of the State of New York, bearing date the 16th day of March, 1826. I think it has a sufficient bearing upon the whole situation and that I ought to read it.

Mr. Viele, from the committee on the judiciary, to whom was referred the petition of David A. Ogden, of the county of St. Lawrence, reported as follows, to wit: That the prayer of the petition is, in effect——

Mr. TAWNEY. Was this a report on the bill?

Mr. VAN KENNEN. On the bill, evidently.

Mr. TAWNEY. It was a report to the Senate?

Mr. VAN KENNEN. Yes, sir. I take it that it is a fair inference that upon the strength of this report that bill was passed. The report states:

That the prayer of the petition is, in effect, that the State will release to the petitioner and to those who have purchased under him all the title which the State may have to that part of the bed or soil of the River St. Lawrence which lies between an island in said river called Isle au Rapide Plat and the continent or main shore. It appears from the representations of the petitioner that he is now the owner of the above-mentioned island and of the lands opposite thereto; so that he is the proprietor of the shores on both sides of the branch of the river which divides the island from the continent. That in 1809 the petitioner and his associates were authorized by an act of the legislature to erect a dam from the main shore to the island and to construct locks and exact certain tolls for the passage of boats through the same.

As a matter of fact, the dam had already been constructed.

They were also authorized to take from the dam the water which might be requisite for mills and other works. The rights granted by the above-mentioned act were limited to seventy-five years, eighteen thereof having nearly expired.

Now, of course, it is not quite that, because, as we maintain, the limiting was to the right to charge so much per ton for tolls. It did not limit our right to have the dam there at all, nor to use the water there, but it merely was a regulative statute for the purpose of controlling the fact that in 75 years from that date they might impose different tolls. However, I will pass that, because the act itself would probably be better than this petition.

The petitioner [that is, Ogden] further represents that a permanent dam with a lock has been erected across the said river by the petitioner and that various buildings for manufacturing purposes have been erected and are now erected on the bed of that part of the St. Lawrence which by the operation of the dam has been rendered occasionally dry.

The petitioner further represents—

and it is testified to by a witness whose deposition has been submitted to the committee—

that the branch of the river which is between the island and the main shore was unnavigable in its natural state for boats, though rafts went down occasionally, at much risk and generally with loss.

They undoubtedly went over this Hogs Back below the dam.

The same witness further states in his deposition that below the dam there is a space which, when the water is low, is not covered with water, but that during the summer season, when the river is high, its bed is covered with water to the height of about 18 inches.

The petitioner [now, that is Ogden] claims to have title, in virtue of his being the owner of both shores, to the bed of the soil of the river which lies between the island and the main shore, and represents that he has been advised by counsel that his claim is well founded, but, apprehending that doubts may be entertained on this subpect and that any uncertainty as to his title may affect the value of the manufactures which have been erected and are erecting below the dam, the petitioner desires to have his title confirmed by a relinquishment of all rights which the State may have by an act of the legislature.

The committee do not feel themselves called upon to give any opinion as to the petitioner's claim of title. They conceive it only requisite for them to state the facts which have been presented to the committee, that the Senate may judge how far it may be proper to grant the prayer of the petitioner. It appears to the committee that if, as they believe, a reservation of that part of the bed of the river which lies between Island au Rapide Plat and the lands of the petitioner on the main shore could be of no advantage or use to the State, the prayer of the petitioner may be granted, more especially as such a grant will tend to encourage many very useful enterprises and manufacturing establishments, which will be benefited by a relinquishment of any title which the State may have to the land in question. The committee have, therefore, prepared a bill by which the State will relinquish any claim to the lands under the waters of the strait which divides the island from the mainland, with a reservation to the State to take from it any waters which may be required for canal or internal improvements, and reserving to the State also a right to regulate the tolls at the lock built by the petitioner after the before-mentioned term expires, namely, seventy-five years, it having been represented to the committee that the lock is on the land of the petitioner and does not occupy any part of what was the natural bed of the stream.

Now, if the statute had been passed with that clear perception that Mr. Viele exhibited when he made his report, there would have been no doubt at all confronting us in this matter at this time. And it may be observed here that his recommendation was that if the State had any title to the bed of that stream from the upper reaches of the island to the lower reaches, it should be granted to Ogden.

That brings me to the point raised by Commissioner Mignault as to our point of view.

Mr. MIGNAULT. It was only an inquiry as to your position.

Mr. TAWNEY. Was the bill accompanying that report enacted as reported, or were there amendments?

Mr. VAN KENNEN. I can not tell that. I can only speak of the act and this recommendation; but I want to say that the act did not exactly follow this report, so there is a presumption that it was probably amended.

Mr. TAWNEY. In what respect did it differ?

Mr. VAN KENNEN. In this respect, that this recommended the whole stretch of the stream from the intake to this lower stretch. The act, for some reason, seemed to have granted specifically only that part below the dam.

Mr. TAWNEY. And above the navigable water below the dam?

Mr. VAN KENNEN. Yes; that is a fair interpretation of the two papers as I have them before me. I do not know what was in the mind of this committee. It was of two minds in one respect. He did not commit himself as to whether the riparian owners owned to the bed of the stream. That is one thing that he was sidestepping, and I do not blame him for sidestepping it, either.

Mr. TAWNEY. Well, it was not necessary for his purpose.

Mr. VAN KENNEN. No, it was not. Then the statute followed, with the grant below the dam. They may have had two ideas. In 1808 there was an act passed which authorized them to canalize that stream and improve it, to build dams in it, and to build locks in it—that is, at the dam—or to build other dams, and to grant them the right to sell the water from that impounded stream. And the legislature may have reached the conclusion that that granted to these people all rights that were requisite above the dam. I agree with that interpretation, so far as I am concerned individually. In other words, the State of New York made a grant to these people at that point canalizing that stream, authorizing them to improve it, to do what they chose with it in order to utilize it for navigation purposes. And I believe that the legal presumption necessarily follows that when you do that you give them all the right that they need above the stream.

Mr. TAWNEY. That may be the interpretation of the Senate, and may account for the modification of the bill.

Mr. VAN KENNEN. It is more than likely that that is true.

Mr. TAWNEY. It may account for the fact that the committee's recommendation was not fully adopted.

Mr. VAN KENNEN. I think that is a fair inference, and I believe it to be the truth in regard to that. But I have another statement to make in regard to that matter. I want to say upon that point that the question of the title to the bed of the stream is dependent upon the definition which you give to the word "navigability." The old idea of a navigable stream was the rule which has come to this country from the common law of England and refers entirely to the streams in which the tide ebbs and flows. In England, under the rule that was existing at that time, if I understand it correctly, no stream was navigable except where the tide ebbed and flowed. Therefore, the Niagara River would not be navigable. Many of our other streams would not be navigable under that rule. The St. Lawrence River at this point would not be navigable. I might multiply those illustrations.

Therefore, if you apply that definition, the counsel who advised Mr. Ogden with reference to that matter was undoubtedly right, that when they granted that to the riparian owners they owned severally on either side to the the bed of the steam. But I want to say in this connection—and it may be going too far, although I do not intend to—that in my opinion as a lawyer who has given some consideration to the question of this and similar points, that when in 1808 and in 1826 those acts of the legislature were passed, that that act if passed upon by the courts of the State of New York at that time would have given to Ogden the title to that stream without any question at all. What effect the changes of principles of law may have upon a man's title once fixed I do not know. I suppose it ought to be the reasonable principle that if a man once acquired a right which was a full right at the time he acquired it, no subsequent legislation or even interpretation of the statute should deprive him of that right.

But I pass along a little on that point, and I will come to this: I said that under the common law of England, if that law were prevailing to-day, there would not be any argument here. The title to

the bed of that stream would rest in the applicant in this case. But, perhaps unfortunately for us, although possibly fortunate for a great many other people, the common law of England on this subject is not applicable to the waters of the State of New York to-day.

Mr. POWELL. Well, your courts have held that it is.

Mr. VAN KENNEN. I beg your pardon. I am coming to that, I think.

Mr. POWELL. Down as late as 83d New York they held so.

Mr. VAN KENNEN. I do not think we will differ when I get through. I want to say this, that there came a change in the law and the English rule, as I understand it, was extended in our country so that navigable streams were no longer defined by the definition of the ebb and flow of the tide, but were defined upon some other basis. Therefore, the definition was extended so that the Niagara River became a navigable stream in the eyes of the law of the State of New York. The St. Lawrence from one end of it to the other became a navigable stream. The Hudson was a navigable stream, although for a different reason, namely, that the English rule did not apply. The Mohawk was called a navigable stream for a different reason, namely, that the State reserved its rights in that. I understand the rule of law to be to-day in the State of New York that the Erie Canal, a ditch dug through the State of New York, wholly artificial, has become navigable waters, so far as interpretations are concerned. Now, you can see the change that took place.

Mr. KING. The only trouble was the lack of boats, I suppose.

Mr. VAN KENNEN. I can not give the reason always for the rule, but the rule is there nevertheless and it has been decided by the courts of our State as well as the courts of the United States that the Erie Canal is a navigable stream.

Mr. POWELL. That is by act of legislature, is it not?

Mr. VAN KENNEN. No. The rule is governed more by capacity—by purpose. As one authority has stated, in England all the inland rivers were short.

Mr. MIGNAULT. If it is a stream at all, it is a navigable stream?

Mr. VAN KENNEN. I do not want to go that far, but I will say this, that our now pretty well accepted definition of the word "navigability" is a stream which will carry to market any of the useful products of our country.

Mr. MIGNAULT. Even logs?

Mr. VAN KENNEN. Yes; I want to go that far, but I would hate to predicate that fact so strong as to say that that was my opinion as a lawyer. I do not say that it is changing. But the point that I want to make is this, that in 1808 and in 1826 those changes had not taken place; they became subsequent changes by the various decisions of the courts gradually extending that rule little by little until they have almost got to the point where, as Commissioner Mignault suggests, when you can carry a log it is navigable. And in order to avoid a very great inconsistency in our law they are trying to make a distinction between navigability in fact and navigability in law. The point that I want to put clearly before the commission is this, that undoubtedly when the act of 1808 was passed the interpretation placed upon the navigability of streams would have given to these applicants the title to the bed of that stream above the dam. Now, I think I have gone as far as necessary on that point.

Mr. JAMES WHITE. Was not the Erie Canal opened in 1826?

Mr. VAN KENNEN. Yes; I think it was approximately at that time.

Mr. JAMES WHITE. And at the same time there was a lot of canal legislation and canal building. Would it not be a fair inference to say that at that time navigability meant that the stream was navigable by canal boats?

Mr. VAN KENNEN. No; the decision came along after that. It was a United States court decision; it grew out of the fact that some fellow ran into another and it was a question of jurisdiction between the State and the Federal Government.

Mr. POWELL. Not to interrupt you—this is in your favor; it is not against you—speaking of this doctrine, about the presumption of it extending to the center of the stream in these large rivers, the New York court says, "Subsequently this doctrine was entirely repudiated in New York," the authority being given as 92 New York, 463; or 45 American Reporter.

Mr. VAN KENNEN. It agrees with my general point of view, does it not?

Mr. POWELL. Yes.

Mr. VAN KENNEN. I want to say to the members of this commission that I am endeavoring to state as clearly as I can the actual law of the State of New York and the history of that law as far as I know it. I am not trying to color it in any way in our favor, but I believe, and I tell you, that that is my understanding of it.

Mr. POWELL. Let us boil it down. Your argument is this, that at the time Ogden got this grant the law of New York was that it carried to the center of the stream?

Mr. VAN KENNEN. Yes, sir.

Mr. POWELL. That any subsequent change made by the legislature could not alter that law?

Mr. VAN KENNEN. That is my point.

Mr. POWELL. Are you prepared to go further and say that the Legislature of the State of New York, if New York had divested itself of their property in the bed of that stream, is powerless under your decision to take it away except by condemnation?

Mr. VAN KENNEN. That is what I am coming to.

Mr. POWELL. Then, we are a unit on that.

Mr. VAN KENNEN. Now, assuming that I am approximately correct and that by the grant of the riparian lands and by the rights as a riparian owner they became entitled to the bed of this stream and supplemented that by the grants that in the State of New York are the only powers that give water-power rights, namely, canalization of streams—I know of no other way in our State by which they get water-power rights, except by canalization, which comes through the theory that the State of New York has some control over the navigability of these streams, and in order to protect the navigability against the riparian owner who owns the bed of a stream and puts across a dam there they reserve the right to require the locks for the protection of navigation—that is a fundamental principle upon which are based all legislation and all decisions of the State of New York pertaining to the water-power rights of a man who projects a dam across a stream. In other words, there is absolutely no general dam act in our State, so far as I know. I should be very

glad to find one, but I never in my research have been able to find a so-called general dam act in the State of New York.

Mr. MIGNAULT. I have a reference here to an opinion by Mr. Justice Collins in 202 New York, page 18, and to Mr. Justice Grey's opinion in 200 New York, page 414. Unfortunately, I have not the reference to the name of the case.

Mr. VAN KENNEN. That is the Long Sault development case.

Mr. MIGNAULT. It was as to whether the riparian title in the State of New York goes to the thread of the stream in a boundary river.

Mr. VAN KENNEN. I shall very gladly explain what I understand that to be. That is the famous Long Sault case, as I understand it. Let me tell you the point of that case.

Mr. MIGNAULT. I know what the point was.

Mr. POWELL. That case does not apply here, because, so far as this channel is concerned, it is not international.

Mr. VAN KENNEN. I want to go further than that.

Mr. POWELL. That distinguishes the two cases. The United States are drawing distinctions in some cases between international streams and national streams. This is intranational, because it is between an island and the American shore.

Mr. MIGNAULT. That is a very debatable question. Here is an island in a river which is an international boundary river and the international boundary goes north of the island. Is the water south of the island not in an international river?

Mr. POWELL. No; it is not.

Mr. VAN KENNEN. I am very willing to accept Commissioner Powell's interpretation, but I want to say to you in connection with the Long Sault case that this is the fact: The question up before the court at that time was not this question as to who owned the bed of the stream, and that court did not decide that. It was obiter so far as the decision was concerned.

Mr. MIGNAULT. There is a good deal in what you say, but still it may be entitled to some weight.

Mr. VAN KENNEN. I believe that under the law as it stands to-day in the State of New York it must be admitted that the bed of the stream in this international water is in the State. I do no want to beg that question at all. But I say that case did not decide it, although it referred to it and established it as a principle. But there are one or two other cases that have decided the particular question. It arose not in the St. Lawrence River, but in the Niagara River, and it related to the right to excavate from the bottom of the river the sand for manufacturing purposes. The question arose pretty sharply, and was, I say, perhaps unfortunate for us, but at any rate this is true, that the Long Sault case, even if you take it as a precedent here, does not apply to our case; not only for the reason that has been suggested by Commissioner Powell, but for the further reason that there is every evidence that at the time when these questions came up it was regarded as a nonnavigable stretch of the stream, and this is all predicated upon navigability. Consequently, nobody ever suggested that the South Sault was not navigable. But here is a sure suggestion that that little reef crossing there was not navigable. So that the rule might be entirely different. Although they might find, if they were passing upon it directly, that the bed of the stream to

the Long Sault belonged to the State, they would not necessarily find, when applied to our case, that it belonged to the State when it passes over that reef.

If I am correct in regard to this matter, then I claim that we are entitled to the natural flow of that stream as a matter of right. And I want to say that it is a vested right, and I want to say that we can not be deprived of it in any way. We may be regulated out of it—it is barely possible that we can never enjoy the full benefits of it—by some process of elimination or regulation; but we certainly can not be deprived of that right unless we are compensated for it. That is a right and under our Constitution it is a sacred right, and nobody can take it away from us. I am talking now about the natural right that we have, being to the natural flow of that stream.

Mr. MIGNAULT. Are you claiming that you have any right to ownership in the flowing water, or merely a right to use it as it passes over your property, assuming that you own the bed of the stream?

Mr. VAN KENNEN. That is all I claim. In our country we do not speak of owning water.

Mr. MIGNAULT. Would not the consequence be if the flow of the stream diminishes you must take the water as it comes to you, and you have no vested right because the water in previous years flowed in greater abundance over your land than it does to-day?

Mr. VAN KENNEN. In one respect you may be right, if this were all natural, but I assert as a positive fact that no man, nor no country, by any authority could divert the water from beyond our intake without paying us.

Mr. TAWNEY. Mr. Van Kennen, do you mean that your right is superior or is subject to the right of navigation?

Mr. VAN KENNEN. I do not claim that it is superior to navigation.

Mr. TAWNEY. It is subject to the right of navigation?

Mr. VAN KENNEN. It is subject to it.

Mr. TAWNEY. You were speaking about the absoluteness of your right to the natural flow.

Mr. VAN KENNEN. I think you are absolutely right from our point of view. I was not arguing from quite that point of view. Navigation is superior to any other. But, however, I want to say from my standpoint we are entitled to the natural flow of that stream. The question comes up as to what that is. We might all differ in regard to that matter. I can very readily see that we have differed. Without very much investigation some of them have said it is much less than we claim for it. Without any very definite knowledge of where they got their information, they have here stated that the natural flow of the Little River, by authority of our War Department and its officers, who have evidently made an investigation and have reported in regard to the matter, is 26,000 cubic feet. Now, I want to make this statement with respect to that matter: That if that was taken upon what I would call the mean flow of the stream it does not differ materially from ours, because I want to say that as a thumb rule for the application of this you can say that our report and investigation, made as carefully as we know how to make them, showed that the natural flow of that stream is approximately one-tenth of the full flow of the St. Lawrence River. I do not claim that this is accurate absolutely, but it is accurate enough for the purposes of our investi-

gation and reasoning. So, when they say that the main stream discharges 195,000 cubic feet per second, you can figure approximately one-tenth of that goes down the Little River.

When they speak of 220,000 c. f. s., which they claim is the critical point so far as navigation is concerned, our idea is approximately 22,000 c. f. s. going down the Little River. I am not going to read all this, but I say that we have introduced in evidence plate No. 2, which from our figures shows about that. They are very easy to understand; they are within limits that will be safe for us to reason upon in all of these matters.

The State of New York has said, it seems to me, that we ought to know more about it. One witness, I have forgotten whether it was Mr. Stewart or someone else, said in substance that the variation might be 1,500 c. f. s. or 2,000 c. f. s. and another witness said approximately 10 per cent. I am speaking now of the variations of the natural flow of the Little River from the point of view of the various people who have offered testimony here, and I will assume in my argument that probably a variation of say 10 per cent might exist. I want to emphasize this a little, because it might have a bearing upon the determination of this commission, and I think it should have a great bearing, according to my way of thinking, and in view of the fact that the State of New York, undoubtedly feeling that it is entitled to some knowledge in regard to the matter, wants to make an investigation.

Now, we can all see that if I am correct in my view and if we are entitled to the natural flow of the stream, we ought to know how much that is, and, of course, that introduces a personal factor always, and somebody has got to say how deep was that water at a particular stage; and if you go down below the surface of the natural stream, or did you go down to it, or did you include this as unnatural and that as unnatural. Of course, I can conceive that these elements might come in, but at the same time I think we have yet to hear where there has been a single suggestion that amounts to more than approximately a variation of 10 per cent, which might be the variation within the limits of human error, because it is a little difficult to define it. Let us take that for the sake of argument and to amplify my argument a little more. The River St. Lawrence is a big river; it is a powerful river; it is icebound for a large portion of the year. I have personally known of its carrying bowlders as big as that desk there for miles in its ice. They say, maybe it does not get into the Little River, but favorable winds might probably have put it in there. Besides that, at the entrance the current is swifter and consequently the ice is shallower; as you go farther down in the stream you find the ice thicker in winter, and the first ice would flow out and the other ice would follow down. Evidence has been offered that that has been done. In the olden times, when we were using these plants very much more than now, there was undoubtedly almost the full current going down through there. Well, in a hundred years a great many things may take place, and therefore when you come down to the point of some fellow saying that that particular rock that stands there in that channel was there by nature before the Indians trod the shores, or was put in there since 1808, I do not know how in the world you are going to tell. But I think it

is safe to say they did not grow there like potatoes; someway they got there. That is the point I am trying to make upon that.

Now, if I am correct upon that, I say that we not only have the right to the natural flow of the stream, but we have the right to keep the stream swept. I have not yet heard it disputed from any source that if I have the right to the natural flow of the stream above to the mill dam I certainly have the right to remove a sunken log without asking anybody's permission. If that were not so there would not be a water-power proposition, so far as lumbering operations are concerned, worth a continental to-day, because in the modern methods of operating these projects you and I know perfectly well that they are now handling logs in the shape of pulp wood, and so forth, of such small dimensions that the specific gravity is practically nil, and that thousands and thousands of these logs are precipitated to the bottom of their ponds, and if we can not take them out as a right that we have incidental to our water-power right, then I can assure you that the water-power game in this country is up, so far as that is concerned.

Now, then, in addition to that, we have embankments and impediments here that have been put into this stream. There is one long bridge across the entire stretch with two openings, as I remember, for the discharge of water, that has been put in there within recent years. These are artificial obstructions. We have the right under the evidence that has been introduced, and under the deeds which have been given in evidence, to remove that at any time we see fit by replacing and giving the owners the right to go over by some other way.

Mr. MIGNAULT. Will you mention, for my information, the deed which gives you the right to remove the bridge.

Mr. VAN KENNEN. I can not put my finger on it at the moment.

Mr. MIGNAULT. You have it in the record?

Mr. VAN KENNEN. Yes; and if I have not put in that specific deed, because it has not been necessary to put in all the deeds, I will see that you get the deed upon that point. Now, I say that we ought to have the right, and we claim we have the legal right, to sweep that stream.

Mr. MIGNAULT. I would not think of disputing the right of a mill owner to remove obstructions that have fallen into his mill pond. I think that is an incident of his right. The whole question here is, What was the condition of that river at the time when your grants were made?

Mr. VAN KENNEN. Undoubtedly; and I will admit that there would be possibly some difficulty now in determining that. I am forced to admit that from the very nature of the thing. I do not want any more than we are entitled to, either, so far as that is concerned, and I am not claiming any more than we are entitled to. We think we have done it the best we can, and we have given a tabulated statement of what it is, and it gives us approximately one-tenth of the flow of the stream as a matter of right.

Now, gentlemen, we come to another point. Assuming that we are correct so far in our argument and that we have the right to remove the natural obstruction in this water, we have gone further than that; we have asked more than that. We have asked the right to excavate

the bottom of that stream for the purpose of allowing us to use the natural flow of that stream at the highest degree of efficiency. Another way of expressing that would be to say that we are asking to be permitted to do a thing which in its nature is the highest type of conservation. In other words, we are not asking for one bit more, in this line of my argument, than we are entitled to. But we ask the right to use what we are entitled to, so that the water will approach our dam, at a speed, so to speak, at a rate, so to speak, as will maintain our head. And in order to do that we must make some excavation.

I do not want any confusion about that point of view. It is perhaps a technical engineering proposition, but it is certainly one that I believe, if it is called a privilege, then I think it is a privilege which ought to be accorded to us, in order to develop these resources which we have to the highest degree of efficiency.

Mr. SPRATT. We do not ask for any more water.

Mr. MCLEAN. I do not quite understand the point. Is it this: That in addition to what the natural state of the stream was, you ask the right to excavate through material from the bed of that stream?

Mr. VAN KENNEN. Yes, sir. I think that is correct, and I do so for this purpose, you understand, of permitting us to use what we are entitled to; that is the natural flow and no more.

Mr. MCLEAN. I get it.

Mr. VAN KENNEN. At the highest degree of effciency.

Mr. MCLEAN. Yes, I understand.

Mr. VAN KENNEN. Now, gentlemen, I will not spend any time elaborating on this. I will merely illustrate this with one thing with which you are perfectly familiar, and that is the Niagara situation. That development on the American side is probably the most wasteful development of water power that has ever been known, according to the views of many engineers. It develops at a head of approximately one-third, and I do not know but what I may be in error in putting it as high as that. But the point I want to make is that the development upon the American side of Niagara Falls is wasteful development for the reason that they do not use the head that they could get, and consequently the power that is produced is very greatly limited. The Canadian Government is much wiser in its method of development, if I understand it aright. It is now projecting a development which will enable the discharge of the waters to which they are entitled over an escapement at Chippewa where the height will be, how much more, Mr. White?

Mr. ARTHUR WHITE. 305 feet.

Mr. VAN KENNEN. As against 160 feet on the American side. Am I approximately correct?

Mr. ARTHUR WHITE. That is substantially correct.

Mr. VAN KENNEN. So that you can see that if they were developed on the American side to the same degree of efficiency as on the Canadian side, they would produce twice as much power, approximately, as they are producing to-day. And the day will come, and it is not far distant, when the powers at Niagara Falls on the American side will be scrapped and when they will develop it on a much higher degree of efficiency, according to my views.

Now, what I say here is this: I want the right—and if it is a privilege, I will say so; to that extent I am willing to ask for that privi-

lege. I want that we be permitted to so deal with the bottom of that stream that we can use the water-power rights to which we are entitled, to the highest degree of efficiency, and that is all.

Now, I come olong to the next proposition, and that is this: What is the present condition there? I do not want to find fault with anybody, but I want to say of Mr. Stewart, as the boys say when they get into a ball game, and when the umpire is giving them the worst of it in the pinches. He has taken, for instance, the condition in his figures at what he understands that to be at that time with respect to the diversion of the water in the Little River, namely, 2,000 c. f. s., as he says. He bases all his figures on 2,000 c. f. s. diversion in the Little River. I want him to correct me in that if I am not right. Why he took 2,000 c. f. s and not 3,000 c. f. s. or 5,000 c. f. s., only appears when he states that he understood that that was about what was being diverted there at that time. He may be approximately right, but let us see what the situation is. I have tried to show that we are entitled on the Little River to the natural flow, which is 10 per cent of the whole river. For many, many years, since 1808, we diverted probably approximately the full natural flow. One mill after the other was destroyed or burned down——

Mr. TAWNEY. What do you mean by saying you diverted the natural flow?

Mr. VAN KENNEN. I say that we took the natural flow down through the river.

Mr. TAWNEY. You mean you utilized the natural flow.

Mr. VAN KENNEN. That would be a better expression. We utilized what we were entitled to. I meant diversion from the main stream and put it down there.

Mr. TAWNEY. That is the natural diversion.

Mr. VAN KENNEN. Yes; I do not mean physical diversion; your criticism is absolutely correct.

Mr. TAWNEY. I do not want to get matters confused.

Mr. VAN KENNEN. I say that for many, many years, and up to what date and as to what quantities the evidence shows, that for many, many years there was utilized on the Little River approximately, I should say, the natural flow of that stream. At any rate, there were mills from one end of that stream to the other across the entire section. There was a power canal constructed which went downstream for a long distance, and on it there were mills and factories innumerable. Let us picture the situation when that was there and when the water was being used out of the Little River to run all these wheels. Well, Mr. Stewart says, "Now, Mr. Van Kennen, that is all right; it is possibly true, but you allowed that mill to burn down and that wheel to be shut off, and you did not rebuild it. You allowed the gristmill at the south end to be closed because they could mill grain out in Minnesota cheaper than they can do in your country; you allowed that shingle mill to go into disuse because the forests of northern New York have been denuded of their timber; you allowed that lumber mill over on the other corner to be taken out, because similar conditions existed with respect to that. The immense paper mill which ran there up until very recent years

you allowed to go into disuse, for the reason that instead of making paper out of rags as they did they now make it out of pulp wood at a cheaper rate, and consequently it went out of business." And he says, "Because you have destroyed these and therefore increased the head at Lock 24, you should not be allowed to reclaim what you have been entitled to since 1808, and this commission should say that they must maintain the status quo of that situation."

Now, I think that is a fair presentation of the argument made by Mr. Stewart. If I have overdrawn I apologize because I have no intention of doing so. At least, that is as I understand the contentions put up from the Canadian side. I say that that is giving us the worst of it in the pinches. I believe that we ought at least to be entitled to what nature has given us and I say we are entitled to it without question.

Let us see what has happened. The critical points of navigation—and I am perfectly willing to say that navigation interests should be protected, and that the Federal jurisdiction is paramount in that respect—I want to say so far as that is concerned that the parties who agreed to this treaty and created this commission recognized existing conditions. It did not propose to deprive the people at Niagara Falls of the water they were using at the time the treaty was made. It gave to Canada 36,000 c. f. s., it gave to the United States 20,000 c. f. s., and for what? For business interests that had been established in these two countries, with some slight limitations. I have always thought of course that Canada got a little the best of the bargain when they got 36,000 c. f. s. to our 20,000 c. f. s., but I have not any reason to complain about that at all, because I think that before this commission gets its entire jurisdiction worked out it will have equalized anything of that kind. There may have been a good reason that I do not see, but I never could quite understand how it was that we got 20,000 c. f. s. and you got 36,000 c. f. s.

Mr. KEEFER. To equalize the Chicago drainage perhaps.

Mr. VAN KENNEN. That was only 6,000.

Mr. KOONCE. If the commission is interested, I can tell why.

Mr. VAN KENNEN. I was never able to find out.

Mr. POWELL. That is not material here.

Mr. MIGNAULT. That is several hundred miles away from your place and you can leave it.

Mr. VAN KENNEN. I would be very glad to find out sometime.

Mr. TAWNEY. Judge Koonce will tell you down at the hotel if you are so anxious about it.

Mr. KOONCE. I can say now that it has no reference to the Chicago drainage.

Mr. VAN KENNEN. The point I want to discuss is this: That when the engineers came to us from one side and say that because our business has been established there and because we have allowed some of the wheels to become disused we ought not now have the right to put them in use again.

Mr. POWELL. I did not understand that argument to be made. Who made that contention?

Mr. VAN KENNEN. That is the logical result of the argument made on the other side.

Mr. POWELL. You are pushing that argument to an absurdity.

Mr. VAN KENNEN. No, sir; I am not. Mr. Stewart said that if we were allowed to divert 30,000 c. f. s. by way of the Little River that that would be in substance asking for a diversion of 28,000 c. f. s. more than we are diverting now, or that is going through there at the present time. Then he says, based upon that figure, that that will lower the water at Lock 24 by 2 feet. That is his statement. Now I say that if we are entitled to divert the natural flow and that was based upon the critical point, 222,000 c. f. s., or as he puts it, 190,000 c. f. s., we then, instead of diverting 28,000 c. f. s. additional, at 222,000 c. f. s. we would only be diverting 8,000 c. f. s. at the worst, and at 190,000 c. f. s. we would only be diverting 11,000. These are approximately correct. If we are entitled, as a matter of right to take out of there at the low stage of the stream 190,000 c. f. s., if we are allowed as a right to take out approximately 10 per cent in that low stage, then it is not quite fair for us to be confronted with the proposition that we are taking out 28,000 c. f. s., and therefore lowering it on the other side, as he says, 2 feet. Because if we had our mills in operation and taking out what they required, the diversion would be only 11,000 or 12,000 c. f. s. and then the fall on Lock 24 instead of being 2 feet would only be 1 foot. I am not giving the actual figures, but they are approximate figures.

The next point that I want to make is this: What is our plan? Our plan has been this: We have asked this commision for its approval of a plan to construct a dam at A or B. It has been suggested, and probably correctly suggested, by Commissioner Mignault that an alternative proposition probably would not be entertained by the commission, but there may be some way of getting around that. But at any rate, the reason for that is that at A we would have a little more economical development, as I understand it, from the engineers. At B we would have more excavation for a tailrace to be made. I suppose we might ask at this time to have it amended, or it is possible that the commission might say at any point between A and B.

Mr. POWELL. Is A above the point mentioned in the statute of New York or below it?

Mr. VAN KENNEN. It is above; it is upstream. We own the land at A by the grant of 1826.

Mr. TAWNEY. You are the riparian owner at either location, as I understand it, except the overflowing of certain lots?

Mr. VAN KENNEN. Yes; which we have under our control and which we could undoubtedly acquire to-morrow.

Mr. TAWNEY. How about the abutments of the dam?

Mr. VAN KENNEN. We own those.

Mr. TAWNEY The dam would abut on your own property?

Mr. VAN KENNEN. Yes, sir. At any rate, what we have asked is that. Now, why have we asked that? We have in contemplation the development of power for electrical purposes, which is a new invention so far as the age goes. Until very recently a proposition of that kind would have been of no great use, and when I say recently I say within the period of our lifetime. You could not transmit it anywhere. You could not use it except at the point of production. But now we can send that to Montreal, to New York,

or to any of the centers of activity, and do it upon an economical and feasibly commercial operation. So that it becomes a purpose for the development of power which we want to do at that place. We have asked for 30,000 cubic feet. We do not require any additional water at certain stages of the stream, but at lower stages of the stream we shall have additional water beyond what we claim as our right. Even if we had that alone we would have a mean development there which would amount to 26,000 or 27,000 horsepower, but, as the engineer has well explained, if we could have a continuous flow of 30,000 that would give us approximately 28,000 or 29,000 horsepower at that point. He says he is perfectly willing to have this commission regulate it so that if it is adversely affected it might be cut down. Mr. Stewart gave 190,000 cubic feet as the flow, and there is no record, that I know of, of the flow of this stream revised up to date which shows that it ever got down to that low stage. There is a record, however, at 194,000 which was a monthly mean, but which, he says, may have possibly gotten down to 190,000 in a single day in 60 years. So we are not afraid of that. It is a well known fact among engineers and business men that a development which will maintain its normal efficiency for 75 or 80 per cent of the time is well worth the development. And when we get up to one month from 1860 to the present time at that low stage where it might have to be regulated somewhat, none of us is going to live to see the day when it will have to be regulated. But if you do want to regulate it, we have no objection whatever. Not only have we no objection to your regulation of that matter, which I think is fully within the province of this commission and has been done, as I understand it, by this commission in other instances, but we have no objection whatever to supervision with respect to construction.

Mr. POWELL. Have you any statute of limitations against the State in respect to the ownership of land in New York?

Mr. VAN KENNEN. The best that I could say is that there is no statute of the State but there is a general statute with respect to the rights which might be acquired by use, if that is what you have in mind.

Mr. POWELL. That is, the State can not lose its ownership of land by adverse uses?

Mr. VAN KENNEN. No; there is no such law as that.

Mr. POWELL. Not even the law of presumed grant?

Mr. VAN KENNEN. The statute, as I understand it, of what we call prescriptive rights acquired, which is based upon a presumption of grant, applies against the State the same as it does against an individual.

Mr. POWELL. Is that limited to easements, or does it extend to the fee as well?

Mr. VAN KENNEN. To the fee as well.

Mr. POWELL. Do you agree to that, Mr. McLean?

Mr. MCLEAN. Except as to terms and some modifications as to how the rights may rise.

Mr. VAN KENNEN. Now, I am going to pass that and come to the next point. Of course, our dam at present and our mills have gone down until now there are only five or six upon this whole water

power that are in use. We are a public service corporation, authorized by the State of New York to carry on a public service business and to acquire property for that purpose. We have done so. In a very small way, comparatively, we are now operating on that dam a public service business of lighting the streets of Waddington and its buildings. At any rate, while it may be small, it is respectable and I think it maintains all the rights which we are entitled to.

But, passing beyond that, our dam is out of repair, so sadly out of repair, that it must be renewed or repaired in some form. Therefore, we have come to this commission asking the right to reconstruct and repair, or in the alternative, as I said, build this dam at point A. The moment we do that and utilize this water we know that it must have some effect upon the levels. Consequently, that brought it directly within the jurisdiction of this commission. Although we were in existence before the commission, it nevertheless affects the level of the stream, and we are here. It is unfortunate for us, gentlemen, that there is not some tribunal to which we can appeal from which we can get final determination. We will get final determination here, to be sure, but, unfortunately, the Secretary of War comes in, and I assume we shall have to talk with him; then, we have been obliged to go to the Secretary of State to get the right to transmit a part of this electricity, which, by the way, the public service commission of the State of New York has granted us the right to do, into the Dominion of Canada. One-half of all the electrical energy which we can produce up to 34,000 horsepower, if I remember the figures correctly, have been authorized to be transmitted into Canada; the other half the public service commission of the State of New York has required to be held for the use and benefit of the commercial industries of our own country.

I say that in order to do that we had to go through the Secretary of State's office. When it comes down to the Dominion of Canada we have not yet quite reached the end of our applications, that is to say, I assume that the minister of public works will have to be consulted. But we had to begin somewhere. We probably have got to go to the State of New York with respect to that dam, at least.

Mr. MIGNAULT. Mr. Van Kennen, I stated at the beginning of the hearing that I was afraid that you had begun somewhat at the wrong end. Assuming that the Dominion of Canada will not allow you to construct the weir and the embankment on Canadian territory, what then?

Mr. VAN KENNEN. I do not know just how far your jurisdiction with respect to that goes, and that was the point I was coming to.

Mr. MIGNAULT. I want you to address to us any argument you can. I am not expressing any opinion, but I am looking at it from the point of view of this difficulty, assuming we grant you all you ask, and you can not obtain from the Dominion of Canada or from the United States the authority required under Article III of the treaty to construct this obstruction or embankment, or what has been called the submerged weir, of what use will be the approval which we have granted? That is a point I would like you to consider, and I had hoped that after the hearing at Atlantic City, where I called your attention to this point, you would have gone to Ottawa and

to Washington and attempted to regularize your position. I put the whole question before you because I want to hear what you have to say.

Mr. VAN KENNEN. I will answer one branch of it at a time. For instance, we went to the Secretary of War first. We had to go to some place first. And I do not think I am traveling outside of any confidence when I say that the Secretary of War said, "Now, the International Joint Commission is the commission that has jurisdiction over the question of these levels. You should go before them first, and if they approve of your project, then"—I will not say that they stated to us that they would approve it, because I think I ought not to state that and I do not know anything about that, but, at any rate, they said that they would like to have first the views of this commission, that they had adopted that as a course of procedure.

Mr. MIGNAULT. I do not think that is exactly in accordance with the precedents of the commission.

Mr. KOONCE. Will you allow me to explain that?

Mr. MIGNAULT. Yes; I would like to hear what you have to say, Mr. Koonce.

Mr. KOONCE. The New York & Ontario Power Co. made application to the War Department in the usual way for approval of its plans for these works. We investigated the project to the extent of determining its effect on navigation, which is the main thing that comes under the jurisdiction of the department, and we came to the conclusion that it had no objectional features so far as navigation in American waters was concerned. I will speak about this from the 1916 application, which was the first application made by this company. At that time they simply contemplated the use of the natural flow; they did not have this scheme of embankment, etc., in Canadian territory. That is where we came to the conclusion that there were about 25,000 or 26,000 second-feet of water as the natural flow of that river; that the rebuilding of this dam and its reconstruction on the plans that they proposed would not affect injuriously navigation in our territory; and if we had been in a position to do so we would have approved the plans and transmitted them to you in the regular way. As I said before, our records showed that four or five years preceding the Government of Canada had made very strong representations against any further use or diversion of water through this little channel, and had represented to us that they were very much opposed to it. They would not entertain the proposition in any respect. But at the time this application of 1916 was made we had before us an order in council of the Government of Canada in which they had withdrawn their objection to the extent of saying that they were willing to have it considered by the International Joint Commission. That is on our records, and I suppose Mr. Keefer has knowledge of that. I think it was passed sometime in 1915 or 1916.

We, as you know if you are acquainted with the history of the United States for the past 8 or 10 years, have not enacted any water-power legislation. Congress has not passed a water-power bill. The War Department has not approved any power development plans. We have been trying to get Congress to pass what we call a general

power bill. I have a copy of the one which is now pending. The two Houses of Congress have been at loggerheads on it. One has a theory that this water-power is a national asset and that the Government should charge a royalty for its use. The Senate takes the view that it is a State matter and a matter of riparian rights and that the simple assent on the part of the Federal Government is all that is necessary. Between those two we have never got any legislation. During the past year the heads of three of our important departments, the War Department, the Interior Department, and the Agricultural Department have caused a general power bill to be drafted which has been transmitted to Congress through the President. It has passed the House of Representatives and is now pending in the Senate. At the time the application of this company came up this legislation was in contemplation and as had been our policy for the past 8 or 10 years, we declined to act affirmatively on any water-power proposition until Congress has enacted this what we consider necessary legislation. That is the reason we did not act affirmatively on these plans. We simply said to the Secretary of War in returning the plans to him that while we had no objection to them from the navigation standpoint, we recognized the fact that they affected Canadian interests and it was a matter that should come before the International Joint Commission and that we had no objection to their being referred to the commission for consideration in advance of final consideration by us. Now, the effect of that would be just as it was in the St. Croix River case. You will consider this application and approve it or disapprove it as you see fit. Then when this legislation is enacted this company will come before the Secretary of War of the United States or this commission, if it is in existence at that time, and secure the necessary approval. I assume that they will take the same course over here on this side before the proper Ministers of Canada to secure the approval of the Canadian Government. I do not myself see any reason why the commission should not act on these plans and complete its consideration of this proposition in advance of action by the two Governments. It may be that they will never get any permit from our Government.

Mr. MIGNAULT. That is the point.

Mr. KOONCE. But this is one of the steps in that direction. It is one of the steps that has to be taken and your investigation is one of the most valuable ones because you bring out the fact that will be of infinite use, not only to our Government but to the Government of Canada in dealing with this matter; facts which neither of our Governments would be able to elicit. In that way I think your advanced consideration of it is much to be preferred.

Mr. MIGNAULT. So far as any action of your Government is concerned any decision which we may render would be purely advisory.

Mr. KOONCE. Yes; we would be governed by your decision undoubtedly.

Mr. TAWNEY. I do not think, Mr. Mignault, that that is a correct inference, that our final judgment here would be advisory. I think what Mr. Koonce means is that in this matter involving the rights and interests in both countries which must be adjudicated by this commission under the treaty, the fact which the record of this

meeting will disclose to the two Governments will enable them to get a better view of the whole situation to determine whether or not, independent of the act of the commission, the proposed obstruction, use, and diversion of these waters should be authorized by the Governments themselves. That, I take it, would be the chief value to the Governments, because with the aid of this reference both Governments will have in their possession the information concerning the rights and interests of both countries that they otherwise could not have had if they had had ex parte hearing on the proposition.

Mr. KOONCE. It is infinitely to be preferred to have this investigation by the commission in advance, particularly as there will probably be opposition on both sides in some form or other to the granting of this application. It may be that neither Government will ever grant it, but that does not preclude you from doing what the treaty imposes upon you in respect to it.

Mr. TAWNEY. And what one of the Governments has asked us to do.

Mr. MIGNAULT. Has the Government of the United States asked us to do it, or has it merely said that it saw no objection to our doing it?

Mr. KOONCE. Your department said that it saw no objection, but the transmittal to you by the State Department it seems to me is a request.

Mr. KEEFER. It is a request for a hearing, as I understand it.

Mr. KOONCE. Nothing else, of course.

Mr. POWELL. As I understand it, there are two separate elements necessary to constitute legality. One is the approval of this commission and the other is the approval of the United States. One is not subsidiary to the other. They are entirely independent. They could have gone there instead of coming to us. They could have gone to the United States first and got one and come to us to get the other. In fact, the United States sent a very curt note to us at one time for not having had them in the first instance approve of it before we undertook to approve of it, inasmuch as we had laid down a rule to that effect.

Mr. KOONCE. Was not that a case that did not arise under Article III?

Mr. POWELL. No; it was under Article III. It was the St. Croix case.

Mr. KOONCE. But you have a precedent for this.

Mr. TAWNEY. I am very glad to get the statement of Mr. Koonce for the information of the commission and also for the record.

Mr. VAN KENNEN. In respect to that, gentlemen, I was just about to say that it really is unfortunate that in an enterprise of this kind we can not find some central body to which we may appeal and get a final determination.

Mr. TAWNEY. Is not that natural in view of the two territorial jurisdictions within which your project extends? Under the treaty the jurisdiction of this commission extends to both sides. But when you propose an obstruction on one side or on both sides in connection with any given project it necessarily follows that the Government within whose jurisdiction the obstruction is to be erected should authorize that obstruction, subject, however, to the approval of this commission that represents both countries.

Mr. VAN KENNEN. I can very readily understand that, but the point I want to make is that I wish this commission when it decided this had full jurisdiction to decide for everybody.

Mr. MAGRATH. That can only be accomplished in one way, by Canada taking in the State of New York.

Mr. VAN KENNEN. I do not think this is so serious as that, but I think there ought to be a tribunal and that this commission ought to be the tribunal.

Mr. POWELL. It is just possible when you look at this thing logically that this commission has the power. Taking as the major project, the chief object in view, the diversion of this water, then might not these very things follow as remedial measures and as such we have the right to impose them? I simply suggest that; I do not give it as an opinion.

Mr. VAN KENNEN. I wish your point of view were correct, because I am before this commission now and have presented all the facts and made the best case I can, and I am willing to abide by the determination of this commission; but I do not want to be put in the position where I have to go and ask somebody else.

As soon as the application for the reconstruction of our dam that has been there since 1808 was made, of course, there was some question about the effect upon the level at Lock No. 24, and we knew that as well as anybody else. Then there came to be naturally and properly, I will say, some objection, if you want to call it an objection—a protest, perhaps, would be better—on the part of the Dominion Government of Canada with respect to that matter. We then proceeded immediately to determine what could be done in the way of obviating the objection, so far as possible, at least, that was offered on account of the lowering of the water by taking what God Almighty gave us the right to take on the other side. Therefore, we called into conference our engineers, and, if I understand it correctly, they immediately began to collaborate with the engineers of the Dominion of Canada with respect to doing something to compensate for the lowering of the water at Lock 24 in the interests of navigation.

I had, I suppose, some right to think that the plan of our engineers met with approval, some approval, at least, from the engineers of the Dominion of Canada. That plan suggested that they put this embankment between Canada Island and Ogden Island; and also the proposed fill at the point E in our project. I was advised by our engineers that there would be a twofold effect of this proposed fill between Canada Island and Ogden Island and the weir, or whatever you might call it, at the head of or near the entrance to Lock 24. I was advised by them, and I still believe, and the evidence, I think, without going into all its details, shows that, so far as the elevation of water is concerned, the whole project, taking into account the passing through the Little River of 30,000 cubic feet for utilization at our dams, which we claim we are entitled to most of the time any way, and at lower stages of the water would require a certain amount of surplus water to be given and at a mean stage of 250,000 cubic feet for the main flow of the river amounts to only about 30,000 second-feet of additional water; that in view of the fact that we were putting in these compensatory works at this point, improving, as we be-

lieved, navigation, and as we have attempted to show also maintaining the level at this place, it is only just and fair that any compensation for that work that we have done and which we believe is beneficial for navigation, and which if you should ask me I should say that the Dominion Government or any other Government might well afford in the interests of navigation to do the same identical thing, that we should have this additional water. Now, that is all there is on that project. Our project being, then, this, according to my point of view: That the remedial works at D and at E will be some advantage to us in that the fill between Canada Island and Ogden Island will lower our tailrace somewhat, giving us approximately 1,000 horsepower or thereabouts; the fill at E will also raise the water at the entrance of the lock and would doubtless raise our head a certain amount, which would also be beneficial. Now, I for one can not see why that is not a fair proposition.

Mr. TAWNEY. You say the construction of the fill from the lower end of Ogden Island to Canada Island will give you an additional amount of horsepower to the extent of 1,000?

Mr. VAN KENNEN. Mr. Lea, that was about your statement, was it not?

Mr. LEA. If we get 30,000 cubic feet per second it would not be any more than 1,000. If we get less it will be less, of course.

Mr. VAN KENNEN. If we get the full 30,000 cubic feet per second with the lowering of our tailrace, we would get the benefit of about 1,000 horsepower?

Mr. LEA. Yes, sir.

Mr. TAWNEY. So you could operate your plant efficiently and economically even without this, could you not?

Mr. VAN KENNEN. We certainly could.

Mr. TAWNEY. The construction of this work is for the purpose merely of giving you an additional 1,000 horsepower?

Mr. VAN KENNEN. And also to compensate for raising the water there for navigation, to raise the water over the Hog's Back. The complaint was that by taking the 30,000 it was going to lower the water in the north channel.

Mr. TAWNEY. But your compensation above is for the water that you take in through the Little River, is it not?

Mr. VAN KENNEN. I think the commissioner is not quite clear upon that point.

Mr. TAWNEY. It is not full compensation, then, that you accomplish by the construction of the submerged weir?

Mr. VAN KENNEN. I want to get at it this way: The embankment between Ogden Island and Canada Island will raise the water all the way up the north channel, even as far up, as I understand the testimony, as the entrance to Lock No. 24.

Mr. TAWNEY. I did not know it went up that far. I misunderstood one of the witnesses, then, yesterday when he indicated that it would not go as far as that. I was under the impression from the testimony of one of the witnesses yesterday that the compensation on account of this construction from the lower end of Ogden Island to Canada Island did not extend as far up as Lock 24, and that the compensation accomplished by the construction of the weir was for the purpose of compensation for the inflow at Lock 24.

Mr. VAN KENNEN. I think the evidence is a little different from that; that it would do something. It serves there a dual capacity; first, improving navigation by raising the water in the north channel: and, second, by assisting us in lowering the tailrace. At E it raises the water at the entrance and also necessarily would raise the water at our intake. So that that serves a dual purpose. We can operate this project without these, of course. I have not any doubt of that at all, and Mr. Lea, the engineer, assures me that.

Now, let us see what the objections are. I have examined so far as I deem it necessary the objection of Mr. Stewart, representing the Dominion Government, except in one particular. In addition to what he says about the lowering of the water he comes to this: He says that there is in contemplation a larger scheme of development, namely, the regulation of Lake Ontario by the construction of a dam at Canada Island or vicinity, and that we ought not to allow the New York & Ontario Power Co. to use its natural right because it might possibly somehow, some time in the future, interfere with this greater development. That means, of course, that these men who have invested their $400,000 in a plant, which at present is useless, must await the final determination of the two Governments upon a project of that kind.

Mr. MIGNAULT. You are forced to wait the final determination of the two Governments before you can do anything?

Mr. VAN KENNEN. Surely, but not for the final determination of the canalization of the River St. Lawrence.

Mr. MIGNAULT. No; but until you get the consent of the two Governments to the construction of these works you can do nothing.

Mr. SPRATT. That is not the point made by Mr. Stewart.

Mr. MIGNAULT. I am not dealing with Mr. Stewart's objection.

Mr. VAN KENNEN. I am only taking up one objection with the other. I do not want to waste any time on the matter, but I really understood that that was Mr. Stewart's objection.

Mr. MIGNAULT. You see the trend of my mind?

Mr. VAN KENNEN. Yes; I know we have a long road yet before us. I am sorry that we have that long road. I wish you could decide it here to-day, but you can not. However, we have to get going somewhere. But he said that this ought to be denied, if I understand him correctly; that it should be held up until the two Governments by united action determine whether they will canalize the St. Lawrence or regulate the flow of Lake Ontario by the construction of a dam in that place. That means, as I say, that these people who have invested their money must hang on if they can until that time. I am in favor of Mr. Stewart's proposition personally, and I believe that our people are generally; I do not know, but I speak for myself. But what we are opposed to at this time is that we should be called upon to wait the slow movement of two Governments to unite upon a policy which might come to that. Why, they referred here to the fact that the Deep Waterways Commission had reported in favor of this project in 1900, I think.

Mr. TAWNEY. You are right, and you might add also that there was another commission that reported in 1872.

Mr. VAN KENNEN. And I think, Mr. Commissioner—I am predicating it upon memory, and I want to withdraw it if it is not cor-

rect—that since 1900 and within the last five years there has been a commission of Congress that reported against it. I do not say that that is true. They disapproved it on the ground that it was commercially unfeasible—a representative body of the United States Government.

Now, we have had a great many projects. God knows I hope they will do this, because it will benefit us by increasing our head, and I hope they will do it immediately. But we have had a great many governmental projects, as everybody knows. I suppose there is not anybody here who has forgoteen the fact that ever since we were boys they have been talking about the Georgian Bay Canal. They never have gotten it yet. I am only arguing this for the purpose of saying that I do not think we ought to be called upon to wait all this time with the interests and all other carrying charges on a property, even modest as it is of $400,000 to $500,000, and not give us an opportunity to develop it.

I now come to the next objection, which is introduced by the Dominion Marine Association. They say that it might interfere with navigation. Of course, we know that the project of putting the embankment between those two islands will increase the speed of the current. Mr. Stewart has given it as approximately 2 miles. I think that is a trifle less than our engineers gave it. We have demonstrated beyond all question that in other stretches of that north channel the current is swifter than it would be after we put in this embankment. But they still say that even though that is so, may be it would interfere with navigation, because these other swifter spots we have now ways of avoiding by going into slacker water and our boats will run up. Now, let us see. There is no evidence upon that point, but the reasonable assumption is that the current diverted by the embankment at this place bearing somewhat over toward the Canadian shore will certainly have two effects if we apply the rule of physics to it; namely, it will necessarily lengthen the slack water on the side of Canada Island and also along the Canadian shore. If it does that—and I will not say that it does, nor do I claim that the evidence shows that it does—but if it should do that, with the little increase in the current any boat that could navigate it now would certainly be able to navigate it then. Let us see what it all amounts to. The navigator brought here by this Dominion Marine Association says, "We would be able to navigate that except possibly with our slowest boat." He said the *Prince*, if I remember correctly; at any rate, "with our slowest boat." Now, there is no upstream traffic except the Richelieu boats.

Mr. KING. I do not think that is quite a proper interpretation of Capt. Batton's evidence.

Mr. VAN KENNEN. I do not intend to overstate it at all, but that is about it. But when all is said and done, there is no upstream navigation except very occasionally; once in a while a tug. As far as the testimony has gone, the upstream navigation of the tugs has not been noticeable; it is negligible. The upstream navigation, so far as other boats are concerned, is represented here by the Richelieu, or the Canadian Steamship Co.'s lines; that is, they are downstream river boats that they run daily. It is just barely possible that one of their boats, or maybe two of them, might have to lock at this place

instead of going up on the outside if we did this. But there is ample opportunity for that. I will not press that any further.

The State of New York comes in and, of course, they say that they have some interest here. Just how specific and how definite it is not very clear at this point. But, at any rate, judging from what has taken place, they claim that the State has some interests in what we might call the surplus waters. I do not think they dispute that we have the right to the natural flow of the stream, but if we wanted this extra 3,000 cubic feet at times or 2,000 cubic feet and even more at very low stages of the season, that they would have interest in that. And it is possible that they may say that they have some interest in the bed of the stream. I will leave that for them. But they come here and they will state their proposition.

We maintain, as I have argued, that we are entitled to the natural flow, and anything above that I do not think we are entitled to as a matter of right; it would be a matter of favor. Sometimes it is nothing, absolutely zero. At other times it amounts to something. At the mean natural flow of the stream, which I state to be 250,000 cubic feet per second, it would be approximately 2,500 cubic feet per second extra.

Mr. MIGNAULT. Through the Little River?

Mr. VAN KENNEN. Through the Little River. Now, I am concluding with this statement, and in view of much that has been said I do not want to overlook, nor do I want this commission to overlook, what we claim to be our natural right, namely, in substance, when that river discharges 250,000 cubic feet per second we are entitled to 25,000 as a matter of right. If you see fit to give us the other 5,000 as a matter of favor we want it. But when the people come and say that this commission is handing out favors to anyone we want to know the measure of those favors that they are handing out, if there are any, and we do not ask any that we do not think we have amply paid for. We do not ask any that we do not believe we have paid for by the benefits to navigation, which we have shown and proven here to be due to our proposed construction. But we do not want the people of Canada, nor the people of the United States, or anybody else to get the impression that this commission is granting to us as a matter of favor any 30,000 cubic feet of water. We claim that as a matter of right we are entitled to the natural flow, and we claim that if you give us up to the 30,000 that that is a very negligible quantity when you come to take it into full consideration.

The people ought to understand that instead of making assaults, as somebody has done in regard to this situation, it seems to me that the people ought to understand that we have certain rights that we are entitled to and not that we are here asking favors of this commission beyond what I have stated the facts to be. The coloring given to the public press would be entirely different when they come to understand that I stand here before this commission asking for this company a right to that amount and not as a favor. If there is any right beyond what we are entitled to as a matter of law, as I see it, I want the people to know what that is and why it is given. That is why I have been and am still so emphatic upon the question of our natural rights in this matter. I do not want anybody to go

away with the idea that I am asking for anything here that I am not entitled to, and I will not stand for it, because I am not and this company is not. All we want is what we have had since 1808 and before that time as we view it. We may be wrong, but I think we are entitled to it, and I resent any insinuation that anybody is giving us anything, and particularly that I am here asking them to give anything. I am not.

(The commission thereupon, at 1 o'clock p. m., took a recess until 2.30 o'clock p. m.)

AFTER RECESS.

ARGUMENT OF MR. MARSHALL McLEAN (FOR THE STATE OF NEW YORK).

Mr. McLEAN. Mr. Chairman and gentlemen of the Commission: In replying to Mr. Van Kennen, in order that I may follow the sequence of his argument, I shall, in the first instance, take up the question of the title, if any, acquired by the applicants under the statutes of 1808 and 1826. Before doing so, and in order that a proper point of view may be taken as to the meaning of these statutes—as a preliminary statement which I will follow up later on, the second point, with what I believe to be proper argument, I trust, and to sustain it—I must say that the St. Lawrence River was from the earliest time a navigable river and that the Little River is and has been from the earliest time an absolutely essential and component part of the St. Lawrence River. They constitute not two streams, but in their essence and in fact they are one river.

Mr. Van Kennen, in laying before you the statute of 1808, did not give it in full. I am going to ask your permission to place it before you in full, because I believe that only in that can you really appreciate its full effect.

Mr. POWELL. The exhibit gives the statute in full.

Mr. McLEAN. The exhibit gives the statute in full. I shall read the statute of 1808:

CHAP. 121.—An Act for opening and establishing a Lock Navigation on the river St. Lawrence in the town of Madrid.

[Became a law April 1st, 1808.]

"Whereas it has been represented to this Legislature by various Petitions from the inhabitants of the County of St. Lawrence, that by means of a certain dam lately erected and made by Joshua Waddington, David A. Ogden and Thomas L. Ogden, across a branch of the river St. Lawrence running between the town of Madrid, and a certain Island called "Isle au Rapid Plat," the water is made comparatively smooth both below and above it and that if boats could be transported over the said dam by means of a Lock or Locks, the navigation of the said river would not only be greatly improved, by avoiding a very impetuous current for several miles, but boats would be enabled to pass up the river under the American shore. Therefore:—

"*Be it enacted by the People of the State of New York represented in Senate and Assembly* That Joshua Waddington, David A. Ogden and Thomas L. Ogden, their heirs and assigns, shall have full right, power and authority to construct and make a canal in such manner and direction as they shall judge proper between a certain Island in the river St. Lawrence known and called by the name of "Isle au Rapid Plat" and the Banks along the American side of the said river, and to construct in such canal, and in the waters and places adjoining the same in addition to the dam already erected all such locks, dams,

and other works and devices as shall be necessary for the purpose of making a complete navigable water communication between the said Island and the American side of the said river,, and that they, their heirs and assigns may take the water which shall be contained within any lock, dam, pond, dyke, or other improvement made by them and make use of the same, either on their sole account or in connexion with any person or persons, for mills or other works for which the use of water is necessary which may be erected or constructed by them or to grant, bargain, sell or otherwise to dispose of the use of the said water to any person or persons for any lawful purpose and the monies, rents and profits, resulting therefrom to take and receive for their own use and benefit in addition to the tolls and profits hereinafter mentioned and allowed to be taken.

And be it further enacted That the said Joshua Waddington, David A. Ogden and Thomas L. Ogden, their heirs and assigns shall be and hereby are authorised to demand, take and receive from every boat or vessel passing through such canal or locks or either of them so to be made a certain toll not to exceed at or alter the rate of twenty-five cents per ton of said boat or vessel *Provided nevertheless,* That for all boats or or vessels under the burthen of two tons, the said Joshua Waddington, David A. Ogden and Thomas L. Ogden, their heirs and assigns shall be authorised to demand, take and receive the sum of fifty cents and no more, and for any boat or vessel exceeding the burden of six tons the sum of one dollar and fifty cents, and no more.

And be it further enacted That if the said Canal and Locks, shall not within the period of three years from and after the first day of July next be made and completed so that a boat or vessel of fifty feet in length and ten feet in breadth and two feet draught of water may pass and repass the same, then and in such case all the rights, powers and privileges hereby granted and vested in the said Joshua Waddington, David A. Ogden and Thomas L. Ogden, their heirs and assigns, shall cease and determine.

And be it further enacted, That the duration of this Act is hereby limited to seventy-five years, after which time all the powers, privileges, and advantages granted by it shall cease and determine."

I ask you to note the words:

That the duration of this act is hereby limited to 75 years, after which time all the powers, privileges, and advantages granted by it shall cease and determine.

I wish to call your attention first to the words describing the present dam, or so much of the present dam as was in existence in 1808, The words are: "In addition to the dam already erected."

That recognized the existence of this dam, and in that point there is, to my mind, the only matter in relation to this act that is difficult of interpretation. Did these words merely recognize the existence of this dam, or did they mean something more? Did they not mean that in recognizing that dam the right to maintain it was given? Consider the situation at the time of this act. Ogden was the riparian owner of each side of the stream. He had built this dam across a branch of the Little River without authority from the State, and if he had the right to build and maintain this dam without sanction of the Legislature of the State of New York, why did he come for this act? What was his purpose? If the river was nonnavigable, if there were no rights of navigation in that river, why did he come to the State of New York, seeking for what is given in this act, namely, the right to construct a canal. If it were private lands and private waters, he could dig his canal, he could maintain his dam without sanction from the State of New York. In coming to the legislature of the State for this act, they show beyond question to my mind that they knew or were uncertain of their status before the law, and that in procuring this act and in the reference to the dam already existing, they acquired and wished to acquire the sanction of

the State of New York to the dam then in existence, to the right to canalize the river at that point, for 75 years and no longer.

Mr. MIGNAULT. Was not the vital part of the statute the authority given to them to charge tolls, to build a lock and charge tolls. Otherwise, it may have been a matter of difficulty what tolls they might charge. And did they not require the authority of the legislature to give them the right to charge these tolls which are mentioned in the statute?

Mr. MCLEAN. I know of no statute or law in existence at the time of this act, namely, 1808, which required the citizens of the State of New York to acquire rights on a charter from the State to charge for the right of passage across private property. If this was in fact private property, they had the right, in my opinion, to charge tolls.

Mr. MIGNAULT. But, assuming it was not private property.

Mr. MCLEAN. Oh, then they must come to the legislature for the right, and it was necessary for them to have their charter.

Mr. MIGNAULT. I suppose your arguments amounts to a dilemma—either it was private property, or it was not.

Mr. MCLEAN. Absolutely.

Mr. MIGNAULT. And if it was private property, they could charge tolls without that authority.

Mr. MCLEAN. Yes.

Mr. MIGNAULT. And if it was not private property, they required the authority of the legislature, and the fact that they asked for authority would, according to your argument, show that they had no rights of ownership.

Mr. MCLEAN. Absolutely. We had no public-service commission in these days to regulate the charges for people crossing rights of way.

Mr. POWELL. One thing is clear, and that is that the public had the right of navigation in that stream.

Mr. MCLEAN. That is my contention.

Mr. POWELL. That goes without saying; that is admitted by everybody.

Mr. MCLEAN. No; I do not think Mr. Van Kennen admits that.

Mr. VAN KENNEN. I certainly have admitted it.

Mr. POWELL. That is step number one; step number two is that these people put a lock in there.

Mr. MIGNAULT. Putting in a dam is obstructing the right of navigation.

Mr. POWELL. They put in a dam with a lock in it. That was the only means of getting downstream. As a matter of common law they were obliged to give the use of that lock free, because it was a substitution for a natural right.

Mr. MCLEAN. Absolutely. If this was a public stream, it was absolutely necessary for them to come to the State of New York for this charter, because this act amounts to a charter.

Mr. POWELL. But the charter is only necessary in connection with the navigation right.

Mr. MCLEAN. No; not if it is public water.

Mr. POWELL. What you mean by public water is where the soil——

Mr. MCLEAN. And they are navigable waters.

Mr. POWELL. But it was in doubt whether it was in this party or not, and they went to the legislature out of abundance of caution. Assuming that this man, Ogden, was the owner of the soil, and he put in that lock, he was bound to allow the public to go up and down it free. Now, they went to the legislature to get the privilege of charging tolls there, where otherwise he was obliged to give free passage. That, to my mind, is the object of going to the legislature.

Mr. MCLEAN. And if he was obliged to go to the legislature for the right to put that lock in there and charge tolls, he was bound to go to the legislature for the right to block that channel with his dam. And the words "in addition to the dam already built" were put in for the purpose of acquiring from the State a recognition of the then existing dam and the right to maintain it.

Mr. POWELL. It was in doubt whether we had the right to put the dam there or not. The whole thing hinged on whether he was the owner of the bed of the stream or not, and he went to the legislature to quieten these doubts.

Mr. MCLEAN. Let me call attention to another feature of this act of 1808 which grants to Ogden and his associates:

> And that they, their heirs and assigns, may take that water which shall be contained within any lock, dam, pond, dyke, or other improvement made by them and make use of the same.

If they had in their private property in that water the use of water for their mills, to take water from the pond above this dam, then it was not necessary for them to go to the legislature to get that right. But they did. And the legislature, in giving them that right, said:

> That the duration of this act is hereby limited to 75 years, after which time all the powers—

not only the power to charge tolls, but—

> all the powers, privileges, and advantages granted by it shall cease and determine.

The right to charge tolls, the right to take water above the dams, to use it for mills, to sell it; all of these rights granted by that act to Ogden shall cease and determine. Historically, but of no interest except historically to the questions here raised, the dam or the locks and canal were not built within the three years required by the act. A further act extending the time was obtained, and then a second further extension of time was obtained, and the canal evidently was not built until some time in 1815.

Mr. TAWNEY. Was it finally built within the extended time?

Mr. MCLEAN. Yes; there is no question but that it seems to have been built within the extended time. I will now submit for your consideration the act of April 17, 1826. It is short, and I shall read it in toto:

> CHAP. 280.—An Act confirming to David A. Ogden certain lands situate in a branch of the river St. Laurence. Became a law April 17th, 1826, with the approval of the Governor. (Passed by a two-thirds vote.)
>
> *Be it enacted by the people of the State of New York represented in Senate and Assembly* That David A. Ogden of the County of St. Laurence being the proprietor of both sides of a branch of the river St. Laurence in the town of Madrid and across which river he has erected a dam and locks in pursuance of an act of the Legislature of this State passed April 1, 1808, shall and he is

hereby declared to be vested with all the rights of the people of this State to the lands situate below the said dam and which by reason thereof has been rendered susceptible of improvement and extending down the branch of said river, from the said dam to the navigable waters thereof. To have and to hold to the said David A. Ogden his heirs and assigns forever. *Provided* that nothing contained herein shall operate to prevent the people of this State, at the expiration of the term of seventy-five years from the said first day of April, one thousand eight hundred and eight, to alter and regulate the tolls on boats passing said locks, as they in their discretion may deem proper. *And provided further* that nothing in this Act contained shall be taken to prevent or in any manner to hinder the State from taking from the said branch of the river St. Laurence below the said dam any water for the use of any navigation canal or canals which may be constructed by the State or by virtue or in pursuance of any act of the Legislature of this State.

Please note that parenthetical clause in the act—

And which by reason thereof has been rendered susceptible of improvement.

In my attempt to properly construe these statutes before your honorable commission, I sought every source of information that I could think of, because I submit it is a true rule that in construing a statute we must, if possible, approach it as nearly as may be at the time when the statute was passed to find the intent of the legislators in passing that statute.

I went through the old records of the senate of the State of New York, and there I found the report of the senate committee on judiciary which was submitted with this bill, and feeling that it was pertinent to the question and should be laid before you when these statutes disclose difficulties of construction, I procured certified copies of that report of the senate judiciary committee to lay before you. Mr. Van Kennen has read this in toto, and so I shall not read it again. I shall only ask permission to call your attention to a few of the clauses. I read—

That the prayer of the petition is, in effect, that the State will release to the petitioner, and to those who have purchased under him, all the title which the State may have to that part of the bed or soil of the River St. Lawrence which lies between an island in the said river called "Isle au Rapid Plat," and the continent or main shore.

Mr. MIGNAULT. What is the date of that report?

Mr. MCLEAN. Thursday, 11 o'clock a. m., March 16, 1826.

Mr. MIGNAULT. That was before the act of 1826 was passed.

Mr. MCLEAN. This was the report which the senate committee on judiciary handed to the desk of the senate when they submitted this bill and petition, which had been handed in to them. The act was then moved, pursuant to the ancient procedure of the senate, to what is called second reading. It then had to lie on the desks of the members for some time by consent of the house for the house to concur, and, as a matter of fact, it came back from the house and was passed by the senate on April 17, 1826, and it was signed by the governor on the same day that it was passed.

Mr. TAWNEY. That is the report that accompanied the bill from the committee on judiciary in the senate.

Mr. MCLEAN. Exactly.

Mr. TAWNEY. And stating the reasons why they recommended the passage of the bill.

Mr. MCLEAN. Yes, Mr. Tawney; I know that you have made hundreds of such reports.

Mr. TAWNEY. I have made a good many.

Mr. McLEAN. I therefore deem it is proper for you to consider it, because it was a document accompanying the bill and presented at the time.

Mr. TAWNEY. Giving the reasons of the judiciary committee for their favorable consideration.

Mr. McLEAN. I think Mr. Van Kennen will agree that it is well to have it in for the elucidation of that statute.

Mr. VAN KENNEN. I am very glad it is in.

Mr. McLEAN. You probably look upon its effect from a different angle from that in which I view it.

Mr. MIGNAULT. You seem to agree that we should consider this report; otherwise I doubt whether you could refer to a report of that nature to construe an act of the legislature or an act of Parliament.

Mr. TAWNEY. The Supreme Court of the United States holds that a report acompanying a bill, favorably considered and acted upon by the Congress of the United States, is competent for consideration in the construction of a statute.

Mr. MIGNAULT. In some cases they have refused to allow such reports to be referred to, and in other cases they seem to have considered them as showing what was the state of the question when the legislature passed the act. The jurisprudence is not uniform on that.

Mr. TAWNEY. It depends on whether the intent of the legislature was clear from the act itself. If there is any doubt of the intent, recourse may be had to such a document as this.

Mr. MIGNAULT. I quite understand.

Mr. McLEAN. I just call your attention to the fact that in the preliminary part of this report they refer to the prayer of the petition as asking certain rights in the soil of the River St. Lawrence.

Mr. MIGNAULT. I suppose that original petition can not be found.

Mr. McLEAN. No; the original petition, I presume, has been lost. But the records of the senate and of the house were printed and are in the possession of the clerk of the senate, and if you will examine the certified copy you will find that this copy is certified to by the clerk of the senate of the State of New York.

Mr. MIGNAULT. As an official document?

Mr. McLEAN. Yes. These reports, as Mr. Tawney has said, are considered as official documents where they become necessary for elucidating the meaning of a statute. But the petitioners refer to this Little River as the River St. Lawrence, not as a nonnavigable branch, but as the River St. Lawrence. Again I quote:—

> The petitioner further represents, that a permanent dam with a lock has been erected across the said river by the petitioner, and that various buildings for manufacturing purposes have been erected, and are now erecting, on the bed of that part of the St. Lawrence which by the operation of the dam has been rendered occasionally dry.

It says they are "now erecting;" that is 1826.

Mr. MIGNAULT. That would be below the dam.

Mr. McLEAN. That is on the downstream side of the dam, and is represented on this chart, Exhibit N.Y–1 by these areas marked A, B, C, D, E, and F. Then I read:

> The petitioner further represents, and it is testified to by a witness whose deposition has been submitted to the committee, that the branch of the river

which is between the island and the main was unnavigable in its natural state for boats, though rafts went down occasionally at much risk, and generally with loss. The same witness further states in his deposition, that below the dam there is a space which, when the river is low, is not covered with water; but that during the summer season when the river is high, its bed is covered with water to the height of about 18 inches.

Referring again to these same areas lying below the dam. Proceeding, the report, of the committee says:

The petitioner claims to have title, in virtue of his being the owner of both shores, to the bed or soil of the river which lies between the island and the main, and represents that he has been advised by counsel that his claim is well founded. But apprehending that doubts may be entertained on this subject, and that any uncertainty as to his title may affect the value of the manufactories which have been erected and are erecting below this dam, the petitioner is desirous to have his title confirmed by a relinquishment of all right which the State may have, by an act of the legislature.

The committee do not feel themselves called upon to give any opinion as to the petitioner's claim of title.

but they go on and say that if the rights of the State of New York will not be injured, that in their opinion the senate may make this grant.

May I, as Mr. Van Kennen did, ask you to visualize for a moment the actual physical conditions that existed in 1826? The dam had been created, and, as recited in this act, it had been in existence for about 18 years. Along the downstream side of the dam were these areas, which had been rendered dry land at low stages of the water, or at other stages only covered by a few inches of water. Differing from the modern development of a water power, the mills had been placed along the dam across the stream. Naturally they could not be erected on the dam itself, and these buildings must have satisfactory foundations. The owners of the property and the builders of these mills had, therefore, erected buildings on these areas lying below the dam, but appreciating fully that they had no title to the areas occupied by their buildings—perhaps I am putting too strong an interpretation on it when I say "appreciating fully"—but by their own representation apprehending that there were doubts as to their title to these lands, they come to the Legislature of the State of New York and ask that title be given to them. And what do they ask? They ask that a title to the bed of the river be given to them of the entire channel of the Little River between Ogden Island and the main shore. That was their position. Now, I call your attention to the bill:

That David A. Ogden, of the county of St. Laurence, being the proprietor of both sides of a branch of the River St. Laurence in the town of Madrid and across which river he has erected a dam and locks in pursuance of an act of the legislature of this State passed April 1, 1808, shall, and he is hereby, declared to be vested with all the rights of the people of this State to the lands situate below the same dam and which by reason thereof has been rendered susceptible of improvement.

Just so soon as I began to study the situation and read that statute it struck me that these words "and which by reason thereof have been rendered susceptible of improvement" was an amendment that had been added by some one to the bill as originally drafted, and I did not reach a satisfactory solution in my own mind until through an investigation of the charter and of the historic references to the town of Waddington I found the condition of the buildings that

were erected below the dam, and then it seemed to me perfectly clear what was intended by this statute.

Mr. MIGNAULT. What is the age of that chart you have before you?

Mr. MCLEAN. Mr. King, you have the original from which this chart was made.

Mr. KING. It is the United States Survey, Detroit, not the last one. The survey is 1871, and it is revised up to 1910.

Mr. MCLEAN. I will say, as Mr. Van Kennen has outlined in his argument this morning, that these areas exposed to this dam and below the dam are all ledge rocks; they are not deposits of recent years, and I am perfectly willing to concede that probably they are the same ledge of rocks. That on the north side is called the Hog's Back, and the ledge runs clear across and across to this Little River. But it will be easily seen by a physical inspection that these areas are all ledge rocks, and they existed there from time immemorial. I shall read that part of the statute, first without the parenthetical clause and then with it. I first read without the clause:

That David A. Ogden, of the county of St. Laurence, being the proprietor of both sides of a branch of the River St. Laurence in the town of Madrid and across which river he has erected a dam and locks in pursuance of an act of the legislature of this State passed April 1, 1808, shall, and he is hereby, declared to be vested with all the rights of the people of this State to the lands situate below the said dam and extending down the branch of said river from the said dam to the navigable waters thereof.

To my mind that is what they asked, and the statute as passed reads—

shall and he is hereby declared to be vested with all the rights of the people of this State to the lands situate below the said dam, and which by reason thereof have been rendered susceptible of improvement, and extending down the branch of the said river from the said dam to the navigable waters thereof.

I believe that there is no other conclusion that can be reached in construing the meaning and intent of this act of 1826, but that it was a grant to Ogden and his associates, some kind of title to the lands upon which their mills were erected below the dam, or to such lands as in the use of the dam they might wish to occupy for the erection of their mills.

Mr. MIGNAULT. Your argument is that the parenthetical phrase, which you think was an amendment, had the effect to restrict the rights which they had asked from the legislature.

Mr. MCLEAN. Yes; merely to these areas below the dam occupied by them with their mills. The act further provides—

Provided, That nothing contained herein shall operate to prevent the people of this State, at the expiration of the term of seventy-five years from the said first day of April one thousand eight hundred and eight, to alter and regulate the tolls on boats passing said locks as they in their discretion may deem proper.

That also was a difficult problem to my mind to elucidate when I first studied it. Why should that privilege have been recognized in this act of 1826 as possibly to extend beyond the period of limitation in the statute of 1808? I think I found a satisfactory solution in the report accompanying the act of 1826 in which the committee says—

The committee have therefore prepared a bill, by which the state will relinquish any claim to the lands under the waters of the strait which divide the island from the main land, with a reservation to the State to take from it any

waters which may be required for canals or internal improvements, and reserving to the State also a right to regulate the tolls at the lock built by the petitioner, after the above-mentioned ter nhas expired; it having been represented to the committee that the lock is on the lands of the petitioner and does not occupy any part of what was the natural bed of the river.

Mr. MIGNAULT. That would mean that the lock was on the island.

Mr. MCLEAN. On the island and not in the bed of the river. In other words, that this act of 1826 was a conditional grant. It is, in fact, a tacit recognition of the fact that if that lock was on private land, that after the 75 years Ogden and his associates could charge any rate they pleased. The rate having been fixed only in the act of 1808, it would then have expired within 25 years, and it having been represented that this lock was on private lands, the legislature in its wisdom saw fit to say: Mr. Ogden, we will grant you these areas you have asked, but because we think there is this doubtful question, we are going to make this a conditional grant and we are going to attach the condition, in the interest of public traffic, that after the expiration of 75 years, if it be that this lock is on your private soil, the State, if in its wisdom, it sees fit to do so, shall have the right to come in there and regulate the tolls. That is all that it can mean, and that, I am positive, is what it does mean.

Mr. MIGNAULT. What is the title of the statute?

Mr. MCLEAN. "An act confirming to D. A. Ogden certain lands situated in a branch of the river St. Lawrence," certain lands; not the bed of the river.

Mr. MIGNAULT. But Mr. Van Kennen laid some stress on the word "confirming" as showing possibly that Ogden had already a title to these lands, and that this was a confirmation of the preexisting title.

Mr. MCLEAN. There is no question but that the word "confirming" is in the title of the act.

Mr. MIGNAULT. There is nothing in the act itself.

Mr. MCLEAN. There is nothing in the act itself, and of course the title of an act has no legal effect except as it may assist in elucidating the meaning of the statute.

Mr. MIGNAULT. Still, it is a part of the statute.

Mr. MCLEAN. It is, but the granting clauses are, without question, those that would under certain circumstances convey a fee—it says, "shall and he is hereby declared to be vested with all the rights of the people." But, there is just one thought in connection with that language of the statute there. I maintain that the rights granted under the act of 1808 ceased and determined in the year 1883, 75 years after the date of the passage of the act. The rights granted under the act of 1826 were of no effect without the dam. The dam is continued and the buildings, etc., may have continued for some time after 1883. But how? They were a tenant at will of the State of New York and they held in no other capacity. And while the language "vested" is used, I believe that that language is susceptible to interpretation as possessing not an absolute fee in perpetuity, but meaning a term of years consistent with the right to maintain the dam, and terminating when that right ceased, or when the people of the State of New York wished to exercise the privilege they undoubtedly had after the 75 years, to terminate that tenancy at will.

Mr. MIGNAULT. And as to the right below the dam, the title was granted forever by the act of 1826.

Mr. VAN KENNEN. It certainly was, from our standpoint, but Mr. McLean is trying to say it is a life lease.

Mr. MCLEAN. I am frankly in doubt on that point.

Mr. MIGNAULT. But still the language is express. They grant to D. A. Ogden the title to these lands forever, and they reserve, at the end of 75 years, the right to alter the tolls at the locks.

Mr. MCLEAN. Yes.

Mr. MIGNAULT. But the land appears to be granted forever.

Mr. MCLEAN. As to the meaning of an instrument, the rule of construction must be taken, as some judicial mind has expressed it, from the four corners.

Mr. MIGNAULT. The whole act must be considered.

Mr. MCLEAN. Now, there was a right here. We have a dam, navigation, water power, areas on which mills were to be erected, dependent upon the water power. It all was a unit. Wipe out your water power, and the reason for the occupancy of these lands ceased.

Mr. TAWNEY. Does not the water power continue as long as the dam?

Mr. MCLEAN. Yes, but——

Mr. TAWNEY. They have the right to maintain the dam for 75 years.

Mr. MIGNAULT. So far as any rights of ownership, except to these areas, the title was granted in perpetuity.

Mr. MCLEAN. That I am going to deal with under my second point.

Mr. MIGNAULT. I do not wish to disturb the continuity of your argument, but I thought I should call your attention to these words.

Mr. MCLEAN. I shall deal with that later. There is one further fact that I wish to call to your attention, and that is that the dam has been referred to by everybody as standing there to-day as it existed for over 100 years. That is not the fact, as you will see when I call your attention to some of the testimony. The area marked "K," as shown on Exhibit N. Y.–1, was entirely destroyed and has been replaced since the original dam was built. It was destroyed historically in 1832. Just what width of the dam was destroyed I can not say, and I do not suppose anyone can. But that connection between the dam and Ogden Island was destroyed, and it has been rebuilt and was rebuilt at that time in 1832 under the rights acquired under the statute of 1808, to reconstruct another dam or other structure that may be necessary for the enjoyment of Ogden of the rights granted under that statute.

Mr. MIGNAULT. They would, of course, have that right to reconstruct the dam if it had been carried away during the term, at least, of 75 years.

Mr. MCLEAN. Yes, and they did, but this is not the dam that was originally built prior to the act of 1808.

Mr. MIGNAULT. Do you argue that that makes any difference?

Mr. MCLEAN. I think it does.

Mr. MIGNAULT. I shall be happy to hear you on that.

Mr. MCLEAN. This point comes more particularly under the question of the navigability of this river. The testimony has shown

that a navigable channel exists and exists to-day along the upstream side of Ogden Island to the dam.

Mr. MIGNAULT. Where the lock used to be?

Mr. MCLEAN. Perhaps so and perhaps not. Our engineers tell us that it is impossible to tell because of the ancient character of the fill and of the long time that the lock has been abandoned. It may be that the lock was further to the north of the island.

Mr. MIGNAULT. But still there are some remains of the lock which identify the site of the lock.

Mr. MCLEAN. That I can not tell you.

Mr. MIGNAULT. There is testimony to that effect. Is there not testimony that you can identify the lock.

Mr. VAN KENNEN. Yes.

Mr. MIGNAULT. Some protographs were put in the record showing the remains of the lock.

Mr. TUCKER. Exhibits 19 and 20 show that.

Mr. MCLEAN. I present a photograph which was taken by our engineer and that represents all that we can find of the lock. With the permission of the commission I shall file this photograph as Exhibit N. Y.–5, showing the old state of the lock as it exists to-day.

Mr. POWELL. What is the purport of that?

Mr. MCLEAN. It is more of historical interest than anything else. I did not offer this as an exhibit until the discussion arose now.

Mr. MIGNAULT. Continue your argument.

Mr. MCLEAN. My contention, which I will develop further is that there has always existed a navigable channel up the downstream side of that dam, and there exists such a channel to-day, and that the grant of 1826 could not have conveyed to Ogden and his associates the title of lands in that navigable stream, or if it did so convey it, it was subject to the right of the state to appropriate it for any purpose that it saw fit.

Mr. VAN KENNEN. Be a little clear on that, Mr. McLean.

Mr. TAWNEY. Let me see if I understand the contention which you wish to make to the commission. Is it that the applicant is not a riparian owner?

Mr. MCLEAN. I have not touched on that question yet; I shall take that up in dealing with my second point. My position, in brief, is this——

Mr. VAN KENNEN. Your position is, that under the law of 1826, if I understand it, Mr. Ogden did not get the title and fee to the lands below the dam, but merely got the right to use them for 75 years. Is that it?

Mr. MCLEAN. Not quite.

Mr. VAN KENNEN. He must have some kind of a title and I want to know what it is.

Mr. MCLEAN. I think he undoubtedly did get some kind of a title to the areas below the dam, shown on this exhibit N. Y.–1, marked A, B, C, D, E, upon which he erected buildings at that time, or within a reasonable time thereafter, or during the balance of the 75 years he did erect his mills. I do not think he acquired title to the bed in the strip of the river running from the main shore, below the dam, across to Ogden Island.

Mr. VAN KENNEN. You concede that he got absolute title to some of them; is that right?

Mr. MCLEAN. No, Mr. Van Kennen, I do not think that he did.

Mr. VAN KENNEN. I wanted to know what your position was; that answers it.

Mr. MCLEAN. I think he got absolute title during the 75 years as against all the world.

Mr. VAN KENNEN. He could not have any such title as that under any circumstances.

Mr. MCLEAN. I would also call your attention to the fact that the testimony shows that at the point A where the applicant has asked for permission to erect a dam in the alternative, according to the testimony of Mr. Connolly, there is 12 feet of water. There is no question but that 12 feet of water there constitute that navigable water. And that, broadening the act of 1826 to its utmost possible limits, Ogden and his associates got only title down to navigable water, and, therefore, at the point A on plate 1, under the act of 1808 and under the act of 1826, these applicants got absolutely no title whatever; and that by their own testimony.

Mr. POWELL. Because you say that is in a navigable channel?

Mr. MCLEAN. In 12 feet of water.

My second point is, that the applicant had no right to erect the structures proposed, because of the fact that they are riparian owners. And that brings me to the broad question of the law of the State of New York in and to the bottom soil of navigable streams, and the rights of the riparian owners in these streams, if any. Of course our right in navigable streams is an inheritance from the common law of the mother country, and I think that I can place before you, in the language of a very learned judge, the doctrine that it is the law to-day in the State of New York, more clearly than I can express it in my own language. I shall give you the opinion of Mr. Justice Vann, a very eminent jurist in the State of New York, who served for many years on our court of appeals. I refer to 198 New York Reports, page 287, in the case of Lewis Bluepoint Oysters Cultivation *v.* Briggs:

> The king of England had title to the land under navigable waters throughout his kingdom as his private property, which he could dispose of as he saw fit without restraint or hindrance from the law. This was known as the jus privatum held by him in his individual capacity. (Commonwealth v. Alger, 7 Cush. 53, 82, 90; Hale De Jure Maris, 11; Hargrave's Law Tracts, 84, 89.) The king also had title, as sovereign and in no sense as proprietor, to the navigable waters themselves within rivers and arms of the sea where the tide ebbed and flowed, but he held them in trust for his people and he could not dispose of them by grant or otherwise. They were incapable of private ownership, for they were the jus publicum held by the king in a representative capacity. (Id. Brackton b. 2, ch. 5, par. 7; Moore's History of the Foreshore, 446, 533, 782; Hale De Portibus Maris, 85.)
>
> "The jus privatum of the owner or proprietor," said Lord Hale, "is charged with, and subject to that jus publicum which belongs to the King's subjects; as the soil of an highway is, which though in point of property it may be a private man's freehold, yet it is charged with a public interest of the people, which may not be prejudiced or damnified."

That is the principle, and while in the examination of cases—they are, of course, border line cases, and it is difficult to distinguish some of them—but by bearing these principles in mind I believe our courts

have been consistent in their rulings on the questions that have come before them.

Mr. POWELL. These rights only consist of two rights—the right of fishing and the right of navigation.

Mr. MCLEAN. Yes.

Mr. POWELL. And they do not even include the right of bathing?

Mr. MCLEAN. The common law is capable of extension; conditions change as the years roll by.

Mr. POWELL. Yes, but the people always bathe.

Mr. MCLEAN. Only within the last year one of our New York judges has held that at Coney Island, where the grant of the foreshore and also to the lands under water was given to a private corporation, that corporation could not exclude the people from bathing in these waters.

Mr. POWELL. Your law differs from the English law.

Mr. MCLEAN. I am familiar with the decision reported and treated by Sir Matthew Hale, where the right of bathing was prohibited.

Mr. MIGNAULT. At all events, there is no right of bathing involved in this case.

Mr. MCLEAN. The first case which I wish to present to this commission is the case of Gould *v.* Hudson River Railway (6 N. Y., 522). That was a very early case and was practically the second case that I could find which construed the rights of riparian owners in navigable waters. It mentions the prior case of Lansing *v.* Smith. In this Gould case the Hudson River Railway Co. obtained a charter from the State of New York to the railway company to run its tracks along between high and low water marks of the Hudson River. Mr. Gould was the riparian owner and he sued the railway for damages because of the fact that he was blocked from his access to the navigable waters of the Hudson River. The court held:

> That the owner of lands adjoining a navigable river in which the tide ebbs and flows has no private right or property in the waters of the river * * * and is therefore not entitled to compensation from a railroad built along shore between high and low water mark.

Then, Lansing *v.* Smith, 8 Cowan, 146, is quoted with approval, and it said:

> I will not pursue this subject further for it seems to me, if any principle was ever settled, this case settles the principle, that the legislature has the right to regulate and control all navigable waters within the State as in their judgment the interest and commerce of the public may require.

That was the law as expressed by the courts at that time with respect to the Hudson River. These were earlier cases and the court in commenting recognizes the English principle of waters where the tide ebbs and flows.

Mr. POWELL. Does that not turn on the peculiar wording of the statute. It is a most elementary principle of law, Mr. McLean, that a riparian owner, adjoining tidal waters, has the right of access to the river. Where does anybody question that?

Mr. MCLEAN. He has the right of access, of course. This case was brought on the point of taking away his further rights, not presumably simply his right of access. But in any event the court of appeal held that the public use, and the grant to this railway was

a public use, was of superior importance to the rights of the riparian owner.

Mr. POWELL. That is, according to the statutes.

Mr. MCLEAN. There was no statute passed; it is based entirely upon the common law.

Mr. POWELL. That can not be common law.

Mr. MCLEAN. That is the law of our State, and I have not found a case in which that has been upset.

Mr. POWELL. It may be the law of that particular case on its facts, but that is not the law of the State.

Mr. MCLEAN. There is no doubt that a riparian owner, where a public servitude does not intervene, has the right of access and servitude, but the point is clear that these rights which were granted to him, if we go back to the principle as set forth by Judge Vann, were the jus privatum and are subordinate to the jus publicum.

Mr. MIGNAULT. The right of access is not very material; the question on which I would be pleased to hear you is as to the ownership of the bed of the river.

Mr. MCLEAN. That case established that the bed of the Hudson River belonged to the people of the State of New York.

Mr. MIGNAULT. But does that not go on the fact that the grants excluding the bed of the river, were, that the old Dutch settlers, according to their law, owned the bed of the river, the Dutch law not being the same as the English common law.

Mr. VAN KENNEN. That is precisely as I understand it.

Mr. MCLEAN. That does not appear in this case.

Mr. MIGNAULT. According to the civil law principle, the bed of a navigable river does not belong to the riparian owner; that may or may not have been the Dutch law, but——

Mr. MCLEAN. But this case was not decided under the Dutch law, but under our English common law.

Mr. MIGNAULT. But as the State of New York succeeded to any rights which the Government possessed under the old Dutch law, possibly the State of New York acquired the bed of the Hudson River, and I think the same has been asserted as to the Mohawk River.

Mr. VAN KENNEN. The principle is a little different in the case of the Mohawk River. I see some reference to that effect in the decision of one of your courts, I think it was in connection with the Long Sault Development Co. case.

Mr. POWELL. The same was held in the case of the St. Lawrence River, namely, that the old French law applied.

Mr. MCLEAN. On that point I was going to refer to the case of the People *v.* Tibbets in 19 New York at page 523. This was a case where a dam had been erected across the Hudson River, and where one-half of the surplus waters in that river were leased to the riparian owner who owned the banks of the river at the Long Sault or west side of the dam.

Mr. MIGNAULT. With a lease of the water.

Mr. MCLEAN. A lease of one-half of the surplus water at the dam. The leasehold was for 999 years. It passed from the original lessor down to his heirs until it got into the hands of Mr. Tibbets, who did not pay his rent. He was sued for that rent by the people of the

State of New York. He set up as his defense that he owned that surplus water, not as a lessee but by right as the riparian owner. This case refers to the same Hudson River.

Mr. POWELL. Was it tidal at that place?

Mr. MCLEAN. The court still retained the principle of the tide ebbing and flowing; it was beginning to get away from it a little later on. The court says that it knows no particular reason, if the river is suitable for commerce, why this rule should continue, but it does recognize the rule in this case, and the court says (p. 526):

> If in this instance, as I shall presently show, the river was the property of the people, there was no mistake. The defendant was then bound to prove that the river was a private stream; and there was no evidence to that effect.
>
> If the Hudson River was, previous to the construction of the dam, a navigable stream at Troy, and there had been no grant of it by the colonial governors under the King of Great Britain, or the people, then it was the property of the people. A river is considered as an arm of the sea, and as such navigable, so far as the tide rises and falls. That is a technical rule of early establishment, and of uniform and constant adherence. Some judges and authors have maintained, incidentally, that the rule did not apply where the water ceased to be salt or brackish, or where there was no tidal current up the river. But I have not seen any case where it was so decided, nor any authority where it was separately and distinctly stated.

Mr. VAN KENNEN. What year was that?

Mr. MCLEAN. 1859. On page 528, the court says:

> It is beyond dispute that the State is the absolute owner of the navigable rivers within its borders, and that, as such owner, it can dispose of them to the exclusion of the riparian owners. In this case, the State exercised its power of disposition in making the lease, and, consequently, such lease is valid.

The court ordered a reference because the plaintiff had been nonsuited. But that was the law following the Lansing case and following the Hudson River case, and this case of the People *v.* Tibbets. Mr. Van Kennen in his argument said that at the time of these grants if this had been construed that undoubtedly it would have been held by the courts that the title to the thread of the stream was in Ogden. He had not cited any cases to show that that was the law of the State of New York at the time, and in the absence of any case declaring that to be the law, I must differ from him, because I think the law, as these early cases have shown, was that the title to a navigable river was in the people of the State of New York. It is true that the earlier cases limited navigable rivers to where the tide ebbs and flows, not in their decision, however, but purely as obiter.

Mr. MIGNAULT. Mr. Van Kennen's argument was that this was not a navigable river and therefore the title went to the thread of the stream.

Mr. MCLEAN. I do not dispute that. If this is not a navigable river there is no question but that his statement of law was right.

Mr. VAN KENNEN. With the definition of navigability at that time.

Mr. MCLEAN. I understand Mr. Van Kennen's argument to be—I think, Mr. Van Kennen, you said that if it were a navigable river his title would not be to the bed of the stream.

Mr. VAN KENNEN. Where the tide flows.

Mr. MCLEAN. You say that unless it is a tidal river it is not a navigable river in the sense of the definition of navigability.

Mr. VAN KENNEN. Not at that time.

Mr. MIGNAULT. You say that Ogden's rights are to be construed according to the law at the time he received them.

Mr. MCLEAN. But my contention is this: That there is no judicial construction of navigable waters at that time which would justify Mr. Van Kennen's submission.

Mr. MIGNAULT. That is a point upon which I would like to have some authority.

Mr. POWELL. I refer to this reported case of Smith *v.* The City of Rochester, 92 New York Court of Appeals, page 463.

(Mr Powell gave the citation from Smith *v.* Rochester, 92 Court of Appeals, page 463, and continued:)

That is a very clear-cut decision; you can not get a cleaner-cut decision than that.

Mr. MCLEAN. I am not familiar with that case, but it seems to refer to a lake.

Mr. POWELL. Yes; but it includes lakes with rivers.

Mr. MCLEAN. All I can say is that in many cases the obiter may lead on first inspection to difficulties, and it requires the facts and a study of the underlying principles to find out whether the court has really properly construed the law or not. I shall be very glad to examine that case, and if I am permitted to file a brief in comment upon it.

Mr. POWELL. There is this to say about it, that you might say that dictum is obiter dictum, for the simple reason that the stream that was under consideration in that case was a nonnavigable stream, but there is the decision.

Mr. VAN KENNEN. That was on the Genesee River.

Mr. POWELL. Yes; at Rochester.

Mr. MIGNAULT. May I say this, that in this case to which Mr. Powell has referred, the case of Gould *v.* The Hudson River Railway Co., is distinguished, so I presume there are some remarks referring to it.

Mr. MCLEAN. I shall be glad to have an opportunity of commenting on that case.

Mr. POWELL. That was in 1883.

Mr. VAN KENNEN. I do not think they clung to the old rule as late as that; I have read that case.

Mr. MCLEAN. As to the rule in New York as to what are navigable streams, in Morgan *v.* King (35 New York, 454) the court laid down this rule, which has been followed very generally. I quote from page 459:

> The true rule is that the public have a right of way in every stream which is capable in its natural state and its ordinary volume of water of transporting, in a condition fit for market, the product of the forests or mines or of the tillage of the soil upon its banks. It is not essential to the right that the property to be transported should be carried in vessels or in some other mode whereby it can be guided by the agency of man, provided it can ordinarily be carried safely without such guidance. Nor is it necessary that the stream should be capable of being thus navigated, against its current as well as in the direction of its current. If it is so far navigable or floatable in its natural state and its ordinary capacity as to be of public use in the transportation of property, the public claim to such use ought to be liberally supported.

That is the best definition I can get. Now to return to this point of what are navigable rivers.

Mr. POWELL. There is another point to which I wish to draw your attention. A stream may have portions of it navigable and other portions of it nonnavigable, alternating; it may have a stretch nonnavigable, with a stretch of navigable, and resume its navigability and nonnavigability alternately. I wish to call your attention to that. It appears to have been recognized by the Legislature of New York that at this point it was not navigable, because it refers to the stream where it becomes navigable again.

Mr. VAN KENNEN. That refers to the particular case which Mr. McLean has cited. It is precisely what they held in that case. They held that that particular stream, which is one of the inland streams and one of the best power inland streams in the State of New York, was nonnavigable.

Mr. MCLEAN. In its upper reaches.

Mr. VAN KENNEN. The Raquette River, right at Potsdam, within a short distance of the St. Lawrence River.

Mr. MIGNAULT. In the case of Smith *v.* Rochester, 479, I quote.

(Mr. Mignault cited from the case at page 479.)

Mr. MCLEAN. That is the point to which I am coming. The court got away from the doctrine of the tide ebbing and flowing and came down to exactly the principle Mr. Mignault has cited, and that is most clearly stated in all the cases I have found. I refer to the Illinois Central Railway *v.* Illinois, 146 U. S. Sup. Ct. Repts., p. 387. That was a case in which certain rights had been granted under the waters of Lake Michigan to the Illinois Central Railway, and the question came up as to what the rights of the railroad were to build a long dock over these waters.

Mr. MIGNAULT. That was the dock at Chicago; I am familiar with that.

Mr. MCLEAN. Yes; and the court discussed it very fully. Mr. Justice Lurkin discussed the whole question there, and gets away entirely from the tide-water rule, and says that is not the true rule in this country, and points out why it is not, because our inland seas and rivers are many hundreds of miles away from the salt water, and he says the principle is just as true with respect to fresh water, if in fact the rivers are navigable and the lakes are navigable. He refers to the two rights which we received from the sovereign of England, the private right and the public right, and he says that when the State has granted a jus privatum, no matter what the nature of that grant may be, it is always subject to the jus publicum.

Mr. POWELL. No one disputes that.

Mr. MIGNAULT. You need not elaborate on that.

Mr. MCLEAN. Now, I can answer Mr. Van Kennen's query about the title to these lands which were granted under the act of 1826. He asked me if I did not believe that the grantee there acquired absolute title in fee, and I am able to say; no, because what was granted to them; it is the jus privatum and it was subject to the jus publicum. And if the State of New York ever has to exert its right of navigation, or other rights inherent to it, it has the right of doing it and it has the right of taking those lands in the bed of that stream, without compensation to the grantee.

Mr. VAN KENNEN. We need not quarrel about that.

Mr. McLEAN. That is important because it shows what the rights of the State were to the bed of this stream, if it were a navigable stream.

Mr. MIGNAULT. It is assumed to be a navigable stream in the act of 1808.

Mr. McLEAN. The acts all consider it a navigable stream. That will close my argument on that point, and I shall summarize very briefly.

In the acts of 1808 and 1826 I believe that the then grantees acquired the right, which was recognized by the statutes, to maintain the then-existing dam for 75 years; I believe that under the act of 1826 the State granted title to Mr. Ogden and his associates in so far as it could, under this theory of the rights held as a proprietor to the areas occupied at that time by the mills and buildings then erected or in process of erection.

Mr. TAWNEY. Right there—I have been examining these two acts, and I want to ask you a question. The act of 1826 has very little, if any, relation to the act of 1808, so far as the grant of rights is concerned. The act of 1808, as I analyze that act, grants the right to construct the canal in addition to the dam previously erected across this river.

Mr. McLEAN. Yes.

Mr. TAWNEY. The right to take the water above the dam, the right to charge toll for the use of the locks, the limitation of the life of the act to 75 years—that, in substance, is all that is contained in that act. Now the act of 1826 begins with a recital recognizing the proprietary ownership of both sides of this river in David Ogden, and it vests in him all the rights of the people of the State of New York to the lands—

situate below the said dam and by reason thereof——

That is, because they are situated below the dam—

has been rendered susceptible of improvement and extending down the branch of said river, from the said dam to the navigable waters thereof. To have and to hold to the said David A. Ogden, his heirs and assigns, forever.

Is not that a grant to all of the land below the dam down to the navigable water of that river, in perpetuity?

Mr. McLEAN. No. It says: "Lands rendered susceptible of improvement because of the said dam."

Mr. TAWNEY. The language does not justify that construction—

shall and he is hereby declared to be vested with all the rights of the people of this State to the lands situate below the said dam and which by reason thereof has been rendered susceptible of improvement.

That is, all this land, by reason of the construction of the dam, has been rendered susceptible of improvement down to the navigable part of the river.

Mr. McLEAN. What was the improvement that was being made at that time?

Mr. TAWNEY. I do not know.

Mr. VAN KENNEN. What difference does it make?

Mr. McLEAN. It makes every difference in the world.

Mr. TAWNEY. There is no evidence to show where these mills were located.

Mr. McLEAN. The ruins are there to-day, and it is a matter of evidence that the ruins are there to-day.

Mr. MIGNAULT. All the ruins are on the downstream side of the dam.

Mr. SPRATT. Below the dam.

Mr. VAN KENNEN. If you recall the testimony of Mr. Rutherford, given in Atlantic City on that point, it pretty fully covers that ground. He gave the names of the mills, about the time they were built, and so on.

Mr. TAWNEY. As I read this, it, at the present time, seems to me clear that this is a grant to David A. Ogden of all the lands in the bed of that river from the dam down to the navigable part of the river.

Mr. VAN KENNEN. And our evidence shows that is something like 1,000 feet.

Mr. TAWNEY. There is another phase of this, and before you leave this branch of the case I would like to speak about it. I would like to know what your judgment is, Mr. McLean, as to the effect of the act of 1826, by implication, repealing the limitation of the act of 1808, as to the time of its duration.

Mr. McLEAN. As I stated in my first argument, I was disturbed on that, but the point was clarified when I read a report which refers to that very privilege which is given and says that it is given because some people say, or because it is represented, that the lock is on the private land of David Ogden. And that was the reason.

Mr. TAWNEY. How do you interpret this. The act of 1826 says in this proviso:

Provided, That nothing contained herein shall operate to prevent the people of this State, at the expiration of the term of seventy-five years from the said first day of April, one thousand eight hundred and eight, to alter and regulate the tolls on boats passing said locks as they in their discretion may deem proper.

If they intended that the act should terminate in 75 years, there was no question about it.

Mr. McLEAN. The reasons for that are cited in the report of the judiciary committee, and one of them is this—

it having been represented to the committee that the lock is on the lands of the petitioner, and does not occupy any part of what was the natural bed of the river.

In other words they said: We are going to grant you these lands, but if this lock is on your own land, it can continue after the 75 years, but because it is more or less of a public utility, we are going to say that we will have the right to regulate the tolls.

Mr. TAWNEY. Whether the lock is on his own lands or on public lands, the right to regulate tolls is a right vested in the legislature.

Mr. McLEAN. In 1826 that right was not recognized as it is to-day. I have no doubt that in 1826 the right, so far as regulating charges of that kind is concerned, depended on absolute private ownership.

Mr. TAWNEY. The law of navigation was exercised at that time.

Mr. McLEAN. Yes; but the rights of navigation would be in public waters.

Mr. TAWNEY. They describe that navigation that it was navigable.

Mr. McLEAN. I say it was navigable, and that was the reason for the grant.

Mr. TAWNEY. If he constructs his lock he would——

Mr. MCLEAN. I have another answer to that, and it is this: It is a well-recognized rule of construction that the general proposition with respect to the construction of a grant, that it is construed against the grantor, is absolutely reversed when the grant is from the sovereign to the people or from the State to the people. The reason for it is that the rights of the public are involved, and on that point I want to cite what Mr. Gould says in Gould on Waters, third edition, page 86:

> If the terms of the grant are doubtful, that construction will be adopted which least restricts the rights of the State and of the public; inasmuch as public grants, whether made by the Crown or by Congress or by a State, are construed strictly, and pass only what appears by express words or necessary implication.

Mr. TAWNEY. I do not question but that is the rule of construction, but the application of it is what is bothering me here.

Mr. MCLEAN. Mr. Justice Vann cited the same rule in the case of the Bluepoint Oyster Co. *v.* Lewis, already referred to; and in the case of the People of the State of New York *v.* Staten Island Ferry Co. (N. Y.), the court says:

(Mr. McLean read the citation.)

So that the rule is here, if there is any doubt about the construction of a statute, that doubt must be resolved in favor of the State.

Mr. TAWNEY. The last proviso of the act of 1826 is significant, as indicating the idea that the legislature recognizes that these rights may exist after 75 years—

> *And provided further*, That nothing in this act contained shall be taken to prevent or in any manner to hinder the State from taking from the said branch of the river St. Lawrence below the said dam any water for the use of any navigable canal or canals which may be constructed by the State or by virtue or in pursuance of any act of the legislature of this State—

recognizing the fact that these works might continue, but, notwithstanding that, that the State reserves the right to use the water below the grant, notwithstanding the grant of the bed of the stream to the grantee in that case.

Mr. MCLEAN. And does not that strengthen my argument, that there was granted under the act of 1826, visualizing it by what was being done at that time, the construction of these mills along the dam—that title was granted only to such lands as those on which the mills were erected or were to be erected for the purpose of using the power at that dam?

Mr. TAWNEY. We know very well that a grant of that kind would be absolutely worthless, because there must necessarily be opportunities for ingress and egress, and that river is not so wide there that there was opportunity for building all of these mills without giving them the means of getting in and out.

Mr. MCLEAN. The photograph of the dam as it exists even to-day shows that there was a roadway across the top of the dam, and that was undoubtedly their way of ingress and egress.

Mr. VAN KENNEN. You are mistaken about that.

Mr. TAWNEY. The idea of a specific description of little plots of land here and there below the dam seems to me to be almost inconceivable.

Mr. POWELL. It would be vague for uncertainty.

Mr. MCLEAN. That is all they wanted it for.

Mr. TAWNEY. There was no description given.

Mr. MCLEAN. There was no necessity for any particular description.

Mr. TAWNEY. No, because they intended to grant all the land below the dam down to the navigable water. If it is material in this case, it seems to me clear from those acts themselves that that is the grant, but I do not express any fixed opinion on that.

Mr. MCLEAN. Of course, Mr. Tawney, I am not saying that the areas granted were limited to the four corners of the building that was constructed there. I think that would be unreasonable. Of course when the four walls were erected, and it was necessary for them to have ingress and egress, I think without any question the necessary lands went to give them access.

Mr. MIGNAULT. I think the whole thing is in a very small compass. By the act of 1808 Ogden took no title to lands whatever, unless you can say by implication he got some title to the dam. Then by the act of 1826 he did get a certain title to lands below the dam, and the question to my mind is, whether those lands should be restricted to those which were susceptible of improvement or whether all lands between the dam and the navigable waters below were included. That is the whole question.

Mr. MCLEAN. That is the whole question there.

Mr. MIGNAULT. I do not think you need elaborate that at any length.

Mr. VAN KENNEN. We handed in an elaborate picture showing that there were quite a number of factories there.

Mr. MIGNAULT. That does not help very much.

Mr. VAN KENNEN. Except that some one asked what there was there.

Mr. MCLEAN. I wish to cite to the members of the commission the Chandler-Dunbar case, 229 United States, page 53:

> This title of the owner of foot land upon the shore of a navigable river to the bed of the river is at best a qualified one. It is a title which inheres in the ownership of the shore, and, unless reserved or excluded by implication, passes with it as a shadow follows a substance, although capable of distinct ownership. It is subordinate to the public right of navigation, and however helpful in protecting the owner against the acts of third parties, is of no avail against the exercise of the great and absolute power of Congress over the improvement of navigable rivers * * *.
>
> But the flow of the stream was in no sense private property, and there is no room for a judicial review of the judgment of Congress that the flow of the river is not in excess of any possible need of navigation.

That recognizes these rights which were also set forth in the Illinois case.

Mr. POWELL. Gould is regarded amongst English-speaking authorities as one of the most authoritative books on waters that was ever published on this continent. It may be interesting to note what Gould says about that. I read article 57—

> 57. In New York, the question has given rise to conflict of decision. The later decisions adopt the common-law rule, which has been held there applicable to streams of the first magnitude, such as the Hudson, the Oswego, and the Genesee Rivers. The Mohawk River seems, however, to form an exception. In the case of the People *v.* Canal Appraisers, Davis, J., delivered an elaborate opin-

ion, in which he held that this river was public property, upon two grounds: (1) That the word "navigable" denotes merely navigability in fact, and is so employed in the early authorities; (2) that the course of the State's legislation had been such as to amount to a reservation for public purposes of the Mohawk and other navigable rivers of the State. This decision does not appear to have been expressly overruled in its application to the particular river, but the first ground on which the judgment proceeds can not now be regarded as tenable. The Niagara River, which is the national boundary between the United States and Canada, also forms another exception, under the decisions in New York, to the application of the common-law rule in that State.

And that would be on the ground that it is an international stream. There you have one of the most authoritative books written on that subject.

Mr. McLEAN. There is no question but that he is an authority.

Mr. POWELL. The same thing is laid down in Farnham.

Mr. McLEAN. That does not differ from my position fundamentally or from the principles I have shown have been established in this case.

Mr. MIGNAULT. There was some reference this morning to New York decisions, and it was stated by Mr. Van Kennen that they were the cases of the Long Sault Development Co.

Mr. McLEAN. That is 212 New York. There is an opinion there as to the question of whether a riparian owner has any rights to the bed of a boundary river.

In that case the court said that the title to the St. Lawrence River was in the State of New York.

Mr. MIGNAULT. That was decided, and I think it went to the Supreme Court and was upheld.

Mr. McLEAN. The United States Supreme Court said with respect to that case (242 U. S., p. 280)—and mind you it went to the Supreme Court of the United States on the question involved of a repealing act. The Legislature of the State of New York passed an act repealing the charter of the Long Sault Co., and the company took the case to the United States Supreme Court on that point, that that act was unconstitutional, because it was in violation of a contract.

Mr. MIGNAULT. I think they were to make certain payments to the State of New York Appeal Court, and they tendered a payment of $25,000, which was refused, and they took out mandamus proceedings to force the treasurer of the State of New York to accept it.

Mr. McLEAN. Exactly.

Mr. MIGNAULT. And the answer was that the statute was unconstitutional.

Mr. McLEAN. That was in the State court, but they got into the Federal court on a different theory. When they went to the Federal court they interjected into it this question of the statute repealing the right, and here is what the United States Supreme Court said:

This discussion of the decision by the court of appeals makes it very clear that that decision does not give any effect whatever to the repealing act of 1913, but that wholly independent of that act and proceeding upon sound principles and abundant authority the court arrived at the conclusion that the act of 1907 was unconstitutional and void; and therefore it results that this case does not present any question for decision under the Federal Constitution, and that for want of jurisdiction the writ of error must be dismissed.

Mr. TAWNEY. That was a ratification by the Supreme Court of the decision of the court of appeals in New York.

Mr. McLEAN. Exactly, and it was held that the State of New York had no right to hand away the right to control the navigation

of the St. Lawrence River, that it was a public, navigable stream, and when under the charter the Long Sault Co. agreed to keep navigation in as good a state as it was, the court said: That is not sufficient, that is ceding the right of the people of the State of New York to this river to a private corporation, and that is unconstitutional and the statute is unconstitutional. These were the real grounds upon which the State of New York decided that case, and the United States Supreme Court said these were substantial grounds.

In conclusion, I wish to say that my contention is that this Little River is a component part of the St. Lawrence River; that the St. Lawrence River is a public navigable stream, and has been, so long as we have known it, from the earliest times; that the fact that they had a fill or road across this Little River does not do away with the fact in the slightest degree that it is a navigable river; that it is true that in the earliest days boats navigated this Little River and carried around this rapid, if they had to, and that has been done in many instances on rivers which are held, like the St. Lawrence, to be navigable rivers.

Mr. MAGRATH. Your contention then is that the applicants have no title to the bed of the stream.

Mr. MCLEAN. Yes.

Mr. MAGRATH. And, therefore, can not lawfully construct the proposed works across the Little River.

Mr. MCLEAN. Without the consent of the State of New York or authority from the State.

Mr. MAGRATH. Of course, you know this commission has no power to render a decision on any legal right the applicants may have in the lands on which works are to be constructed.

Mr. TAWNEY. I do not know that that is correct.

Mr. MAGRATH. It seems to me that whatever legal rights these applicants have can not be disturbed by this commission.

Mr. TAWNEY. They can not be destroyed by us.

Mr. MAGRATH. We can not add to or take away from them, and the argument has all been based, I take it, upon the assumption that we have certain rights.

Mr. TAWNEY. We are to find out what their right is.

Mr. MCLEAN. My position is that a stranger to the question at issue can not come in and put the machinery of this commission at work. That is putting it rather roughly, perhaps, but that is the underlying principle. It is: That unless the applicant can establish a title to the inherent property rights that are a necessary part of his plan of development, that he is in fact a stranger, and, therefore, it is necessary for your own ruling to determine for yourselves whether or not the applicant has title. I do not think any decision that you make can oust the State of New York from whatever title it has in and to the bed of the Little River. But I think we would be very derelict in our duty, having been invited to attend before this honorable commission, and feeling, as we do, that there is this defect in the title of the applicants, if we did not lay that position before you.

Mr. MAGRATH. You oppose the granting of this application upon the ground that the applicants must first approach the State of New York and get your authority?

Mr. McLEAN. That is exactly it. I do not go so far as to say that we actually oppose it, but I say it is necessary first that they should have permission from the State of New York before they can erect these works. That is my contention before you.

Mr. MIGNAULT. Are you interested in the contention of Mr. Van Kennen as to the natural flow of the Little River and what the natural flow is?

Mr. McLEAN. I think Mr. Van Kennen and I are absolutely agreed upon that point; we are going to have an examination made, which I understand we have the permission of this commission to make. I thought, therefore, it was not necessary to take up any time in arguing that. Mr. Van Kennen, I think, agrees with me that if he establishes title there to the proposed works as riparian owner, or under the acts of 1808 and 1826, his right to the use of the water is only to the natural flow, and that any excess of water over the natural flow can only be lawfully used by him with the consent of the State of New York. Is that right, Mr. Van Kennen?

Mr. VAN KENNEN. I ought to say yes. But I do not know whether it is the consent of the State of New York or the consent of the Federal Government. I do not know where I have to go on that. There is a dispute between the State of New York and the Federal Government as to which controls the waters. I do not want to admit anything on that point that would prejudice my right to some other.

Mr. McLEAN. May I ask you whether you assert any right on the part of this applicant in and to any excess of waters in the Little River over and above the natural flow?

Mr. VAN KENNEN. Not as a matter of right.

Mr. McLEAN. He asks it as a matter of favor.

Mr. VAN KENNEN. I ask it as a matter of favor.

Mr. McLEAN. Then we do not disagree on that.

Mr. POWELL. That is a matter of United States law, and I would like you, gentlemen, to clear up this point if you can. If this original grant would carry the bed of the stream, could the State of New York, by any legislative act, divest that company of it, except by way of condemnation for public purposes? Are you agreed on that?

Mr. VAN KENNEN. I think so.

Mr. McLEAN. May I say this: The State of New York could divest the owner of the bed of this stream for a purpose which, under the statute, is a public purpose, such as a water plant, an electric light plant, or a plant of that kind; some public use.

Mr. POWELL. Then it would have to pay for it?

Mr. VAN KENNEN. Sure.

Mr. McLEAN. It could, for navigation purposes, take the land granted to this applicant without paying a cent. That was held in the South Bay Oyster Co. case, where the company in question held a charter from the King of England to the bed of the great South Bay and cultivated oysters. In that case, the Federal Government decided to dig a channel for the purposes of navigation through that oyster bed, and destroyed valuable rights, and they sued for the value of the oysters.

Mr. POWELL. That is a superior navigation right.

Mr. VAN KENNEN. Which we recognize.

Mr. POWELL. It is a well-recognized principle in the British dominions that the function of a legislature is not judicial, to interpret the law. Do you gentlemen agree that if the State of New York had no right there that no inference could be gathered from the fact that they have passed this enactment as to what the law actually was?

Mr. VAN KENNEN. I think that is our position.

Mr. MCLEAN. I do not understand Mr. Powell's question. But the United States Congress in the Wheeling case said that a bridge over a river was not an obstruction to navigation, although the Supreme Court had said it was an obstruction to navigation, and on return to the United States Supreme Court, they said: The Federal Congress has determined the fact that it is not an obstruction to navigation, and, therefore, it is not, and their decision is final.

Mr. POWELL. In that case, there was only a resolution of Congress; it never passed to the form of an act.

Mr. MCLEAN. Oh, yes it did; in that case.

Mr. POWELL. My point is this: Do you people in the United States recognize this, or do you deny the principle that the legislature has any judicial power of interpretation? Can the fact that the Legislature of New York passed these laws be taken as indicative in any way of what the law was with respect to the title to this stream?

Mr. VAN KENNEN. If I catch your meaning—the legislature has no power to define its own legislation; the courts have to determine that question.

Mr. MCLEAN. The legislature could pass a declaratory law?

Mr. VAN KENNEN. Certainly.

Mr. MIGNAULT. The only thing is that when the legislature passes what we know as a private act, it is not to be considered as having passed upon what is the general law. It gives certain privileges by a private act, but these are without any effect as overriding the general law.

ARGUMENT OF MR. FRANK H. KEEFER, K. C. (FOR THE DOMINION GOVERNMENT).

Mr. FRANK H. KEEFER, K. C. I think the commission is to be congratulated upon the fair manner in which my learned friend, Mr. Van Kennen, has presented this case all the way through. There has not been introduced anywhere a desire to exceed or take from any feature of the case as sometimes we have had experience of before this commission. Therefore, it is for the commission merely to determine the matter purely upon its merits and upon the law.

Mr. POWELL. I might in support of what you say state that I have never been connected with a case in which counsel exhibited more candor.

Mr. KEEFER. I wanted to refer to it because it is a pleasure to me to be associated in such a case. I wish now to associate myself with the remarks made by Mr. Mignault this morning, referring to the statements which have appeared in the public press condemnatory of this commission. I disagree entirely with the view set forth in some newspapers, that either branch of this commission should

take a one-sided view of any matter that comes before it and not look at it from an international point of view. In that regard I quite concur in what was said this morning by Mr. Mignault.

As regards the question of the title to the Little River and the waters therein, I do not intend to take up your time at all. I associate myself with all that my learned friend, Mr. McLean, has said in his able argument on that point. His submission, when you come to look into it, will, I believe, be found to be the law that is applicable to this case.

I would like to deal more generally with the merits of the case from an international point of view. It is perfectly clear from the evidence that has been adduced, that if this permission is to be given or to be confirmed by this commission, that compensatory works are necessary. We can not get away from that fact. The evidence of Mr. Stewart establishes that point. He told us that if 30,000 c. f. s. are taken down this river the effect thereof would be, even at that low stage of 229, to reduce the depth by 2 feet on the canal sill. Therefore, compensatory works are necessary, and that I think confirms this position: That any objection that heretofore Canada has made to these applications—and there has been some little private criticism as to that—the fact alone that navigation is interfered with justifies Canada in not agreeing to these projects heretofore, because in these other applications we have never had compensatory works proposed. In this case we have compensatory works proposed, and they are two in character. One is a dam between Canada Island and Ogden Island, and the other is a submerged weir. The dam between Canada Island and Ogden Island seems to be necessary, without question, so far as I can understand it—subject to correction by my learned friend, Mr. King, who represents the navigation interests.

Mr. KING. You have it.

Mr. KEEFER. I take it that irrespective of this case that dam would be quite a benefit to navigation, unless the effect of it on the current is detrimental to navigation, and I can not say as to that. The navigators have told us about that. But I would not like to see the commission carried off its feet, with respect to another part of the case, simply because the construction of that dam may be beneficial to navigation. I do not want the commission to reason that because of that therefore this application should be granted. The two things are separate and should be disassociated, the one from the other. If the navigation interests should apply to Canada—and as yet they never have done so—and ask for that dam to be constructed from Canada Island to Ogden Island in the interests of navigation, I am quite sure that Canada would erect that structure as an aid to navigation. But, so far as this power scheme is concerned the effect of that would be to restore, by virtue of a structure, two-tenths of the 2 feet that would be taken away by virtue of the diversion of 30,000 c. f. s. in the Little River. Two feet is gone and the proposition is to put a little of it back by virtue of this structure. There is no difference between Mr. Stewart and Mr. Lea upon that point. Mr. Van Kennen spoke of Mr. Stewart as being like an umpire in a baseball game, who when the pinch came gave his decision all the one way. Well, that is Mr. Stewart's duty. He is here

to look after navigation interests, not at the high-water stages, and not at the moderate stages, but at the pinches in navigation when the water is low. We have had the water down to that low level that has been referred to, and we may have it again, and it does not follow that because that might be circumvented some other way, that we should waive the point. The construction of a dam from Canada Island to Ogden Island may improve navigation, but it will not obviate the detriment to navigation which is caused by developing this 30,000 c. f. s. as asked for.

This is a very serious thing. I would like you, gentlemen, to realize that when you are dealing with the question of navigation you are not only sitting as Canadian judges dealing with Canadian interests, or as American judges dealing with American interests; you are neither one nor the other in this case, but, as regards navigation, you as Canadians have got to deal with the American interests of navigation on that stream, which are just the same as Canadian interests in navigation, the two being equal.

Mr. TAWNEY. Are you now speaking of the seriousness to navigation down the canal or down the channel, or both?

Mr. KEEFER. I am speaking of the seriousness to navigation on the St. Lawrence River, which would be down the river, or through the canal, because the two are interlocked. Mr. Stewart pointed out the fact that the water on the sill is a guide to those who want to run the river, and that if you have not 16 feet on the sill of Lock 24 you can not run through with anything drawing more than 14 feet. That applies to United States steamers as well as to Canadian steamers; it is not simply a domestic question with us. The United States have their rights in this stream. Canada, it is true, has spent the money in improving navigation here, and the United States has the benefit of that, and we certainly do feel that whenever we come forward with a proposition for the protection of the navigation of the St. Lawrence River, we will not only have the sentimental interest which we expect to have, but we will also have the practical interest of advocating something which is of benefit to the United States, because the rights of the United States in that navigation are equal to our own.

Now, the compensation that is proposed to try to relieve this unfortunate situation—unfortunate so far as this application is concerned—is a submerged weir, and Mr. Lea and Mr. Stewart have not agreed upon the effect of that. Mr. Lea, in his reexamination has not, in any way, contradicted Mr. Stewart's statement that this submerged weir would have to be built higher and brought up somewhere about 15 feet—15 feet or 17 feet; it makes no difference as to that for the purpose of my argument on this point. It has been shown that the river would have to be filled there in order to raise the water at the lock in low-water stages, so as to overcome that 2 feet of obstruction.

Now, fortunately that matter had to come before Canada, but if it has not, I would most strenuously urge you not to consider such a proposition. Why? What is the public policy of Canada? I do not need to give you evidence about that. You have seen our canal systems; you know that the lock system on the Soo Canal is 20 feet, and

you have been on the Welland Canal, where we are deepening it to 25 feet.

Mr. TAWNEY. Under Article VIII of the treaty the commission not only has the power to approve of any proposed obstruction in these boundary waters, but, as a condition of that approval, it may require the construction of additional remedial or protective works. Suppose that something in addition to that which is proposed by the applicants should be found by the commission to be necessary in order to compensate fully. Would there be any objection then, on the part of Canada, to the granting of the application?

Mr. KEEFER. It is absolutely impossible for me to answer that question.

Mr. TAWNEY. That is in the judgment of the commission.

Mr. KEEFER. I would answer you, then, that if the judgment of the commission conflicts with that of our engineers, we certainly will be guided by the judgment of our engineers. Because, under this treaty, our sovereign rights are not to be taken away from us.

Mr. TAWNEY. Certainly not.

Mr. KEEFER. We would have to be guided by our own advisers. That is the answer. And I threw out the suggestion at the beginning of this case that the proper way to approach the case was for the applicant first to have the consent of the Government of Canada. I said at the beginning of the case that in proceeding to take evidence, we were putting the cart before the horse. You may make an order, but we may have to refuse consent entirely. It would have been much better were the case started at the right end.

Mr. TAWNEY. At the same time, the decision of either Government as to what is necessary for the protection of the rights of the people on either side of the line, is not conclusive on this commission.

Mr. KEEFER. It is not.

Mr. TAWNEY. Notwithstanding the authority of the Government and the approval of the plans, the commission may require additional remedial or protective works, which the Government, in whose jurisdiction the obstruction has been authorized, has not approved of at all.

Mr. KEEFER. Then, supposing the Government deems these works inadvisable and refuses to permit the construction thereof, is there any authority for their construction?

Mr. TAWNEY. The question has to be determined whether authority for additional works is necessary or not.

Mr. KEEFER. The whole object of the International Joint Commission is to avoid international disputes, and here we are disputing on authority, which leaves the door decidedly wide open for another international dispute. You make an order which is not thought advisable in our interests of navigation, a dispute arises, which can be easily avoided if the applicants in this case would first apply to Canada and have refusal or acceptance, and then this commission can make its order. We certainly have got the cart before the horse when the application is first made to this commission. But that is not my business. I do not want to throw difficulties in the way of these applicants. I realize that they have considerable money invested in this property, and that they would like to get it out. Personally, I would like to see them get their money out; I do not want to interfere with the private rights of any citizen, nor does

my country, but the evidence is perfectly clear that this private right is only one-tenth part of the public right. The plan of power development that has been talked about in this application is 30,000 horsepower and the potential development there is 300,000 horsepower. I want to bring before you the public right as against this private right, and I am fully persuaded that you will pay just as much attention, if not more, to the public right as you will pay to private rights.

The two countries may differ on the question of policy regarding these public rights. We know what the policy of Canada is. We know what the policy of Ontario is, and in Ontario these lands are situated. We know that the development of our water powers by the Ontario hydroelectric commission is a live question in public affairs in Canada. It is one of the great outstanding features of public legislation in Ontario. Then, the Federal Government of Canada has declared its policy, and it has submitted to the United States, with reference to the St. Lawrence River, a proposal to immediately enter into the question of developing the powers on that river. It is a very, very vital question to us; we have a policy upon it, and I submit with all confidence that when this commission is convinced that there is a policy on this question, it will pay heed to that policy. It is now a public law; it has been made so by statute practically, by virtue of an order in council that has been passed recently, namely, that the development internationally in some way of this river should be immediately considered and taken in hand. Bear this in mind, that when I speak of that I am not opposed one iota to this company coming before you with a scheme to join across to the Canadian side for the complete development of the power on that river. We will join hands with anybody, whether it is a private individual on the American side, or whether it is a State Government or the Federal Government, to develop the entire power on that river, but on our side we know where the control will be. We in Canada will control our own power, and we will manage it here, and so we most strenuously object to any private piecemeal development of the power there. I submit to this commission that the people of Canada are very sensitive about any interference with any rights of Canada for the benefit of private individuals. I shall not argue the question whether that is right or wrong, but you, as international judges, must take that into consideration when you are dealing with the question; you can not ignore it.

Mr. TAWNEY. Carry your argument to its logical conclusion, and would it not result in absolutely defeating the purpose of the high contracting parties in making this treaty in so far as they have by the treaty authorized or created a tribunal for the purpose of passing upon every individual case of possible or potential power development within the boundary waters?

Mr. KEEFER. I would say no, absolutely, that it will not, and I will tell you why.

Mr. TAWNEY. Let me answer you that it would, in my judgment, and for this reason: Then the private owners or the people of both countries would be in exactly the same position they were in before this treaty was made.

Mr. KEEFER. We all agree with that.

Mr. TAWNEY. That is, they would have to wait until the two Governments, through diplomatic relations, could agree on some general plan, and that would necessarily involve delay. Industrial development in both countries would be retarded, and one of the purposes the treaty had in view was without delay to make provision for development, to the benefit of the people of both sides, of these various water powers, just as soon as whatever applicants brought forward their applications, with the authority of the Government within whose jurisdiction it was to be made, and secured the approval of this commission. If they had to wait now until the two Governments, through diplomatic negotiations, or otherwise, agree upon some joint scheme for power development, all along the boundary waters, that inevitably, in my judgment, defeats the purpose of the treaty.

Mr. KEEFER. I would take issue with you in this way: If the proposal of the applicants did not ask for any public domain of Canada, it is none of our funeral, and we could not object to them. On the contrary, I say with all sincerity that I do not think there has ever been given to this commission the power to give away the public domain of Canada. And that is what we took issue on in regard to the South Sault Channel.

Mr. TAWNEY. And the testimony of your own witnesses is that this development does not interfere with the development on either side of the boundary in the main channel. Then, what is the real purpose of this advocacy of delay?

Mr. KEEFER. Let me answer you—the testimony of the witnesses is clear that this work must be accompanied by compensatory works; you can not get on without them.

Mr. TAWNEY. No.

Mr. KEEFER. These compensatory works would be on the public domain of Canada. Now, if you are asking us to give up something that will injure our big development scheme, we will not do it. There is plain language for you.

Mr. TAWNEY. On the testimony of your own engineer, it will not require the Dominion of Canada to give up anything.

Mr. KEEFER. Yes, it does.

Mr. TAWNEY. It has nothing to give except its approval or authority for the construction.

Mr. KEEFER. It asks for a most vital thing, and you interrupted me when I was going to tell you why we object to the submerged weir. You must put the submerged weir in our channel, bringing the level to 15 feet. What is the effect of that? At present on a level of 14 feet a boat could get through drawing 15 feet.

Mr. TAWNEY. You are talking about navigation?

Mr. KEEFER. I am talking about navigation.

Mr. TAWNEY. We were speaking now about power development.

Mr. KEEFER. If they ask for power development on the other side which does not interfere with navigation or any of these things which are vital to Canada, then it is not our funeral, but when it does interfere with these things it is our funeral. There are applications here for piecemeal private development of the water powers of the St. Lawrence, and we want a full development.

Mr. TAWNEY. The high contracting parties decided that no development could be made on either side without affecting the levels

of the waters on the other side, and for that reason they appointed a tribunal to decide what the effect would be——

Mr. KEEFER. But, Mr. Tawney, suppose you have applications for a work which does not interfere with the level and is not detrimental to navigation, have you known of an instance where Canada came forward and objected? And when we do come forward and object, we ask for careful consideration of our views. Now, what is the point I am trying to make to you? You can not put this weir in without compensatory work. It may be that the compensating work you build at Canada Island is a benefit to navigation, but the other will be a detriment. We are looking forward to a great and growing trade in Canada; we are spending millions of dollars to get a 25-foot channel. We have had to stop our project during the war. You know all these facts. At the Welland Canal we have our locks half built to a depth of 25 feet, and even to a depth of 32 feet in the future, if that is considered necessary. You ask us to consent for a mere 30,000-horsepower development to put a weir in there that would bring the water up to 15 feet, and then when we put in a regulating dam we have to take that out again. We are brought here before this commission in regard to a picayune matter as compared with the great project which we have in view. We are pointing out to the commission that the applicants are asking of us something for their benefit which we do not think should be given to them, unless they come in and join us in some way, we care not how, for the complete scheme. Canada will not consent to any such proposition as is made here.

Mr. MIGNAULT. That quits the whole matter.

Mr. KEEFER. That quits the whole matter.

Mr. MIGNAULT. If, under Article III of the treaty, Canada does not allow this weir to be built, it can not be built.

Mr. KEEFER. And I frankly tell you that Canada will not consent to it.

Mr. MAGRATH. Of course, the applicants in this case are not like new applicants coming before the commission with an absolutely new scheme. These applicants have title extending back to 1808.

Mr. KEEFER. In making the statement I have made, do not think for a moment that Canada would be a party to being in the position of a dog in the manger. We do not want to deprive these gentlemen of what they have got, but when they come here and ask for more, we take a strong attitude against granting them that.

Mr. MAGRATH. You contend they are not entitled to the natural flow of the stream?

Mr. KEEFER. That is a matter which can much better be argued by Mr. McLean than by me. That is a domestic matter concerning the State of New York, and I do not think that I, as a Canadian counsel, should be called upon to interpret American law. If you ask me for my opinion of the matter, individually, as a Canadian counsel, I would say, as Mr. McLean has said, that whatever private rights these people have are subservient to the rights of navigation, and that when I urge that before you I am urging it for American citizens just as much as for our own citizens, because they have the same rights of navigation in that stream as we have. Therefore,

whatever title these people claim must be subservient to the rights of navigation.

Mr. TAWNEY. Suppose the commission should ultimately deem that some approval should be granted, and that it made this approval conditional upon the protection of the rights and interests of navigation, so that the work should not in any way interfere with or obstruct navigation, then what objection would you have?

Mr. KEEFER. May I give you another suggestion, Mr. Tawney—things are stirring very rapidly just now, and I have the conviction strong within me that it would not be a very difficult matter for these applicants to arrange with the United States and the State of New York for a charter by which they could get authority to develop the whole power of that river, and then let them come to us and we will join them. That is a solution of the matter, and it is a different solution altogether from an attempt on the part of this commission to make an order, and force us to assent to it.

Mr. TAWNEY. Nobody is trying to force you. The idea you suggest of a scheme for the development of 300,000 horsepower would require an investment of millions of dollars.

Mr. KEEFER. Are there not some others who would associate with them? I have been told that in three months that could be done. I have been told on very high authority that the American Government does wish a large plant of a certain nature built at that point, and it is only within a short time they have come to that conclusion. I think that is a wiser suggestion that the two countries should get together and adopt that large plan, than to have the commission make an order here in relation to which Canada will perhaps have to say no. We on our side are very anxious, and why are we anxious?

Mr. TAWNEY. How recently have you become anxious?

Mr. KEEFER. I will tell you how recently. When you are freezing to death you will begin to look about you for whence you can get heat. We are importing to-day—I got the figures from you, Mr. Magrath, 3,600,000 tons of anthracite coal from the United States, and 16,000,000 of bituminous coal. There are 300,000 horsepower at this point, and 1 horsepower is equal to 10 tons of coal per annum. Therefore, with thoroughly equipped machinery, there are 3,000,000 tons of coal being wasted every year that the power there is not developed. Do you think that the State of New York and the Province of Ontario, realizing that, have not got enough ability and energy, whether in private individuals or in the State itself, to grapple with such a problem as that and try to overcome that shortage of heat-producing elements which Mr. Magrath knows so much about, as fuel controller?

Mr. MAGRATH. I did not know what you wanted that information for.

Mr. TAWNEY. Now, Mr. Keefer.

Mr. KEEFER. I would like to be allowed to go on with my argument without interruption, Mr. Tawney. In the last power development case that was before you, we opposed that scheme very vigorously. There is 700,000 horsepower there, and on the same basis of 1 horsepower being equal to 10 tons of coal, 7,000,000 tons of coal

could be saved if we got power to develop that. There is 1,000,000 horsepower equal to 10,000,000 tons of coal.

Mr. TAWNEY. That was all known when the submission of the United States was put before Canada for the purpose of investigation.

Mr. KEEFER. When the public realizes that, when our Parliament realizes that, when the conservation commission of the State of New York realizes that, there will be no difficulty in getting that development. These gentlemen who are making the application here will, they say, get 5 feet more head, and they will be benefitted by it. They can afford to wait a while yet and probably look around for additional people to join them and come forward with a big scheme which would provide for the development of 300,000 horsepower at that place, instead of the little picayune transaction like this, wasting our time for the last three days about 30,000 horsepower, when we have such a big scheme in front of us. These are the points that I would like you, gentlemen, to look at.

Mr. TAWNEY. So long as the development of this power does not detract in the least from the development of power under the main scheme, why ought there be delay?

Mr. KEEFER. It does detract from it; have I not made myself clear?

Mr. TAWNEY. I am referring now to the testimony.

Mr. KEEFER. So am I.

Mr. TAWNEY. Mr. Stewart says——

Mr. KEEFER. Mr. Stewart's evidence is plain upon that point. You have before you in this problem on the one hand the private interests which I am not wanting to hurt; you have the private interests asking for one-tenth of the potentiality of that river, and on the other hand you have before you, for consideration in the public interest, the potential development of 300,000 horsepower, and also the regulation of Lake Ontario, which will benefit all the powers below and improve navigation.

Mr. TAWNEY. We have no proposition of that kind before us.

Mr. KEEFER. No, but Canada has these things in contemplation, and we want to get your sympathy for these projects.

Mr. TAWNEY. Canada may have these propositions to make, but they are in no concrete shape in contradistinction to the scheme that is now before us.

Mr. KEEFER. If the projects contemplated by Canada conflict with a private scheme like this, and we have testimony that this scheme does conflict with them—then that is sufficient to stop this matter. The evidence is that you can not take 30,000 c. f. s. from that stream without reducing the water 2 feet. And how are you going to restore that water? Canada has spent millions in maintaining the present status quo of water for navigation. Is all that to be swept aside simply because some one wants to develop 30,000 horsepower immediately? I was not present at the time. but I saw it stated in the press that Mr. Tucker had said that he did not contemplate the development here until after the war. He told the commission how difficult it was to get plant, and machinery, and several other things, but he applies now to get authority for this work which can be obtained later on just as well. You must realize that even if you make an order to-morrow this scheme has to wait. Then, I say, let this

private scheme wait a bit longer until the big development scheme is proposed. Mr. Tawney seems to think that is impossible; I know it is not.

Mr. TAWNEY. I am judging of the future by the past.

Mr. KEEFER. Well the past is changing very much.

Mr. TAWNEY. I did not know until two months ago that the Government of Canada had before them a request from the Government of the United States to join them in a proposition for the investigation by this tribunal, or some tribunal, of the whole question of the development of power and the improvement of navigation in these waters, and although that request has been before the Government of Canada since 1914——

Mr. KEEFER. Every time this commission sits that matter is referred to.

Mr. TAWNEY. Only twice, once in Montreal and once here now.

Mr. KEEFER. And I will answer it now. That application came in from the United States, expressing its willingness to deal with the matter of navigation from the head of the Lakes to the sea. The matter was in the hands of the prime minister, our minister of external affairs, and he was considering certain questions to be submitted when the war broke out. I think you will remember that in the first two years of the war we had some difficult questions to determine in regard to international rights, arising out of neutrality, and so forth, and with regard to the right of transporting vessels, and one thing or another, and we were afraid to be found bringing war material into Canada because of the then great German influence in the United States. But that has all changed. We have had other matters to deal with, involving the very life of the nation, since the war broke out. But just as soon as may be, that question will be taken up by the Canadian Government and dealt with. That question will be dealt with just as rapidly as it can be dealt with when the war is over. But during the last three or four years we have had other fish to fry.

Mr. TAWNEY. Do not understand me as criticizing the Canadian Government for not having acted.

Mr. KEEFER. I have given that as an explanation of your remarks.

Mr. TAWNEY. Since these two cases have come before the commission for consideration, this sudden desire on the part of Canada for general investigation or improvement is what I say I can not understand.

Mr. KEEFER. We have not exhibited any sudden desire for investigation, but we have exhibited a sudden desire and a strong desire not to have these natural resources handed over to private companies, and that is why we opposed the Long Sault Development application. We did not like the suddenness with which that was sprung upon us, after holding the thing up for some time, and then suddenly bringing it forward as a war measure. So we think we are giving you a war measure now, when we propose the immediate development of this whole power scheme, and you can have your Roland for your Oliver—I do not know which you would like best. But, these are the facts. I want you to realize that this case is presented to you upside down. The proper way to go about it is to submit the proposed compensatory works to the Federal Government of Canada and get

their approval, subject to the authorization of this commission, and then there will be very litle difficulty. In the meantime we point out these serious objections to the application.

Mr. TAWNEY. If the applicant has the consent of his own Government he can submit that proposition to us.

Mr. KEEFER. I am not questioning that. As a matter of fact, the matter has not been properly approved of. As Judge Koonce points out, it has just been sent here.

Mr. VAN KENNEN. We were sent here.

Mr. KEEFER. We will accept the explanation that you were sent here, and I say that the works that relate to Canada should be submitted to our Government and approved of.

Mr. MIGNAULT. That is absolutely so.

Mr. KEEFER. There is no question of that.

Mr. MIGNAULT. The treaty provides for it.

Mr. KEEFER. It provides for it in several different parts.

Mr. POWELL. What particular part?

Mr. KEEFER. The very wording of section 3 provides for it.

Mr. MIGNAULT. That is an essential requirement of the treaty.

Mr. TAWNEY. Certainly.

Mr. MIGNAULT. Just as essential as our approval:

> No further or other uses or obstructions or diversions, whether temporary or permanent, of boundary waters on either side of the line, affecting the natural level or flow of boundary waters on the other side of the line, shall be made except by authority of the United States or the Dominion of Canada within their respective jurisdiction, and with the approval, as hereinafter provided, of a joint commission to be known as the International Joint Commission.

If it only relates to the United States their consent is sufficient, but as it relates to our side also, the wording is significant.

Mr. POWELL. That does not say "the United States and the Dominion of Canada"; it says "or"; it is either one or the other.

Mr. KEEFER. It says it shall not be done except by authority of the United States or the Dominion of Canada, within their respective jurisdiction and with the approval of the joint commission.

Mr. POWELL. Let us look at that; I have a pretty strong opinion on that. I may be absolutely wrong, but my opinion is very strong, and it appears to me that these two peoples agree to put themselves in this position in which neither one can play dog in the manger, and if one wants to put in a work on one side of the line which injures the other, it shall be referred to this commission to say whether that work is to go ahead or not, because, if it required in all these matters a union of the two peoples to do it, why they never need constitute a commission at all. And to my mind, if one side goes to work and authorizes an undertaking on its side, and it is necessary to give full force to that undertaking to have certain works on the other side of the river, they apply to us to whom both peoples have delegated the power to deal with it. You look at section 8 and you will find that compensation can be made for any injuries done on either side.

Mr. KEEFER. Compensatory works are provided for, but does section 3 apply to one side or to both sides?

Mr. POWELL. In the first place, if Canada wants to go ahead with a work, the proper thing for Canada to do is to get it authorized within Canada to start with, and then Canada comes to this commission, and this commission can force it upon the United States.

Mr. KEEFER. I would not take that ground.

Mr. POWELL. Otherwise, there is no use in this agreement.

Mr. KEEFER. Then the sovereign power has been handed over to you.

Mr. POWELL. I think it has to that extent.

Mr. MIGNAULT. If the work is to be done within the territory of one of the countries, it must receive the approval of that country, and then the matter is referred to the International Joint Commission to protect the international interests.

Mr. TAWNEY. The primary object here is to put in a dam, and if as the consequence of putting in that dam there is injury on the other side, then arises the question of remedial works. Furthermore, we need not only provide for putting in remedial work, but we provide for compensation.

Mr. KEEFER. Article 2 says—

II. Each of the high contracting parties reserves to itself or to the several State Governments on the one side and the Dominion or Provincial Governments on the other as the case may be, subject to any treaty provisions now existing with respect thereto, the exclusive jurisdiction and control over the use and diversion, whether temporary or permanent, of all waters on its own side of the line which in their natural channels would flow across the boundary or into boundary waters.

I do not think we have ever given up the exclusive jurisdiction that each country has on its own side. But, if it wants to do anything on that side that interferes with the other side, it has to come here for approval.

Mr. POWELL. That section of the treaty is not as you state, because you have the idea that it requires the conjunction of the two countries.

Mr. KEEFER. I have tried for hours to get a different interpretation out of the section from that which I have stated, and my opinion on the matter is the result of study.

Mr. Van Kennen made some remarks which I thought were correct regarding the policy on this side of the line at Niagara Falls, and how we were endeavoring to get the most efficiency out of that water power. He commended our efforts in that direction. He pointed out the other policy that was pursued on the American side. There is a development at the crest of the falls there on the Canadian side also, and millions has been spent on that. But to-day the Ontario Government is spending more millions to build a canal down to Queenstown from Chippewa with the ultimate intention of scrapping all these millions that have been spent at the Falls, in order to get a full head and a full development. If that is to be commended, and from the experience of the past we know that it is, then why should not the same principle be applied here? How inadvisable it would be in the public interest that private interests should be allowed to go ahead with this matter hurriedly, when with a little more careful consideration we can come before this commission with a scheme completed, which everyone could support.

Mr. VAN KENNEN. If we eliminate the weir, what then?

Mr. KEEFER. You can not eliminate the weir without a loss of 2 feet at the locks.

Mr. VAN KENNEN. Then, of course, you can not consent to the lowering of the water.

Mr. KEEFER. No.

Mr. VAN KENNEN. You could not, of course.

Mr. KEEFER. You have put it quite right; I could not consent. It is not that we do not want to give you assistance.

Mr. VAN KENNEN. Then, if you want to give us assistance, tell us what we are to do. Are we to do nothing?

Mr. KEEFER. I have thrown out the suggestion that you should come forward with a bigger scheme.

Mr. VAN KENNEN. Oh, you know it is impossible to carry out that suggestion of yours.

Mr. KEEFER. If you can not do that, then we should not sacrifice our bigger scheme to give you a small scheme.

Mr. VAN KENNEN. The bigger scheme works in with ours.

Mr. KEEFER. Notwithstanding the eminence of Mr. Lea, notwithstanding his ability, we must never contemplate putting in jeopardy the navigation of the St. Lawrence River upon an opinion. If you go to work and you take 30,000 c. f. s. out of that river, you are going to get into difficulties, beyond all question. Mr. Lea theorizes and says that you might build a submerged weir that would restore that and not impede navigation. The engineers differ about that; they fundamentally differ. What are you going to do about it? You have the opinion of the engineer of the company, and you have the opinion of the engineer of the Government, who has no ax to grind except to speak in the public interest. These are problems that you, gentlemen, as judges, not as sympathetic hearers, should take into consideration. It may be that the refusal of this application will hurt the applicants, but I can not help that. I feel sorry for them, but I can not neglect my public duties, and neither can this commission neglect theirs, and they know that the public sentiment in this country is in favor of protecting public rights and asserting public rights as against private gain. I can not offer any suggestion except the one I have offered, and I am sorry that is not acceptable to the applicants.

Mr. VAN KENNEN. It would be impossible to accept it, or to carry it into effect.

Mr. KEEFER. Then I am sorry to have to tell you that if you need compensatory works, and you come to Canada with a proposal to put in a submerged weir there, that we have a clear definite policy of a deep waterway to the sea on which we have spent millions, and can we be asked to consent, for the sake of developing 30,000 horsepower, to jeopardize that? I ask you if it would be common sense for Canada to consent to any such thing.

Mr. TAWNEY. Your submission is to defeat the purpose of the treaty.

Mr. KEEFER. It is not. We assume that the purpose of the treaty was to avoid international disputes, and we thought the judges dealing with this question would take into consideration our views on these points, and not look on them as tending to defeat the treaty.

Mr. TAWNEY. You say you concede that these applicants have the right to use the natural flow of the Little River?

Mr. KEEFER. I do not, and certainly not if it interferes with navigation. Whatever rights they have there are subservient to the

interests of navigation. If they can use that natural flow and not interfere with navigation, it is a different matter.

Mr. TAWNEY. Suppose they were to remove the artificial obstruction in the Little River, so that the natural flow would be increased, could you object to that?

Mr. KEEFER. Yes.

Mr. VAN KENNEN. Suppose we took away our dam there.

Mr. KEEFER. I think if you undertook to blow that out, the United States and ourselves would call upon you——

Mr. VAN KENNEN. Never mind the United States.

Mr. KEEFER. We would ask the United States to put it back.

Mr. VAN KENNEN. Oh, pshaw.

Mr. KEEFER. Yes; oh, pshaw. In the first place the rights that these people have, as Mr. McLean has pointed out, are absolutely subservient to the Federal rights of navigation. Now, after millions of dollars have been spent in building canals on the Canadian side, and recognized the status quo of this dam, and if anything were done to change the status quo of that dam which has been in existence ever since these locks were built, and which would interfere with navigation, it is a nice legal question whether they could do it. I rather think they would be estopped from doing it.

Mr. POWELL. A stronger point in your favor is Article VIII of the treaty itself, which in reference to the uses of water provides that it shall not interfere with navigation, including the service of canals for the purpose of navigation.

Mr. MAGRATH. As a citizen of this country, I am delighted to hear that the Government contemplates an aggressive public policy in connection with the development of the water powers, but at the same time it appears to me that your policy is not very clear-cut yet.

Mr. KEEFER. It could not be.

Mr. MAGRATH. And to undertake to say to these applicants, you must stand back until the country is ready with its own policy, is not fair.

Mr. KEEFER. We can not say to these applicants you must stand back until Canada is ready, but we can say to these applicants, and properly say, if you ask us to surrender the public domain for your benefit, we can not do it. That is a different proposition.

Mr. TAWNEY. That is drawing on your imagination to make that statement.

Mr. KEEFER. I am afraid that anything I may say will impress you as being imaginary, but I am sincere in it.

Mr. POWELL. I read Article VIII:

> This International Joint Commission shall have jurisdiction over and shall pass upon all cases involving the use or obstruction or diversion of the waters with respect to which, under Articles III and IV of this treaty, the approval of this commission is required, and in passing upon such cases the commission shall be governed by the following rules or principles, which are adopted by the high contracting parties for this purpose:
>
> The high contracting parties shall have, each on its own side of the boundary, equal and similar rights in the use of the waters hereinbefore defined as boundary waters.
>
> The following order of precedence shall be observed among the various uses enumerated hereinafter for these waters, and no use shall be permitted which tends materially to conflict with or restrain any other use which is given preference over in this order of precedence.

That is pretty strong language.

Mr. MIGNAULT. It is conclusive. The whole difficulty is the weir, and the weir would obstruct navigation, and that is the end of it.

Mr. KEEFER. There is no question about it in my mind.

Mr. VAN KENNEN. We don't want the weir, if that is the point.

Mr. MIGNAULT. It would obstruct 25-foot navigation.

Mr. KEEFER. It would even obstruct it on the present basis at low-water stages, because, in order to avoid a block, that weir must be built wide, as I understand the testimony. And if the weir is built, as it is proposed to be built, in low-water stages, you are going to have trouble.

There is another important consideration in connection with navigation, which I want to impress upon the commission. To-day boats can come up that river. Put in that weir and then, for boats with 15-foot draft, our navigation is stopped completely up the river. True, it is only the smaller boats that come up, but are you going to bar the river to these small boats and make them go through the canal, which entails some hours longer of their valuable time? That certainly is an important consideration.

Mr. POWELL. There is one thing that is in line in supporting what you ask, and that is that it takes speedy boats to go through that channel with the additional water rushing through it.

Mr. KEEFER. What worries me is that we will have to face the difficulty of increasing the speed of the river from 7 to 9 feet, that we will have to face the submerged weir difficulty, and probably other difficulties which we do not guess at now, but which we will find out by experience. When we have these facts staring us in the face, why should we be so terribly anxious to put in a 30,000-horsepower development? Why should the commission want to be so generous?

Mr. MAGRATH. This is not a question of generosity.

Mr. GARDNER. I want to know what justification you can have for the statement that this commission is anxious to do this?

Mr. KEEFER. I did not mean it in that sense. Please let me correct myself. I have been anxious and all of have been anxious——

Mr. GARDNER. I do not want you or anyone else to come before this commission and tell me what I am anxious to do or what I contemplate doing.

Mr. KEEFER. I am aware of that. And why should you, I, or anybody else be anxious where the private interests are concerned, to allow them to take this 30,000-horsepower development and injure navigation?

Mr. GARDNER. If I am not competent to form my own judgment as to what I should do, I have no right to be on this commission at all. I can form my own judgment without being instructed upon it.

Mr. POWELL. It is not a question of anxiety at all. Here are people who have the power, and they want to develop it, and as against that you suggest something problematical which is contingent upon the happening of certain things, which may never happen. I agree with you that it is lamentable that that power has not been developed, and it should be developed immediately. But here are people who have a proposal on hand, who want the development to take place and realize on their investment.

Mr. KEEFER. I am as anxious as anybody else to see this development going on. I have had several talks with Mr. Connolly in regard to the matter. I think I am perhaps more anxious than any of you gentlemen are to see that the development of the power there is not interfered with.

Mr. POWELL. Your statement was that you could not see why the commission was so anxious to grant the application of this company. I take it that you meant nothing offensive in that statement.

Mr. KEEFER. Oh, certainly not. At all events, this application if granted would seriously affect navigation interests on the St. Lawrence River, and as to that you have only to refer to the report of the Montreal water levels commission, and on top of that you have the testimony from Mr. Lea himself, the applicant's witness, that the Ontario hydroelectric commission have a staff in the field to-day making surveys for the development of this power.

Mr. POWELL. How would this suggestion meet with your approval. These gentlemen say they do not want to go ahead with this for a couple of years, or until the war is over and the money market is less stringent. Suppose in the order we would make a provision like this: That this work should not be undertaken for the space of two or three years, and if in the meantime a general scheme was adopted that the order should not be operative, or some such provision as that.

Mr. KEEFER. You are asking too much of me as counsel, to answer that question.

Mr. POWELL. It does not seem fair that you should take the attitude you do.

Mr. KEEFER. What I am pointing out is, that as the application is launched it must in the end receive the approbation of the public works department of Canada, and I do not think for a moment that the public works department will consent to these compensatory works.

Mr. POWELL. I keep in reserve my opinion as to the power of the commission to deal with a matter like this when it is submitted by one Government, and when the other Government objects.

Mr. KEEFER. Instead of talking about two years, I think if my friend, Mr. Connolly, and myself bend our energies to this problem that within three months we can submit to you a better project than is submitted to you to-day.

ARGUMENT OF MR. FRANCIS KING (FOR DOMINION MARINE ASSOCIATION).

Mr. KING (Dominion Marine Association). I am sorry that the statement I have to make at the outset seems liable to launch us immediately into some further discussion of the problem raised by Mr. Tawney, and discussed by the other members of the commission. But it is my duty on behalf of the Dominion Marine Association to reiterate once again the settled conviction—so clearly and concisely embodied in the answer given by Mr. Stewart to the question I put to him yesterday—that as between these two methods of development, one by developing power and incidentally protecting navigation, the other by developing the river with a primary regard to the

paramount interests of navigation, with such incidental development of power as the country needs and will be possible under the circumstances, there is no question whatever that the right and proper way is to deal with this from the point of view of navigation first, and power second. There is no use elaborating that point. The treaty, as quoted by Mr. Powell, and the order of precedence mentioned in it, point to the fact that navigation is paramount.

Mr. POWELL. It is in the treaty, and that is simply declaratory of the common law.

Mr. KING. Clearly; and for that reason I need not say another word about it. Having once more laid that view of the Dominion Marine Association before this tribunal, I do not see that the argument advanced by Mr. Keefer, an argument in which I join, in so far as it deals with the necessity for developing power, and the paramount need of protection of the rights of navigation, is at all inconsistent with the expressed views of certain members of the commission.

Mr. TAWNEY. To the effect that power must be developed?

Mr. KING. The commission must perform its functions and must hear applications and may decide in many cases to allow development of power with due compensatory works to protect navigation; but these two things are not inconsistent. There is a tremendous field of development apart from the special district under consideration. Cases are innumerable in which the commission may with absolute freedom apply itself to the questions laid before it, and allow development to take place and at the same time protect navigation. But I do say that having regard to the preamble of the treaty; having regard to Section III of the treaty; construing it, not as Mr. Powell construes it, but in the other way, that where the works extend across the river into both countries, then the approval of both Governments becomes necessary——

Mr. POWELL. Do not misunderstand me; what I say is that where the primary object is initiated on one side, that it must have the full and complete authority from that side, in some way. Now, if as a necessary consequence of that, and in order to carry that out, they require remedial works on the other side; that is the case I have in mind.

Mr. KING. That limits a little what I understood to be in the first instance the effect of Mr. Powell's contention. I go this much further in my reading of the treaty, and I think I concur in Mr. Keefer's view; that where the remedial works, or any part of the undertaking, encroaches on both sides of the river, that the proper proceeding, before the commission is asked to deal with the matter, is to ascertain whether or not the Governments of both countries are willing that the work should be undertaken. I say this: That there never has come before the commission a more clearly cut case in which the Governments of both countries should be approached and their views ascertained, before the commission should bother with the question.

Mr. POWELL. Do not understand me to say that I think, within that principle, that this application should be granted. I am simply speaking in the abstract of the powers of the commission. I did not direct my remarks to this particular case in any way.

Mr. KING. What I am intending to do is not so much to enter into an argument of that main question, as to justify to some extent in this case, more than in any other in which I have had the honor to appear before the commission, the application of the principle which I have advanced here as to the propriety of approaching both Governments through the proper departments, before approaching this commission. Then I add that when one of the two countries, through counsel in addressing the commission, has stated that it is the desire of that country to develop this particular section in a way which it is now intending to seriously consider, I think the commission could very well say that while adopting as a main principle that which most of the commissioners have expressed, namely, that they must try to assist the applicant where they can, and not defer matters because of some nebulous proposition, yet where one of the two nations anounces its intention of doing in a certain well-defined district what the Dominion Marine Association has asked for years, then consideration should be given to that, and the immediate proposition of a single applicant, of a private corporation, should be deferred pending consideration by both countries of the more general scheme.

Before I take up, as I want to do, the two or three questions in solving which I say navigation is seriously interfered with, I want to make a reference to two or three of the points which do not fall particularly within my province, but on which I wish to say a word. Mr. Stewart in his evidence referred to the probability of the building of a dam, as part of any proposed larger work, perhaps in the neighborhood of Canada Island. In that connection, as well as in the statement in reply filed by the Dominion of Canada, it was pointed out that such a dam would raise the water only about 5 feet at the head of Ogden Island. There can be no question, therefore, but that the proposed submerged weir will, under these conditions, be a very serious menace to navigation; for navigation under the larger scheme would require a 30-foot channel and there would not be 20 feet above this submerged weir. I shall refer more particularly to this weir later on.

Another point in Mr. Stewart's evidence, which has not been sufficiently spoken of, is this 2-foot reduction in the level on the sill of Lock 24 which has an important bearing in connection with a point made by Mr. Van Kennen. Mr. Van Kennen, on behalf of the applicants has rather suggested that inasmuch as there were certain vested rights in the applicants with regard to the natural flow of the Little River, it would be quite natural for Canada to now submit to a reduction in whatever water there is over the sill of Lock 24, without complaint, because the water which is now to be taken into the Little River belongs to Mr. Van Kennen's clients, or rather that it used to belong to Mr. Van Kennen's clients. I want to point out in that respect that it should not be overlooked that the applicants have not been using that water, that the locks and canals on the Canadian side were built years and years ago with regard to an intended depth of water over the sill of Lock 24, which the evidence shows, or rather which evidence I have in my mind shows, was identical or almost identical in 1860 with what it is to-day. If anything, to-day we have lost a little bit in the water over the sill of

Lock 24, as compared with what we had in the year 1860. With the permission of the commission I may hand in that statement, copied from the records, showing how the water stood in every year, from that year down.

Mr. VAN KENNEN. I would like to see that.

Mr. KING. I will hand it in; subject, of course, to Mr. Van Kennen's consent.

Mr. VAN KENNEN. I object to that. My engineers are gone and they should know what this is.

Mr. KING. The records are public and can be obtained elsewhere.

Mr. VAN KENNEN. If they are public records, I suppose you could read them.

Mr. KING. The point I am making is that we have enjoyed since the beginning of the making of the records, as much water over the sill of Lock 24 as we have to-day, and that the contention that we have been gradually getting a little more water over the sill of Lock 24, because of this lessened use of the Little River, is wrong. I would also suggest to the commission that even if these parties had certain rights in the use of the water in the Little River, if they have not done anything to use that water while Canada has built the canal for the general use of the public of both countries, and the enlargement of these canals has continued and they have been used under certain conditions for a very long period of time, the question of estoppal comes in; and it would hardly be competent for the applicants to come forward at this stage and say that this water which has been used for a very long period to the advantage of all parties, our neighbors across the line as well as ourselves, is the property of the applicants as a matter of right. I say that because Mr. Van Kennen in his argument laid emphasis on their absolute right.

Mr. POWELL. Do I understand you as putting forward the principle that the lapse of time has made the owners of this water power responsible for any kind of conservation of navigation on this side?

Mr. KING. Yes; in part. That matter is an international question, anyway.

Mr. POWELL. Were they all private parties that principle would be applicable.

Mr. KING. Absolutely so; and I would not hesitate to advance that view as between private parties. I do not think the commission should overlook that in considering the question.

Mr. POWELL. I would like to be supplied with authorities on that line, because it has been running in my mind. The fact strikes me as significant that the United States and Canada have entered into an agreement in 1909 for the use of this canal, and might it not be said that that use is on the basis of the status of the canal at the time the agreement was made.

Mr. KING. Surely. I want to say now that I have no intention whatever of entering into any argument on the question of title or ownership or natural flow of the stream, leaving that to the gentlemen who have made a special study of it, and within whose province it falls. I associate myself with what has been said by Mr. McLean and others opposed to the application, in that respect.

I am left with the question of navigation particularly, and as to that I want to say that the more the proposition is "sicklied o'er

with the pale cast of thought," the more my clients would prefer to "bear those ills they have than fly to others they know not of." That would not be enough to say to the commission, by any means, in opposing this project. I believe the commission itself feels that navigation is definitely interfered with by the proposal of the applicant. Let me say in the first place that where a private corporation comes forward and asks for the right of developing power, and asks for that purpose a bit of the public domain, navigation must be protected. The compensatory works must be really compensating, and if there is a doubt as to whether or not they are compensating, that doubt must be solved in favor of navigation in the largest sense. I do not think the commission would have any right to say: You may do this or you may do that, and we *think* the compensatory works proposed will be sufficient to protect navigation. If that were done; if Mr. Tawney's suggestion made yesterday were adopted, there undoubtedly would have to be carried out in the minutest details a close supervision and an enforcement of conditions imposed by the order that would protect the interests of navigation from the first instant the work commences and for all time thereafter, and constantly permit reestablishment of the *status quo ante*. I want to mention that particularly at this juncture, but I do not want to cross that bridge until I have to.

I want to say now that I do not agree with Mr. Keefer when we begin at the bottom end of this section of the river and refer to the embankment from Ogden Island to Canada Island. In the course of the examination, which unfortunately he did not hear because he was otherwise engaged, he made the statement that he understood there was no objection to that embankment from the navigation point of view. Unhesitatingly, I say that as to downstream navigation I do not think that embankment would do any harm to anyone navigating the River St. Lawrence, and it might in some way facilitate matters for ships in helping them against any side water, but as to upbound navigation——

Mr. KEEFER. I quite agree with what you say.

Mr. KING. But as to upbound navigation the evidence of Capt. Batten, a man of experience, is before the commission—he is the leading captain of the Canada Steamship Line in charge of their passenger boats on the River St. Lawrence between Prescott and Montreal——

Mr. TAWNEY. How many passenger boats go up there?

Mr. KING. Three, the *Rapids King*, the *Rapids Queen*, and the *Rapids Prince*.

Mr. TAWNEY. No freight boats?

Mr. KING. No freight boats except, of course, tugs.

Mr. TAWNEY. There are no freight boats going up?

Mr. KING. No; these three passenger boats are what I am speaking of. What I am referring to now is these three passenger boats in connection with upbound navigation, and these three boats accommodate the tourist travel of Canada and the United States, and go up and down. These boats are capable of carrying the full complement of passengers of the big lake boats which run from Toronto to Prescott and there transfer their passengers to these boats. In addition to these three boats, which are practically the only boats with

which I am concerned on this particular point, there are tugs without tows, and these are the only boats that would be able to navigate upstream. It has been said that a high-power freight boat, rather small, has tried it successfully, but that is of no great importance for my present argument. It is only with the passenger boats and the tugs without tows that I am concerned in this special respect and the evidence as to that is that if this project were allowed these boats would not be able to get upstream. Capt. Batten has described the way in which he has to get up now, and a clear understanding of that is essential to an understanding of this special point I am making. A navigator does not attempt to stem the current. He tries to evade it; and he does that by seeking the slack water and the eddies, found toward the shore below the points or convex curves of the bank. At Canada Island the upbound boat keeps as close as possible to the island for this reason, and then losing the slack water strikes over to the opposite side of the river to find it again there. While crossing the boat is swept down by the current and sometimes fails to reach its objective and is compelled to make a fresh start and try again. Capt. Batten swears that one of his steamers, with an ordinary speed of 13 miles an hour, has stood still, unable to make any headway, when by mischance she has been swung head-on to the current abreast of Canada Island, and I think there is evidence that in the slack water such a boat does not make more than 2 miles an hour past Canada Island.

Now, the evidence of Mr. Lea, the consulting engineer for the applicants, was clear and definite that the current past Canada Island, if the proposals of the applicants are carried out, will be half as much again as at present—in his own figures 6 will become 9. Capt. Batten's evidence is positive that with this increase his steamers will be barred from upstream navigation, and his statement does not seem open to contradiction. The navigation witnesses for the applicants confined their attention to the alleged gravity of the supposed menace to navigation in the cross current between Ogden and Canada Islands, which this embankment will remove, and to the benefits which accrue to downstream navigation at this point. One of them got beyond his depth in attempting any reference to the other works; misunderstood the submerged weir, and thought the 30,000 cubic feet diverted into the Little River would not alter the depth in the Rapide Plat. The other, perhaps wisely, refused to discuss anything but this embankment and its benefits to downbound boats. There is no substantial contradiction of Capt. Batten. Mr. Lea, it is true, suggested that as the new current north of Canada Island will not be so strong as it is at certain points in the Rapide Plat at present, the boats will get up all right. The answer to this is that the boats do not fight the current but dodge it, seeking the slack water; and, sometimes, in the Rapide Plat, failing to do that. The probable effect of the embankment will be to throw the current toward the north or canal bank and do away with any slack water there, thus removing the steamer's chance to get up on that shore after running across from Canada Island.

A member of the commission then suggests that these boats might canal up. The answer to that is that the evidence shows the canal time upbound of an hour and a half as against 45 minutes in the river

going up; and that the boats are all running on a close schedule to make the necessary connection at Prescott and so that the trips up and down bound may have daylight when required at certain sections of the river. Furthermore, the same argument applies to tugs going up without tows; and as to all these boats now enjoying an available channel upstream if the canal is blocked or out of commission it does not appear to be consistent with the rights of navigation to bar this channel.

So much for this embankment from Ogden to Canada Island. I want to be perfectly frank and perfectly fair. I can not see that it will do any harm to downbound navigation and it may do some good. But as to upbound river navigation, I thing it will be barred. Only one more statement I must make about it and that will refer to Mr. Van Kennen's unfortunate remark that this shoal where the embankment is to be built is now the graveyard of the St. Lawrence.

Mr. MAGRATH. Mr. Van Kennen wants to withdraw that.

Mr. VAN KENNEN. No, sir; I don't want to withdraw it.

Mr. KING. Then I shall have to say a little more on that subject. There has not been one jot or tittle of evidence given here to show that a single boat ever went on the bottom between Ogden Island and Canada Island, unless by reason of some defect in her machinery, defective steering gear, or a broken towline. Becoming disabled, boats naturally take bottom at this place, but build the embankment and the disabled boats will simply take bottom somewhere else.

Then dealing wih the Rapide Plat. The evidence seems to be that it will be slightly improved at certain "critical" stages in the river—perhaps to the extent of 3 to 5 inches in available depth of water, and that at low stages it will lose perhaps an inch of depth. Mr. Lea also thinks the "pitch" will be eliminated. I find it difficult to say much about this, and I base no argument against the scheme in this respect. But I do take this opportunity to combat in the strongest and most emphatic manner Mr. Lea's contention that he need only be concerned with what he calls a "critical" stage of the river when the depth comes down to 14 feet in the Rapide Plat. There is no fixed draft of 14 feet for the boats. Barges capable of drawing 14 feet, and unable for reasons explained in evidence to make the canal entrance downbound, have run this rapid at 12 feet in low-water seasons. They have lightered to a draft to suit this rapid and the existing stage of the river; and after lightering they have been held back by loss of depth due to wind. Many barges draw as little as 9 feet or 7 feet, and all these boats have a "critical stage" not dreamed of in Mr. Lea's philosophy. It is also a mistake to imagine a boat only feels the loss of an inch of available water when her keel gets down to bottom. If she is an inch nearer the lowest bottom at any stage she is an inch nearer any one of the countless obstructions she may strike. And in the same way, it is a mistake to allow only for a canal sill. The canal bottom and its shelving banks must be considered throughout its whole length; and it is not fair to say that because, for instance, a boat will touch at a poor lock like Lock 15, no account need to be taken of lesser difficulties elsewhere.

But coming back to these compensating works which I say do not compensate, we reach the submerged weir at the head of this section of the river. Let me point out that no definite description of it has been given. At the outset it was a very sketchy affair. At Atlantic City Mr. Lea treated it with an "airy fairy" touch and in a very light and fantastic manner. He thought, in fact, it would not be required at all, but it would be a good dumping place for his excavated material. Then in his evidence here in Ottawa he gave it a possible width up and down stream of perhaps 500 feet; and, after cross-examination as to the "pitch" of 1.53 inches at its lower edge, he lengthened it to a possible 1,000 feet in addition to its slopes, and gave it considerable incline down stream to avoid this "pitch." The impression remained that as Mr. Stewart's evidence gave only 15 and a fraction feet of water over the crest of this weir, and its purpose was to make good a necessary net loss of level of 1.53 feet in the water farther up, it would either give the pitch of this amount at its lower edge promised by Mr. Stewart, or become a sort of "shoot the chutes" affair, in either case forming a dangerous menace to navigation and barring it completely upstream. Mr. Lea suggests that upbound boats could find slack water or eddies to help them up the incline; but this is problematical and can not be guaranteed. My impression is that Mr. Lea did not count on making good the whole of the net loss of 1.53 feet on the sill of Lock 24, taking the view I understood him to express that only 14 feet on that sill is required and that lower down and at other locks the water level will be unaffected. I have already expressed my view clearly that impairment of a margin of safety enjoyed by navigation for so long is not proper and that this is not the compensation required. Before leaving these obstructions, I must also point out again that the interests of navigation must be measured with due reference to the future and that if the St. Lawrence is at any time to be made navigable for boats of a draft for which the new Welland Ship Canal is designed, this submerged weir—a rock fill 1,000 feet long up and down stream in addition to its slopes, and having as at present proposed only 15 or 16 feet of water over its surface at low water—will form a very serious obstacle removable only at very great expense.

Now if the commission does not agree with me and if, by any chance, an order of approval is to be made, I am instructed to urge that the conditions which Mr. Tawney reminds us might appear in such an order, as they have in other cases—must necessarily be of a most stringent charcter; and without for a moment waiving our opposition "without prejudice" so to speak—and partly because the commission suggested it was the duty of parties to express themselves in this respect, I suggest a minimum requirement conditions which will:

(1) Provide for effective supervision and accurate means of measurement, so that from the moment of commencement until completion and at all times thereafter all the interests of navigation may be efficiently and promptly protected.

(2) Provides guarantees requiring the application of immediate remedies or reinstatement of previous conditions at any time when

these may appear requisite to the commission or to the duly appointed board of supervision.

(3) Provide ready means for receiving and determining as to complaints of navigators, and certainty of prompt action upon such complaints.

(4) Provide security for damages suffered by anyone by reason of interference, temporary or permanent, with rights at present enjoyed.

Mr. POWELL. How long is your season of navigation?

Mr. KING. The height of the passenger boat season is July and August; the boats commence running in May and run into September.

Mr. POWELL. Outside of that, is there practically any navigation during the remainder of the year?

Mr. KING. Outside of the passenger boats, and as to upstream navigation we would only be concerned with the question of the tugs.

Mr. POWELL. There are only one or two of these.

Mr. KING. These may require to use the river at any time; you can never tell when they will exercise the right of navigation there or how many of them will do it.

Mr. POWELL. If the canal was not there, there would be a great deal more patronage of the river.

Mr. KING. Quite true. I think I know what you have in mind, that the obstruction must not be an "unreasonable obstruction."

Mr. POWELL. With the natural facilities for navigation there, would it not be proper for us to take into consideration the fact that Canada has an artificial means of navigation?

Mr. KING. With which these works will probably interfere.

Mr. POWELL. I do not refer now to interference; I am referring now to the canal. Do you take the whole into consideration, assuming that the canal is there?

Mr. KING. I think we must take the canal into consideration; I think it is an integral part of the whole river navigation thrown open by the old treaty of 1842 and subsequent arrangements.

Mr. POWELL. Do you think Canada is ready to say: Independent of our canal entirely, which is our own, which is not an international matter, which is not within the jurisdiction of the commission, we want navigation in that river, and we want that navigation looked at independently of our own facilities?

Mr. KING. I think you must look at the two separately. I do not think you could interfere with the navigation of the river, because you have a second string to your bow, and, if for no other reason, I think, you should not interfere with the river, because the canal might break down any day and commerce be tied up for a considerable time if you have not the river to which to resort.

ARGUMENT OF MR. VAN KENNEN (IN REPLY).

Mr. VAN KENNEN. There are one or two things I want to say. I was a little disturbed to hear Mr. King state that these compensating works did not compensate. I believe the testimony on that was very clear, and I thought while our witnesses differed a little they were perfectly in accord upon the principle and that it was conceded that by putting in the so-called compensating works they

did restore the condition of the water at the entrance; there was a little difference between Mr. Stewart and Mr. Lea regarding the initial lowering of the water. That was due to the fact, as I understand it, that Mr. Lea took his figures at 190,000 minimum or 194,000, while Mr. Stewart took his figures at 2,000 as the present passage of the Little River, while Mr. Lea took his figures at 3,000. But, with respect to other matters, I take it that these witnesses did not differ. Whether I am right or wrong on that the evidence will disclose.

I want to say clearly that so far as that is concerned if you will look at our application it provides that we are not here asking this matter to be approved when it interferes with navigation in the spirit of what you have before you. I think it must be plain to the commission that we recognize the rights of navigation and are willing in every way to protect these rights. We are ready to accept any order that will protect navigation. But simply because Mr. King says that the project will increase the current, and that Mr. Stewart says it will increase it 2 miles, and that another man says it will increase it a little more, and that in that case it is just possible that a boat can not go up the stream, and one of the boats might have to go through the locks, it does seem to me that if you have any jurisdiction at all, if you have any powers at all, that you ought to say that this applicant shall not be denied his rights because there is the possibility that has been pointed out by these gentlemen. I suppose that this commission, being a judicial body, can determine something, and that it would have the right to determine whether this would unduly interfere with navigation, and if it did they would make some arrangement whereby that interference would be obviated as far as possible.

With respect to Mr. Keefer's position, I am really astounded in a way, for the simple reason that it is tantamount to an absolute denial of our rights. He tells us that we should go to Mr. Stewart, or to somebody else, and get their permission before coming to the commission. Then Mr. Keefer says: Now, Mr. Van Kennen, you ought to delay this matter until we find out whether we can unite upon this larger and, as I believe, somewhat better scheme. I say in reply to that: I can not delay until then. Our people have got nearly half a million dollars invested here, and they are paying interest on that money; they are paying taxes; they are paying other charges, and every year and every day and every hour of delay is a loss to them. Mr. Keefer's action, as I look upon it, is a ruthless denial of our rights. I believe that this tribunal has the right to meet, to cope with, and decide just such questions as are presented to it here. We have submitted all this matter to the representatives of the Canadian Government before now. I am willing to adopt any kind of suggestion in reason. I sincerely wish that we were able to say to this commission, or to anybody else, that we came here with a charter for this greater development that has been referred to. But we can not do it; that is an utter impossibility, and of course when that suggestion is made in that way, it is, in that respect, a denial of our rights entirely. To think of the Government of the United States giving us a charter of that kind, and the State of New York giving us legislation which would give us that right is, in my judgment, as impossible

as anything that you can well conceive of. We must rest upon what rights we have now, and what rights we have had for 122 years, or else we have no rights. We can not do anything more than that. If the Government of Canada goes on with this scheme, we will join with them; we will aid them. I will promise that now, because I think it might be beneficial to us. But to predicate our right to come to this commission, or make it a condition precedent that we will get such legislation from the Federal Government authorizing us to go on with that general scheme, is such an impossibility that I say it would be a denial of our rights.

I do not think I have much further to say. I think both Governments want to be entirely fair in regard to this matter. I certainly am not here prepared to discuss the jurisdiction and the power of this commission, but if I understand Mr. Keefer's position aright, he contends that this commission has no power in the matter. Carried out to its logical conclusion that is his view. His contention is that if I can get the consent of the State of New York, and if I can get the consent of the Federal Government, and if I can get the consent of the Canadian Government, then I do not need this commission at all; the commission has no power, but has to act just simply as a clerk to record something.

Mr. TAWNEY. You would not need the commission to even act as a clerk in that case, because under Article XIII that would refer to a special agreement or reciprocal legislation on the part of both countries.

Mr. VAN KENNEN. I shall not discuss that because I am not here for that purpose, and because I do not think we ought to be confronted with that impossible condition. If that principle were paid attention to, then our application and any other applications that come before this commission, might just as well be put in the pigeonholes and never considered.

I may briefly allude to what has been said by Mr. McLean. In one way, I do not think that we disagree very materially. I think that we are agreed that we are entitled to the natural flow of that stream. I want to say, however, that I do not agree that because the year before last one of the mills on that dam burned down, and thereby put into disuse a part of that, that therefore we lose our rights. Five years ago another mill burned down, and I remember very, very distinctly that within a period of the last few years three or four of these mills, the largest on the dam, were actually in operation. And it certainly is true, and there is no statement to the contrary in the testimony, that at the time of the improvement of your canal and at the time of the original construction of the canal we certainly were using in that river approximately the full natural flow of that stream. There can not be any question about it.

Mr. POWELL. Nearly 30,000 horsepower?

Mr. VAN KENNEN. We do not claim 30,000 horsepower.

Mr. MIGNAULT. About 27,000 horsepower.

Mr. VAN KENNEN. I mean the mean actual flow.

Mr. POWELL. How many plants had you running?

Mr. VAN KENNEN. I do not think, taking it off and on, that there were less than 25, and from 25 to 30.

Mr. MIGNAULT. It is guesswork to determine how much water.

Mr. VAN KENNEN. There is no evidence on that point, except the extent of the mills that were there. There is no evidence to say here, as Mr. King wanted you to infer, that ever since this canal was built we had not been utilizing the 2,000 c. f. s. If that is the inference he wants to draw, there is no evidence in support of it.

Mr. MAGRATH. Your flow is very much restricted ever since the erection of that bridge some 75 years ago?

Mr. VAN KENNEN. Yes; at one time we had a very large opening there. I will admit before this commission that there is no positive evidence as to the amount of water that was actually used by our mills at the different dates. There is evidence as to the dates on which these mills were in operation, but then, as you quite understand, it must be more or less a guess as to how much water they were using.

Mr. POWELL. Were they sawmills?

Mr. VAN KENNEN. Flour mills, sawmills, shingle mills, paper mills; there was one of the largest rag-paper mills in the country there.

Mr. POWELL. What was its output?

Mr. VAN KENNEN. That would be too much of a guess for me to say.

Mr. POWELL. Twenty-five plants using each 1,000 horsepower on the average is a pretty big assumption.

Mr. VAN KENNEN. I think that estimate would be too large, but some of them must have been using 500 or 600 horsepower each.

Mr. POWELL. How many gangs would be in the sawmill?

Mr. VAN KENNEN. I do not know; they were very large mills. Until within the last 50 years that was one of the best-wooded countries we had, and this was one of the busiest little villages in our community up to the time when, as I said in my remarks before, the forest began to be cut off and until the flour-milling industry in the West drove out the little fellows, and we succumbed along with the rest of them.

Mr. TAWNEY. Have you ever looked up to see what was the highest rate of population recorded in that village?

Mr. VAN KENNEN. No; it would not exceed 1,200 or 1,500 at the best—maybe 2,000. But, sir, there is another element. The evidence shows that in the canal they are developing approximately 1,500 c. f. s. for the use of the canal for power purposes on the other side. Now, if the rule of estoppal is to apply, it is about time we made some protest against the use of that water; otherwise they may be saying that we consented. But Mr. Stewart gives the inference that at least out of that 1,500 c. f. s. used for power purposes on the canal, which nobody has ever made any protest against, at least 1,000 c. f. s. of that is used——

Mr. KEEFER. I do not think Mr. Stewart said anything about that.

Mr. VAN KENNEN. I think he said 1,500.

Mr. STEWART. I beg your pardon; I knew there was a power plant there, but I had no idea of the amount of water used by it. Mr. Lea tried to say that, but I did not back him up; I do not know.

Mr. POWELL. My recollection agrees with that of Mr. Stewart on that point.

Mr. KEEFER. I think Mr. Stewart said he did not know, and Mr. Van Kennen made the suggestion.

Mr. VAN KENNEN. If I have misquoted Mr. Stewart, I withdraw it.

Mr. POWELL. Somebody said it.

Mr. STEWART. I did not know.

Mr. TAWNEY. I do not know whether, Mr. Van Kennen, in your main argument you discussed the question at all—if you have you do not need to discuss it again—as to what effect you claim the act of 1826 would have upon the time limitation in the act of 1808 with respect to the time of the right to use the water which is given you under the act of 1808. Now, under the act of 1826, as I view it on a very hasty consideration, that provision has been revoked and the rights under the act of 1808 are in perpetuity.

Mr. VAN KENNEN. That was my interpretation, substantially speaking.

Mr. TAWNEY. I did not know whether you had argued it.

Mr. VAN KENNEN. I mentioned it, but I did not argue it as clearly as you have stated it. The object of the act of 1826, apparently, was to make it definite that they wanted to reserve the right to regulate the tolls, and not to make any mistake about that.

Mr. TAWNEY. And also to draw water below the canal.

Mr. VAN KENNEN. Yes. That is all there was in that, so far as I understand it.

Mr. MIGNAULT. Did you ever consider whether, that being your demand at the point marked "A" on plate 1, to develop as much power as you could in the Little River, whether you could not make a development that would not interfere with navigation on the main river? I presume that if you take 30,000 c. f. s. it must be compensated for. But, if you take less?

Mr. VAN KENNEN. That is an engineering point that I would not want to discuss.

Mr. MIGNAULT. Another point that has been running through my mind is that if for any reason your dam were carried away, the Morrisburg Canal would be put out of commission, so that there are these two questions: Whether you can not make some use of your water which would not interfere with navigation? It may not be the development, such as you contemplate, but is there no use that you could make of your property without requiring these compensating works in the main river?

Mr. VAN KENNEN. I have to answer that by stating at the present time we are taking out 2,000 c. f. s. Now, if we take out 3,000 c. f. s. it certainly is going to have some slight effect upon the elevation. Then Mr. King would be here to say immediately: You are taking out another thousand feet there, and that is interfering with navigation and you can not do it. Mr. Keefer would say the same thing. If you mean by that that if we can use the natural flow of the stream, which we claim we have the right to use, if we can utilize it, I say, absolutely yes, we can develop power there profitably. But we can not develop power there properly at 3,000 c. f. s.

Mr. MIGNAULT. And you say that Canada is interested in the maintenance of your dam, because if your dam goes out the Morrisburg Canal goes out.

Mr. VAN KENNEN. We think so; we certainly can not keep the dam there unless we can make something out of it.

Mr. MIGNAULT. In its present condition it can not last long, and it is a serious question for the two countries to consider.

Mr. VAN KENNEN. We certainly can not spend money there unless we can make some development and get some return on the capital we have invested.

Mr. MCLEAN. As to the prescriptive rights that may be acquired against the State that is covered under section 362 of the New York Code of Civil Procedure, which, in effect, provides that the State will not bring an action to divest people of title where they have been holding 40 years after the cause of action accrued.

That does not mean that the State might continue anybody as a tenant at will for an indefinite time; but if it continued them as a tenant at will, and then said: You must get out of the occupation held for 40 years, then the State could not bring an action to oust them.

Mr. VAN KENNEN. My learned friend has put on the record citations of cases to which I have not had an opportunity to refer. May I file a brief with regard to that?

Mr. MAGRATH. Certainly; any counsel in the case may do that; we will only be too pleased to have it done.

The commission then adjourned.

INDEX.

APPENDIX TO HEARINGS AND ARGUMENTS

CONTAINING

APPLICATION, RESPONSES, BRIEFS, AND DOCUMENTARY EXHIBITS.[1]

CONTENTS.

[1] Exhibits not printed, being engineers' charts and photographs, are on file in the offices of the International Joint Commission at Washington, D. C., and Ottawa, Canada.

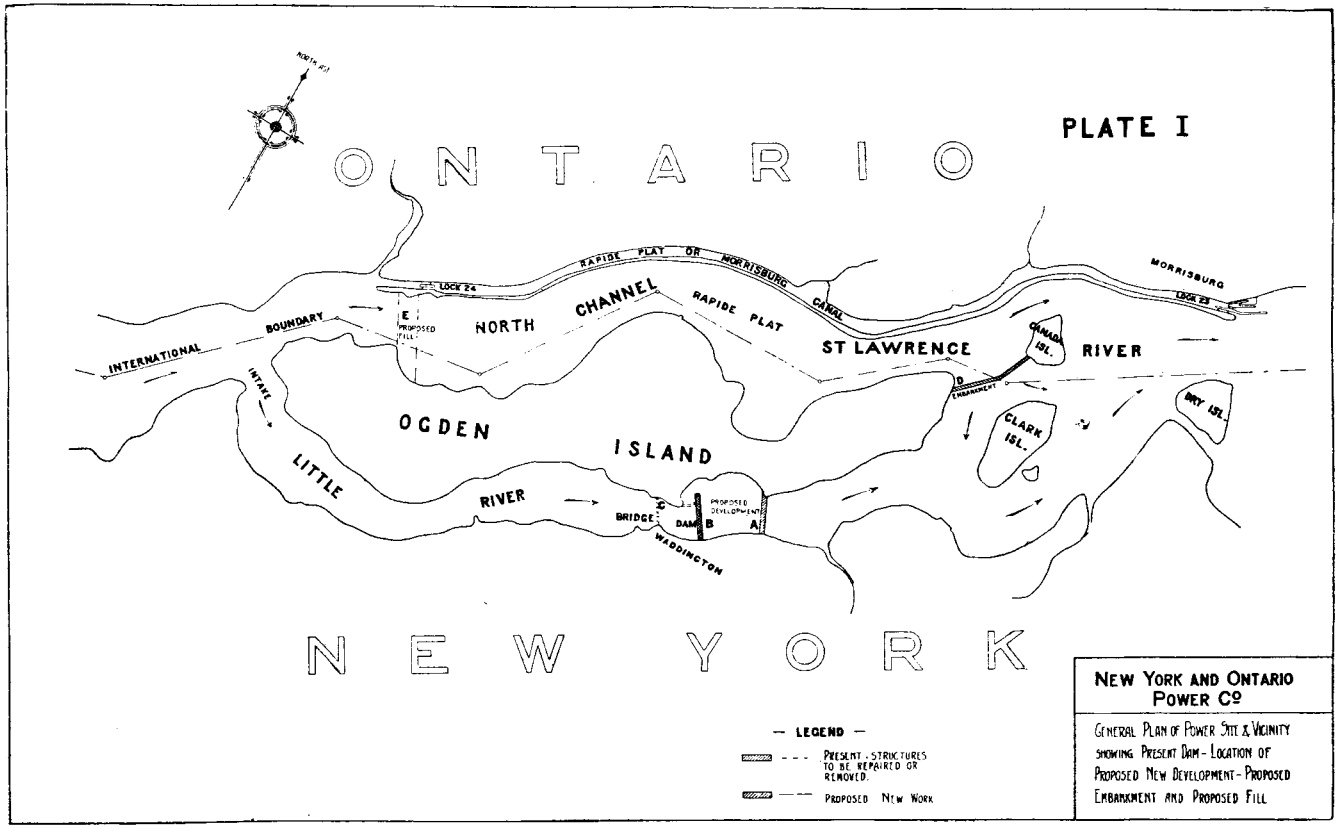


PLATE I
ONTARIO
NEW YORK
NORTH
INTERNATIONAL
BOUNDARY
LOCK 24
RAPIDE PLAT OR MORRISBURG CANAL
RAPIDE PLAT
CHANNEL
NORTH
ST LAWRENCE
RIVER
MORRISBURG
LOCK 23
CANADA ISL.
E
PROPOSED FILL
D
EMBANKMENT
INTAKE
OGDEN
ISLAND
CLARK ISL.
DRY ISL.
LITTLE
RIVER
BRIDGE
C
DAM
B
A
PROPOSED DEVELOPMENT
WADDINGTON
— LEGEND —
PRESENT STRUCTURES TO BE REPAIRED OR REMOVED.
PROPOSED NEW WORK
NEW YORK AND ONTARIO POWER Co
GENERAL PLAN OF POWER SITE & VICINITY SHOWING PRESENT DAM - LOCATION OF PROPOSED NEW DEVELOPMENT - PROPOSED EMBANKMENT AND PROPOSED FILL

APPLICATION OF NEW YORK & ONTARIO POWER COMPANY FOR APPROVAL OF ITS PLANS TO RECONSTRUCT, REPAIR, AND IMPROVE ITS DAM, HYDRAULIC STRUCTURES, AND WATER POWER PROPERTY AT WADDINGTON-ON-THE-ST. LAWRENCE, NEW YORK.

To the honorable the International Joint Commission, Washington, D. C., and Ottawa, Canada.

The petition of the New York & Ontario Power Company respectfully shows:

(1) That the New York & Ontario Power Company is a public service corporation, duly organized under and pursuant to the transportation corporation law of the State of New York, with an authorized capital stock of two million dollars ($2,000,000).

(2) That said corporation was organized for the purpose inter alia, of acquiring water powers, water rights, privileges, and other property for the production, utilization, and transmission of electricity for light, heat, and power to be used in Northern New York and Canada.

(3) That on application duly made, the Gas and Electricity Commission and the Public Service Commission of the State of New York authorized said corporation to transact business in the State of New York and elsewhere, and to acquire certain water power properties, rights, and privileges, together with other property connected therewith and appurtenant thereto, situate at Waddington-on-the-St. Lawrence, New York.

(4) That pursuant to such authority and consent, the said New York & Ontario Power Company did acquire by purchase such water power property, rights, privileges, and other property and has duly entered into possession of the same and, since the purchase, has been engaged in the business of producing, utilizing, and transmitting electricity for light, heat, and power at said place.

(5) That the property so acquired consisted of a water power created by the construction of a dam and hydraulic structures in and across what is locally known as the "Little River" from Ogden's Island, formerly known as "Isle-au-Rapid-Plat," in the River St. Lawrence, to the American shore, together with all water rights and privileges connected therewith and appurtenant thereto, and including a light and power plant then in operation.

(6) The said "Isle-au-Rapid-Plat" is an American island lying in the River St. Lawrence, south of the International boundary line, and the said "Little River" flows between said island and the American shore. See plate 1 hereto attached and made a part hereof.

(7) That said dam and hydraulic works were originally constructed prior to the year 1808 by David A. Ogden and associates who were then the owners of said "Isle-Au-Rapid-Plat," together

with all the lands on the American shore lying adjacent thereto, and likewise owned any and all riparian rights and privileges incident thereto and connected therewith.

(8) That on the 1st day of April, 1808, the Legislature of the State of New York passed an act (Ch. 121, L. 1808, N. Y.) which with a supplemental act passed April 17, 1826 (Ch. 280, L. 1826, N. Y.), granted to and vested in the said David A. Ogden and associates their heirs and assigns:

(*a*) All lands susceptible of improvement down stream from the dam to the navigable water below.

(*b*) The right to canalize said "Little River" and improve the same for such purpose;

(*c*) The right to utilize the natural flow of the stream for the development of power and to sell and dispose of the same for industrial, manufacturing and other lawful purposes.

(9) That pursuant to the rights and powers conferred by said statutes, the said Ogden and his associates duly constructed locks and other works in connection with the dam at said place, and thereafter the said south channel was used almost entirely for the navigation of said river at that point, and the same was continuously used for navigation until about the year 1847, when a canal was constructed on the Canadian side of the north channel by the Canadian government.

(10) That ever since the construction of said dam and the enactment of the statutes above cited, the said David A. Ogden, et al., their heirs, successors, and assigns have owned, enjoyed and possessed the right and privilege to use the full natural flow of said "Little River" together with all other rights and privileges connected therewith for the development of power for the operation of factories, mills, and other industrial plants at said place, and ever since have used the same, in whole or in part, for such purpose.

(11) That the natural flow of said stream (Little River) and the power resulting therefrom to which the said Ogden, his associates and their successors in interest are entitled, is of course dependent upon the volume and stage of the water in the main river, and is shown on Plate II hereto attached and made a part hereof.

(12) That as above stated, your petitioner, the New York & Ontario Power Company is now the owner and in possession of all of the lands, water power, water rights, privileges and other property connected therewith and appurtenant thereto.

(13) That from long continued use the said dam and hydraulic works have become out of repair and in order that the power on the said "Little River" may be developed to the highest degree of commercial efficiency for the generation of electric energy, it is necessary to reconstruct, repair, and improve the same which your petitioner proposes to do if permission be granted.

(14) That, if permission be granted, your petitioner further proposes to dispose of the rock and other suitable material excavated in connection with the erection of its power house, and in the removal of obstructions in the channel of said "Little River" for the construction of an embankment from the eastern extremity of Ogden Island to Canada Island at a point on Plate I, marked "(D)," and to contract the channel of the main river at a point marked "E" on Plate I by filling in the deeper part of the channel and by construct-

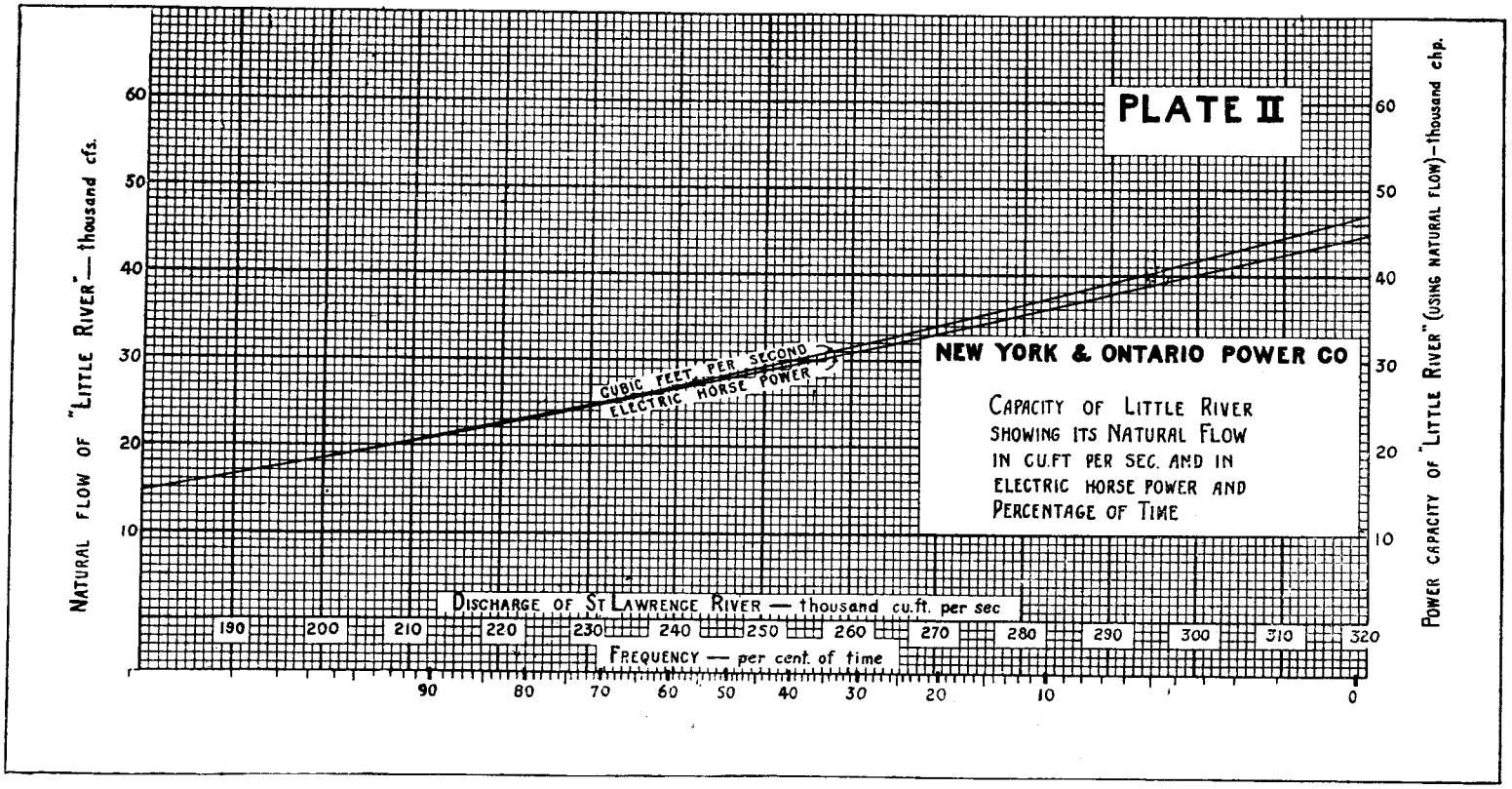


PLATE II
NEW YORK & ONTARIO POWER CO
CAPACITY OF LITTLE RIVER
SHOWING ITS NATURAL FLOW
IN CU.FT PER SEC. AND IN
ELECTRIC HORSE POWER AND
PERCENTAGE OF TIME
NATURAL FLOW OF "LITTLE RIVER" — thousand cfs.
POWER CAPACITY OF "LITTLE RIVER" (USING NATURAL FLOW) — thousand chp.
CUBIC FEET PER SECOND
ELECTRIC HORSE POWER
DISCHARGE OF ST LAWRENCE RIVER — thousand cu.ft. per sec
FREQUENCY — per cent. of time
10
20
30
40
50
60
190
200
210
220
230
240
250
260
270
280
290
300
310
320
90
80
70
60
50
40
30
20
10
0

ing a side embankment along the north shore of Ogden's Island, the result of which will

(a) Lower the level of the water in the tail race, thereby increasing the head upon the power plant.

(*b*) Eliminate a strong side draft current now flowing between Ogden and Canada Island, thereby improving navigation at that point.

(*c*) Raise the level of the water in the north channel up to and beyond Lock 24, thereby further improving navigation, and in low water periods, more than fully compensating for any increased flow through the Little River channel.

(15) That in consideration of the improvement to navigation effected by the construction of said embankment between Ogden Island and Canada Island, and by the proposed contraction of the channel of the river as aforesaid, your petitioner requests that it be permitted to supplement the natural flow of the "Little River" by the diversion of such additional waters as may be required to maintain the discharge therein at a flow of thirty thousand (30,000) cubic feet per second at all times when such additional diversion does not detrimentally affect navigation.

Wherefore, your petitioner prays, if jurisdiction be taken, that its plans be approved to—

(*a*) Remove the present dam and construct a new dam and power house at a point marked "A" on plate No. 1, hereto attached; or, in the alternative, repair and reconstruct the present dam and erect a power house at a point marked "(B)" on said plate No. 1.

(*b*) Improve the channel of "Little River" above the dam by the removal of all artificial obstructions, such as bridge piers and the like, shown at a point marked "C" in plate No. 1, and make such excavation in said channel as will enable petitioner to use the natural flow of said stream at the highest degree of commercial efficiency.

(*c*) Use the rocks and other suitable material excavated in the erection of its power house and in the removal of artificial obstructions in the channel of the "Little River" to construct embankments between the easterly extremity of Ogden Island and Canada Island, and to contract the channel of the river opposite Lock 24 by filling in the deeper portions and by constructing embankments at points marked "D" and "E" on plate I.

(*d*) Permit the diversion of such additional waters as may be required to maintain a discharge of thirty thousand (30,000) cubic feet per second at all times when such additional diversion does not detrimentally affect navigation.

All of which is respectfully submitted without prejudice to the rights and interests of your petitioner.

Dated, February 2, 1918.

THOMAS SPRATT and GEO. E. VAN KENNEN,
Attorneys for Petitioner,
Office and post-office address, 82 Ford Street, Ogdensburg, N. Y.

DISTRICT OF COLUMBIA, *City of Washington, ss:*

W. S. Connolly, being duly sworn, deposes and says, that he is an officer of the New York & Ontario Power Company, the petitioner above named, to wit, the president thereof; that he has read the fore-

going petition and knows the contents thereof; that the same is true to his own knowledge, except as to the matters therein stated to be alleged upon information and belief, and as to those matters he believes it to be true.

W. S. CONNOLLY.

Sworn to before me this 21st day of March, 1918.

GERTRUDE ELLIS, *Notary Public.*

INTERNATIONAL JOINT COMMISSION.

STATEMENT IN RESPONSE ON BEHALF OF THE DOMINION OF CANADA.

In the matter of the application of the New York and Ontario Power Company for approval of its plans to reconstruct, repair, and improve its dam, hydraulic structures, and water power property at Waddington-on-the-St. Lawrence, New York, and to permit the diversion of such additional water as may be required to maintain a discharge of 30,000 c. f. s. at all times when such additional diversion does not detrimentally affect navigation.

To the honourable the International Joint Commission, Washington, D. C., and Ottawa, Canada:

The undersigned, as council for the Dominion of Canada, respectfully submits:

(1) The application herein asks for the approval of your commission of the following:

(*a*) The construction of a dam and power house near the northeastern end of Ogden Island (or Isle-au-Rapide Plat) completely closing Little River.

(*b*) Upon the construction of this dam, to remove the present old dam.

(*c*) Or in lieu of this to repair the old dam and construct a new power house in it.

(*d*) To improve the channel of Little River both above and below the works by the removal of all artificial obstruction, such as bridges, piers, silt, etc., and to make such further excavation as may be necessary to enable the petitioner to use the natural flow of said stream at the highest degree of commercial efficiency.

(*e*) Permission to construct a submerged weir in the main river opposite Lock 24 of the Morrisburg Canal, for the purpose of contracting the channel and raising the river level above.

(*f*) Permission to construct an embankment to connect the easterly extremity of Ogden Island and Canada Island, for the purpose of diverting the whole flow of the main stream through the channel between Canada Island and the Canadian main shore, thus raising the level at this place, and by backwater, restoring to the rapids the depths lost by the diversion through Little River above. This embankment will also protect the tail race of the petitioner's proposed new power plant and improve the head at said plant.

(*g*) Permit the diversion through Little River and the applicant's power canal of such additional water as may be required to maintain a discharge of 30,000 c. f. s. at all times, when such additional diversion does not detrimentally affect navigation.

(2) The application has been referred to your commission by the United States of America, and in the letter of transmittal from the Second Assistant Secretary of the Department of State is the following:

> The application is therefore within Article III of the waterways treaty and the situation is governed by Article VIII, which stipulates that your commission shall have jurisdiction and shall pass upon such an application in accordance with certain rules and principles as therein stated.
>
> I desire to state, however, in this relation that the Government of the United States is not prepared at this time to give formal approval to the company's plans, since the project involves the development of water power with regard to which there is at present under consideration by Congress important legislation which, if enacted, may materially change existing Federal laws. However, it would seem not inappropriate that the company's application should be considered by the International Joint Commission in advance of approval or disapproval on the part of either Government.

(3) By the said Article VIII of the treaty it is also provided that your commission, "in its discretion may make its approval in any case conditional upon the construction of remedial or protective works, to compensate so far as possible for the particular use or diversion proposed, and in such cases may require that suitable and adequate provision, approved by the commission, be made for the protection and indemnity against injury of any interests on either side of the boundary.

(4) A copy of this application was sent to the Government of the Dominion of Canada shortly after the case was filed with your commission, at Washington, on the 24th April, 1918.

The rules of procedure of your commission call for the filing in response to such an application, a statement "setting forth any fact or facts bearing on the subject matter of the application and tending to defeat or modify the order of approval sought, or to require that the same be granted on condition, and setting forth whether the order of approval is opposed in whole or in part, and, if in part only, to what 'extent,' and if it be desired that the approval be on condition, setting forth the particular condition or conditions upon which it is thought the order of approval should be granted" and that such statement be filed within thirty days. But the said rules also provide that the time for the filing of any paper or the doing of any act required thereunder may be extended and an extension of sixty days has been asked for and has been granted to the Dominion of Canada.

(5) It is premised: (*a*) That the St. Lawrence River is still an international stream for thirty miles below Waddington and that the navigation of the whole river to the Atlantic is, for the purposes of commerce, free and open to the citizens of both countries.

(*b*) That Little River is the smaller of two channels into which the St. Lawrence River is divided by Ogden Island (Ile au Rapide Plat).

(*c*) That the navigation of St. Lawrence River is obstructed for up-bound boats at Ogden Island by Rapide Plat, where the fall is approximately 12 feet, but down-bound boats are able to "run" the rapids.

(*d*) That the navigation of St. Lawrence River is a subject that has engaged the attention of the Government of Canada for many years and Canada has built the St. Lawrence River canals to over-

come the difficulties of navigation at this and other similar places in the river.

(*e*) That Canada has already constructed two canals opposite this point, at a cost of $2,158,242, and has expended for the whole system between Lake Ontario and Montreal $54,025,623.

(*f*) That, by treaty, the use of the St. Lawrence and other canals in Canada is secured to the citizens of the United States on the same terms as to the citizens of Canada.

(*g*) That to keep pace with the ever-increasing demands of navigation Canada is now embarking on a fourth enlargement of her canal system, that will greatly facilitate passage of freight between the Great Lakes and tide water by deepening the river and reducing the number of locks.

(*h*) That Little River was closed by the dam referred to by the applicants about 1806 and the flow has been almost entirely diverted to the main channel. As a consequence, the level of the river at the head of Ogden Island has been raised and maintained about 1 foot and giving, by backwater, lesser amounts in the stretch of river between the foot of Galops Rapids and the foot of Rapide Plat.

(*i*) That the present Morrisburg and Iroquois Canals were designed and constructed to conform to this artificial level which had been in existence, at that time, over 75 years.

(*j*) That any decrease of this level will injuriously affect navigation (1) over the lower sill of the Iroquois Canal; (2) through the full length of the Morrisburg Canal (except on the lower sill); (3) through the Rapide Plat.

(*k*) That the original grantees having already constructed a dam across Little River, by virtue of riparian ownership of both banks of said river, appear to have afterwards obtained the right to construct a canal "for the purpose of making a complete navigable water communication" at this place and then was given the right (which appears to have been limited to 75 years from the 1st April, 1808) to use the water contained in said improvement for water power purposes.

(*l*) That the applicants, the successors of the original grantees, desire to use Little River in an entirely different manner; that is to say, interrupt the navigation of said Little River, increase the flow therein for power purposes only, and in so doing draw the water from the main channel upon which navigation must depend.

(*m*) That the future contemplated enlargement of the Canadian canal system will in all probability necessitate the construction of a dam in the vicinity of Canada Island completely blocking the river, raising the water to the level of Lake Ontario, and providing means for control of the level and outflow of the said lake.

(*n*) That for perfect regulation of the level of Lake Ontario it is necessary that the Governments of the two countries should have absolute control of the whole channel of the river.

(*o*) That with such a scheme the water at the head of the intake to applicant's canal will be raised about 15 feet, completely submerging the proposed works.

The Government of Canada, therefore, submits that the prayer of the applicants be not granted for the following amongst other reasons:

1. It will interfere with the full and economic development of the St. Lawrence system as regards the navigation thereof and the power potentialities therein which are common to both bordering countries and of equal advantage to each country.

2. It will interfere with the complete regulation, by a dam at Canada Island, of the level and outflow of Lake Ontario.

3. The said future development of the river will necessitate the acquisition of any rights the applicant may have in the river, and the Government of Canada considers it to be inadvisable to create more.

4. That original grantees' rights from which applicants claim title have lapsed by efluction of the time mentioned in the original grant or amendments thereto.

5. That the applicants, as successors to the original grantees, are now asking something entirely different from the privileges granted by the original acts of the Legislature of New York.

6. The St. Lawrence River has enormous potentialities that should be developed in the most efficient and economical manner for future generations. Such a piecemeal policy as proposed is not in conformity with this doctrine.

Respectfully submitted.

FRANK H. KEEFER,
Of Counsel for the Government of the Dominion of Canada.

CANADA FOOD BOARD, OTTAWA,
July 15, 1918.

INTERNATIONAL JOINT COMMISSION.

STATEMENT IN RESPONSE ON BEHALF OF THE STATE OF NEW YORK.

In the matter of the application of the New York and Ontario Power Company for approval of its plans to reconstruct, repair, and improve the dam, hydraulic structures, and water-power property at Waddington-on-the-St. Lawrence, New York.

To the honorable the International Joint Commission, Washington, D. C., and Ottawa, Canada:

In reply to the application of the New York and Ontario Power Company for approval of its plans to reconstruct and repair its dam and other properties situate at Waddington-on-the-St. Lawrence, in the State of New York, the undersigned as counsel for the State of New York, respectfully submits:

(1) That the control of navigable waters within the State of New York, whether interior or boundary waters, is one of the sovereign powers of the State subject only to the paramount right of Congress to control same with respect to navigation.

(2) That the State of New York is the owner of the fee of the land constituting the beds of boundary streams lying within the boundary lines of the State, except in cases where the same has been specifically granted.

(3) That the "Little River" referred to in the petition of the applicant herein, from its commencement at the westerly end of Ogden

Island to its termination at the easterly end of said island, lies wholly within the State of New York, but constitutes a part of the boundary waters between the State of New York and the Dominion of Canada; that the said Little River is a navigable stream which in the past has been developed in the interests of navigation and is capable of further development for the promotion and encouragement of such interests.

(4) That the rights and privileges granted to Joshua Waddington, David A. and Thomes L. Ogden, pursuant to chapter 121, laws of 1808, have expired by express limitation in the said act contained and that any rights and privileges alleged to have been acquired by the applicant under and pursuant to said statute have ceased and determined.

(5) That unless the consent of the State of New York shall first be obtained, the right of the applicant, if any it shall have, to the use of the waters of said Little River is limited to the use of the natural flow of said river.

(6) That the erection of a dam across the Little River between the American shore and Ogden Island at a point marked "A" on a map attached to the application and filed therewith, and the construction of an embankment between the eastern extremity of Ogden Island and Canada Island, and the filling in of deeper portions of the channel opposite Lock No. 24, would constitute an unlawful interference with the navigation of the St. Lawrence River.

(7) That the State of New York is unable to agree to the proposed construction work set forth in the petition of the applicant, for the following reasons:

(*a*) That such construction work will constitute an unlawful interference on the part of the applicant with the navigation of the St. Lawrence River.

(*b*) That it will permit the applicant to divert and use a greater flow of water through the Little River than the normal or natural flow of the said Little River without first having obtained the permission of the State of New York so to do.

Respectfully submitted.

MARSHALL MCLEAN,
Special Deputy Attorney General,
of Counsel for State of New York.

INTERNATIONAL JOINT COMMISSION.

STATEMENT FILED ON BEHALF OF THE DOMINION MARINE ASSOCIATION WITH RESPECT TO THE APPLICATION OF THE NEW YORK & ONTARIO POWER COMPANY TO THE INTERNATIONAL JOINT COMMISSION.

To the honourable the Chairman and Members of the International Joint Commission, Washington, D. C., and Ottawa, Canada.

The Dominion Marine Association, representing the owners of Canadian vessels interested in the navigation of the Great Lakes and Upper St. Lawrence River, presents the following statement with reference to the pending application of the New York & Ontario Power Company.

1. Navigating in this section of the river is extremely difficult under present conditions, whether the canal or the main channel of the river is used.

(*a*) In taking the canal downbound and navigating with the proper speed to make Lock 24 vessels are seriously affected by the heavy current which passes the head of the canal, and masters are accustomed to turn their ships around and head upstream. Some purposely beach the vessel on the north bank, thus holding her head while the current swings the stern around; and they then drop back stern first into the canal and turn again in the entrance. In the case of the larger steamers the difficulty is of course accentuated; and it is quite impossible to run tows down the canal safely. This is recognized by the canal authorities and urgent recommendations for improvement have been made by the Dominion Marine Association to the Department of Railways & Canals from time to time. It is understood that various improvement plans are being considered by the Department.

(*b*) In taking the main channel downbound to avoid the difficulties and loss of time attendant on the passage of the canal, vessels pass through the difficult Rapide Plat shown on plate 1 of the application, and they do so, drawing the ordinary canal draft of 14 feet of water, only when conditions are favourable. Navigability at this draft is dependent upon the stage and flow of the river and is also seriously affected by certain winds. In a recent year of low water river barges were sent down these rapids drawing only 12 feet. There is, of course, additional danger in any slight loss of depth in the rapid water of a tortuous and boulder strewn channel where there is ordinarily scarcely enough water for a canal draft vessel; and the loss of carrying capacity, due to a restriction in draft of even an inch, is serious.

(*c*) In taking the main channel upbound a steamer of ordinary power requires the assistance of a tug. The main channel is frequently used by upbound boats, and has proved of great value when the canal has been for any reason out of commission.

2. It is self-evident that the rock fill shown at E in plate 1 of the application, and the enlargement of the Little River channel to permit increased withdrawal of water in that direction, must necessarily decrease the water in the Rapide Plat; and it can not be said with certainty that the other rock fill below the Rapide Plat, shown at D, designed as it is, primarily, to improve the applicant's tail-race in the Little River, will compensate the loss of water in the rapid. The application on page 4 enumerates the contemplated changes affecting navigation and apparently ignores the need of water in the Rapide Plat. It does not suggest maintenance or improvement of levels in that section.

The compensating side embankment on the north side of Ogden's Island (page 4 of the application) should also develop an objectionable current.

3. Navigation is also difficult in the neighborhood of Canada Island, and while the proposed rock fill at D will eliminate a certain cross current, it will necessarily greatly increase the flow and at the same time change the direction of the current in the curved channel above and north of Canada Island, and the extent of the danger from these changes is unknown and consequently feared.

4. The greatly increased flow in the restricted channel north of Canada Island will probably debar upbound vessels from using the river channel instead of the canal.

5. The Dominion Marine Association therefore submits that, apart altogether from the general considerations hereinafter set out, the reasons already mentioned and a due regard to the provisions of Article VIII of the treaty with reference to the relative importance of navigation and power require—

(*a*) That the present application should not be considered at all unless in the first place in complete accord with the plans of the Dominion department of railways and canals; and that its allowance, in whole or in part, should be refused if such allowance would in any way interfere with or prejudice in the slightest the required improvements at the upper entrance of the canal;

(*b*) That the improvement in conditions at the head of this canal, if any such improvement would result from the works proposed, should not be sought at the expense of the navigability of the Rapide Plat, if it is otherwise attainable;

(*c*) That the full flow of the main channel should not be forced north of Canada Island with the objectionable results indicated in paragraphs 3 and 4 above.

6. But dealing with the application in more general terms the Dominion Marine Association submits that while the development of the St. Lawrence by the Governments of the two countries under some general scheme designed to improve navigation and utilize power might meet with general approval, nevertheless merely local developments by private parties primarily interested in their output of electrical power and only incidentally seeking to protect navigation by remedial works (which may or may not prove effective) can not sufficiently recognize the paramount requirements of navigation, can not be subjected to control which will at all seasons and under all conditions protect navigation, and in any event may prove quite inconsistent with and prejudicial to any future general development plans.

7. The Dominion Marine Association therefore maintains its attitude frequently defined in communications to the premier of Canada and to the minister of public works in opposition to all such proposals for local and private development until comprehensive plans are determined upon for the whole upper river; and the association respectfully submits—

First. That the order of approval asked for should not be made.

Second. That in any event it is essential for the due protection of the paramount interests of navigation—

(*a*) That contemplated or equivalent improvements in the Morrisburg Canal entrance be assisted or at least not prejudiced in any way whatever.

(*b*) That the available depth of water in the dangerous parts of the main channel be at least maintained, if not improved, at all seasons.

(*c*) That the safety of navigation be not in any way impaired by the formation of new channels or the development of new or increased currents or otherwise.

(*d*) That the use of the main channel of the river by upbound vessels must not be overlooked, and that nothing should be permitted

to render navigation, either up or down the river, more difficult or more unsafe.

(*e*) That the river and canal levels and flow remain as now absolutely under Government control and subject in no way whatever to impairment at the instance of private individuals or corporations.

Dated at Kingston, Ontario, July 4, 1918.

FRANCIS KING,
Counsel for the Dominion Marine Association.

INTERNATIONAL JOINT COMMISSION.

ANSWER OF JOHN C. CRAPSER TO THE APPLICATION OF THE NEW YORK & ONTARIO POWER COMPANY FOR APPROVAL OF ITS PLANS TO RECONSTRUCT, REPAIR, AND IMPROVE ITS DAMS, HYDRAULIC STRUCTURES, AND WATER POWER AT WADDINGTON-ON-THE-ST. LAWRENCE, NEW YORK.

To the honorable the International Joint Commission, Washington, D. C., and Ottawa, Canada.

John C. Crapser, of Massena, St. Lawrence County, New York, for an answer to the application and petition of the New York & Ontario Power Company for approval of its plans to reconstruct, repair, and improve its dams, hydraulic structures, and water power property at Waddington-on-the-St. Lawrence, New York, respectfully answers, says, and shows to the commission as follows:

First. That he resides at Massena, St. Lawrence County, State of New York.

Second. Denies that the New York & Ontario Power Company acquired all the water rights, privileges connected with or appertaining to a water power created by the construction of a dam and hydraulic structures in and across what is locally known as Little River from Ogden Island in the St. Lawrence to the American shore as alleged and set forth in subdivision (5) of the petition herein.

Third. Denies that the New York & Ontario Power Company is now the owner and in possession of all the lands, water power, water rights, privileges, and other property connected therewith and appertaining thereto as alleged in subdivision (12) of the petitioner's petition herein.

Fourth. Said John C. Crapser further answering the said petition, answers and alleges that heretofore and on the 30th day of June, in the year nineteen hundred and eleven, he acquired by deed from Emilie Ogden and others, certain lands and rights connected with the dam and water power situate in what is locally known as Little River at Waddington, New York, and which the petitioners herein by their petition allege to own, and which lands and water rights are described as follows:

All that tract or parcel of land, situate, lying, and being in the town of Waddington, county of St. Lawrence, and State of New York, the greater part of which lies in the bed of the south channel of the River St. Lawrence below the dam and described as follows:

Beginning at the point where the westerly line of the bridge from the main shore to Isle au Rapid Plat below the dam (as the said bridge was situated in the year 1835) is intersected by the northerly line of the grist mill lot conveyed by Joshua Waddington and Thomas L. Ogden to Cyrus B. Martin

and running thence northerly along the easterly line of said bridge to the southerly line of the grist or flouring mill lot of said Waddington and Ogden at the northerly end of the dam across the same (said southerly line being parallel to and fourteen feet six inches southerly from the southerly wall of said mill as it is now standing), thence easterly along said southerly line to the navigable waters of the St. Lawrence River; thence southerly to the northerly line of lands and land under water which were conveyed by Joshua Waddington and Thomas Ludlow Ogden to William Ogden and Samuel C. Ogden on the 20th March, 1831; thence westerly along said line to the place of beginning, including the site of said bridge below the dam and all the land and land covered by water below the same lying between said bridge, the Cyrus B. Martin grist mill lot, the Waddington and Ogden grist mill lot, and the navigable water of the St. Lawrence River.

Also the land included within the limits of "A" road or passageway not exceeding five rods in width to lead from North Street to the projected canal to be constructed along the southerly wall of said grist mill, and also another road or passageway not exceeding 50 feet in width to lead from the last-mentioned road or passageway to the bridge below the said mill as the said two roads or passageways shall be laid out and estblished for the general convenience of the said Joshua Waddington and Thomas Ludlow Ogden as reserved in the deed from Joshua Waddington and Thomas L. Ogden to William Ogden and Samuel G. Ogden.

Also all rights belonging to the heirs or successors of Rebecca Cornell Ogden in her lifetime of Waddington aforesaid to all lands in the bottom of the River St. Lawrence in the said town of Waddington from the head of the Isle au Rapid Plat (commonly known as Ogden's Island) to the foot of the same island and all rights of every kind, nature, and description now belonging to the heirs of the said Rebecca Cornell Ogden which pertain to or are connected with or which can be used in connection with the damming of the Little River between the said Isle au Rapid Plat (commonly known as Ogden's Island) and the said village of Waddington.

Being the same premises described in a deed dated the 30th day of June, 1911, from Emilie Ogden et al. to John C. Crapser, which deed was recorded in the office of the county clerk of St. Lawrence County, New York, on the 29th day of July, 1911, in liber 178 C of Deeds, at page 1519.

Fifth. Said John C. Crapser, further answering the petition herein alleges and shows to the commission that on the 21st day of June, in the year nineteen hundred and eleven, he acquired from Morris Meredith Ogden by deed, certain properties and water rights situate in the village of Waddington, St. Lawrecne County, New York, in which petitioners allege that they are the owners of, which deed was recorded in the county clerk's office of the county of St. Lawrence, New York, on the 29th day of July, 1911, in liber 179 B, Deeds, at page 685, and which properties are described as follows:

All those tracts, pieces, or parcels of land, situated in the village and town of Waddington, county of St. Lawrence, and State of New York and described as follows:

Beginning on the northerly side of West North Street at the intersection of the northerly line of said street with the easterly line of Maple Street and running thence northerly along the easterly side of said Maple Street to the margin of the River St. Lawrence; thence down and along the shore of the said river to a point where the line of the old dam intersected the same in the year 1831; thence northerly along said dam to the southerly wall of the grist mill formerly belonging to Cyrus B. Martin, thence easterly along the same and a continuation of said southerly wall to the lower or easterly line of the bridge between the vilage of Waddington and the Isle au Rapid Plat as it stood in the year 1831; thence northerly along the easterly line of said bridge to a point in the river St. Lawrence, which is a continuation of the northerly line of the grist mill lot as the same was conveyed by Joshua Waddington and Thomas Ludlow Ogden to Cyrus B. Martin; thence easterly in continuation of said last-mentioned line to a point opposite the mouth of Sucker Creek; thence southwardly to the mouth of and up the center of said creek to a point therein which is in line corresponding with and forming a continuation of the northerly line of East North Street; thence westwardly along the

northerly line of East North Street to the point where the same meets the northerly line of West North Street; thence still westwardly along the northerly line of West North Street to the place of beginning.

Also all of the island or bank on which the old distillery was erected prior to 1835, and on which the same was standing at the last mentioned date, and all the land in the bed or along the shore of the River St. Lawrence which was occupied or covered in the year 1835 by any work shop, forge, or manufactory or other building therewith connected, used, or enjoyed. Together with the rights and privileges of drawing off the waters of the pond or river above the dam through any flume or canal not exceeding 25 feet in width constructed or to be constructed in said dam between the said grist mill and the main shore or bank, and of using the same for the purposes of a canal and for hydraulic purposes, saving, excepting, and expressly reserving out and from the above severally described premises the lot of land conveyed by David A. Ogden to George Redington, and on which his stone storehouse stood in the year 1831; the lot or parcel of land conveyed by David A. Ogden to Jason Fenton, and on which his tannery was situated in the year 1831.

Also saving, excepting, and reserving out of the above severally described premises and privileges any and all lots or pieces of land or land covered by water or water rights or privileges which have been granted, conveyed, or released by Isaac Ogden, Sarah Meredith Ogden, Morris M. Ogden, or Sarah Frances Clemson since the 5th day of August, 1835.

Also excepting the lot known as the Furnace lot, being the lot 180 feet wide on East North Street, lying northerly and adjoining the west line of Oak Street, as said Oak Street was originally laid out and extending to the St. Lawrence River.

The land more particularly intended to be conveyed is the land included within the limits of Grass Street north of the northerly line of North Street; all the land included within the limits of Pond or River Street; all the land lying between River Street and the St. Lawrence River excepting the lot conveyed to S. J. Dewey; all the land included within the limits of River Street easterly of Grass Street; all the land included within the limits of Canal Street and the extension thereof to Sucker Creek, as laid down on the map made by Robert Tate in 1853. All the land included within the limits of the canal and extension thereof to Sucker Creek as shown on said map; all the land included within the limits of Oak Street northerly of East North Street; all the land included within the limits of Clinton Street north of West North Street; lots Nos. 17, 18, 19, and 20 north of the canal as laid down on the map above mentioned; all of the lands lying between the extension of the canal as shown upon said map from Oak Street to Sucker Creek and the bed of the River St. Lawrence, southerly of the north line of lands described in the first above description; the island or bank or parcel of land covered by water which was formerly known as the "Distillery Island"; a small parcel of land lying between Canal Street and lot conveyed to William Harper by Isaac Ogden, and a small gore of land lying between Canal Street and the northerly line of lots known as Bethune lot and the Deans lot; it is, however, intended that the above description should include any and all lands, rights, and privileges owned by the said Morris M. Ogden and Sarah F. Clemson or either of them within the boundaries to the lots firstly above described, whether the same are enumerated or not.

All the land upon which the stone dam erected between the village of Waddington and the Isle au Rapid Plat stood in the year 1853; all the land covered by water situated in the bed of the St. Lawrence River above said stone dam and between the main shore of said river and the southerly shore of Isle au Rapid Plat; all that part of land in the bed of the St. Lawrence River below the said stone dam lying northerly of a line drawn eastwardly from the said dam parallel to the south wall of the Waddington and Ogden Grist or Flouring Mill, more recently known as a part of the James Paper Mill, being the stone ruin now standing near the north end of the dam and fourteen feet six inches southerly therefrom and continued to the navigable waters of the St. Lawrence River, which has not been heretofore conveyed by Isaac Ogden, Sarah Meredith Ogden, Morris M. Ogden, or Sarah F. Clemson or either of them as shown by the records of the St. Lawrence County Clerk's Office on the day of this deed.

Also all that other certain piece or parcel of land situated in the village of Waddington, county of St. Lawrence, and State of New York, and bounded and described as follows: Northerly by the River St. Lawrence, easterly by Sucker Creek, southerly by the southerly line of the projected canal and the north line of the lots south of the canal, and westerly by Oak Street.

Also all that other piece or parcel of land situated in the village of Waddington, county of St. Lawrence, and State of New York, and briefly described as follows: All the land included within the limits of Maple Street between West North Street and the margin of the south shore of the St. Lawrence River.

Sixth. John C. Crapser further answering the petition herein, answers and alleges that he is one of the owners of that part of Ogden Island opposite point "E" as shown in Plate One of petitioner's petition, and that said petitioners, the New York & Ontario Power Company, have not secured any rights and do not own any property on Ogden Island, and that the proposed works set forth in the petitioner's petition would be of great damage to John C. Crapser and any other persons interested in said property if the prayer of the New York & Ontario Power Company's petition herein should be granted; the navigation of the said St. Lawrence River would be impeded by the construction of embankments between the eastern extremity of Ogden Island and Canada Island and the contraction of the channel of the river opposite Lock 24; that all navigation on said river passes down the portion of the river opposite Lock 24, which it is proposed to contract by making a fill.

Seventh. That the New York & Ontario Power Company do not own the lands opposite point "E" and would not have any right to enter upon said island or the lands adjacent thereto for the purpose of making the proposed fill.

Eighth. John C. Crapser further answering the said petition, alleges that he owns the land in the bed of the river at point "A" as shown on Plate One of the petitioner's petition herein, and that the petitioners herein have no interest in the same; that they have never acquired any interests in the bottom of the river which would enable them to build a dam at point "A" as asked for in their petition, and that if said consent was granted, it would be a consent to build upon lands, the deeds of which are held by other parties than the New York & Ontario Power Company.

Wherefore said John C. Crapser prays that the petition of the New York & Ontario Power Company for approval of its plan to reconstruct, repair, and approve its dam, hydraulic structures and water power property at Waddington, St. Lawrence County, New York be denied.

All of which is respectfully submitted.

JOHN C. CRAPSER.

Dated June 22, 1918.

STATE OF NEW YORK,
County of St. Lawrence, ss:

John C. Crapser, being duly sworn, deposes and says that he is the person named in the foregoing answer to the petition of the New York & Ontario Power Company; that he has read the foregoing answer and knows the contents thereof and that the same is true to his own knowledge except as to the matters therein stated to be alleged upon information and belief and as to those matters he believes it to be true.

JOHN C. CRAPSER.

Sworn to before me this 25th day of June, 1918.

MARY G. DUFFY, *Notary Public.*

INTERNATIONAL JOINT COMMISSION

In the matter of the application of the New York and Ontario Power Company for approval of its plans to reconstruct, repair and improve its dam, hydraulic structures, and water-power property at Waddington-on-the-St. Lawrence, New York.

MEMORANDUM ON BEHALF OF THE STATE OF NEW YORK.

STATEMENT OF FACTS.

The Little River is a branch of the St. Lawrence River, running between Ogden Island and the main shore to the south. Sometime prior to 1808, David A. Ogden and his associates constructed a dam across the Little River from Ogden Island to the main shore at a point where now is situated the town of Waddington. After the erection of the dam and on the down stream side thereof, certain areas in the river bed were rendered dry or only covered with water to the depth of a comparatively few inches. At the time of the erection of the dam David A. Ogden and his associates were riparian owners on each side of the Little River at the points where the dam joined the upland.

In 1808, the New York Legislature passed an act which was approved by the governor and thereafter became, on April 1, 1808, chapter 121, laws of 1808. By virtue of this act the people of the State of New York granted to David A. Ogden and his associates the "full right, power, and authority to construct and make a canal," between Ogden Island and the main shore and to construct "in such canal, and in the waters and places adjoining the same, in addition to the dam already erected, all such locks, dams and other works and devices as shall be necessary for the purpose of making a complete navigable water communication."

The act further granted the right to "take the water which shall be contained within any lock, dam, pond, dyke, or other improvement made by them and make use of the same, * * * for mills or other works for which the use of water is necessary which may be erected or constructed by them * * *." Also to receive tolls from the vessels using the lock.

The act also provided that the rights and privileges granted by the act were limited to seventy-five years, after which time all the "powers, privileges, and advantages granted by it shall cease and determine." A further limitation of the rights granted is also found in the act, viz: that unless within three years a canal be completed, navigable by a vessel of fifty feet in length, ten feet in breadth, and of two feet draft of water, then all the rights granted should cease and determine. Two subsequent acts, chap. 31, laws of 1811, and chap. 81, laws of 1815, extended the period during which the canal might be built.

In 1826 the legislature passed a further act which was approved by the governor on April 17, 1826 (chapter 280, laws of 1826). The act recites that David A. Ogden is the proprietor of both sides of the branch of the St. Lawrence River and has erected "a dam and locks in pursuance of an act of the legislature of this State passed April 1, 1808," and further provides that David A. Ogden "shall and he is hereby declared to be vested with all the rights of the people

of this State to the lands situate below the said dam and which by reason thereof has been rendered susceptible of improvement and extending down the branch of said river from the said dam to the navigable waters thereof."

It also provided that after the expiration of the term of seventy-five years from the 1st of April, 1808, the people shall have the right to alter and regulate tolls to be charged for the use of the canal and locks.

A physical inspection made shortly before the hearing disclosed that various buildings, presumably mills of one kind or another, had been erected on various areas or islands immediately below the dam. These buildings or mills with one exception had fallen into disrepair and only the ruins and foundations remain at the present time.

The testimony showed that there existed, and probably had always existed, a navigable channel from the deep water found on the down-stream side of the shoals below the dam up along Ogden Island to the dam itself.

It appeared from the testimony of various persons that boats of considerable size were accustomed to enter the Little River from its westerly end and proceed down the said river to the town of Waddington to a dock that exists on the water front; that boats regularly navigated the lower reaches of the Little River below the dam to the shoals adjacent thereto; that at point A, indicated on Plate II filed by the petitioners, there was a depth of twelve feet of water.

The flow of the St. Lawrence River varies from 194,000 c. f. s. to 284,000 c. f. s. The average flow might be considered to be 250,000 c. f. s. The petitioners allege that the natural flow of the Little River, i. e., the flow before the construction of the dam and bridge, or causeway, was about one-tenth of the entire flow of the St. Lawrence River. At the close of the taking of testimony permission was granted to the State of New York to make a physical examination of the locus in quo for the purpose of obtaining data from which an estimate could be made by its engineers with respect to the natural flow of the Little River, with leave to apply to the commission to present the results of such investigation, should counsel for the State of New York deem it essential so to do.

POINT I.

As riparian owners, David A. Ogden and his associates did not acquire, as against the people of the State of New York, the right to erect and maintain a dam across the Little River from Ogden Island to the main shore.

If Ogden and his associates had no title to the bed of the Little River the erection by them of the dam in question was a trespass against the people of the State of New York until their acts were consented to by the act of 1808. The colony of New York brought with it the doctrines of the common law of England, and having acquired sovereignty, the rights and prerogatives, as well as the duties of sovereignty, thereby became vested in the people of the State of New York. Under the early English doctrine the sovereign owned the interior waters as proprietor. Grants carried with them title to the bed of the stream. These rights constituted the jus privatum.

Coincident with these there existed other rights, those incident to navigable streams, title being vested in the sovereign, not as proprietor, but subject to the public rights of navigation, fishing, etc. These were the jus publicum. Grants of lands bordering on navigable (so called exterior) waters carried title only to high-water mark. An arbitrary rule defining navigable waters was adopted, viz, those waters in which the tide ebbed and flowed. This was a reasonable rule because of the physical condition of the islands constituting Great Britain. Rivers and estuaries were, as a general rule, navigable only in those parts where the tide ebbed and flowed. These principles of private rights and rights held subject to a trust on behalf of the public have been universally recognized by the decisions of the courts of New York, and in the application of these principles to-day there is no confusion. Where difficulty has arisen and where there are apparent conflicts in the decisions is due entirely to the arbitrary definition of what constitutes navigable waters.

The English rule defining navigable waters as those in which there was a flow and reflow of the tide was, after all, but a rule of evidence, determined by the English jurists as a safe rule under the facts and circumstances there existing.

In their construction of the common-law principles inherited from the mother country the courts of New York found difficulty in applying the English rule with respect to navigable waters. As was said by Mr. Justice Davies in People *vs.* Canal Appraisers (33 N. Y., at page 472)—

> Lord Mansfield correctly said "Ex facto oritur jus," and it seems more rational to determine the question of navigability or unnavigability from the fact of navigation, or otherwise, than from a circumstance which may or may not be conclusive evidence of its navigability. The flow and reflow of the tide is prima facie evidence, as has been said, of the fact that the river is navigable, but the real and substantial inquiry must always be to ascertain whether the river is navigable or not. When this main and controlling fact is established, then we have means of determining whether the alveus or bed of the river is the property of the adjoining owners or belongs to the State, or the people represented by it.

New York has three great water highways, one lying entirely within its boundaries, viz: The Mohawk; the Hudson, an interior river except through its lower reaches where it forms the boundary between the States of New York and New Jersey; and, lastly, the St. Lawrence, entirely a boundary river. These three rivers are of great present importance and of infinite future value. The sovereign rights of the State in these rivers are similar. It was suggested during the oral argument that the rights of individuals in questions involving lands under the waters of the Mohawk and Hudson were governed by the early Dutch grants made as they were under the civil law. A careful reading of the cases will show that while in a number of instances the question of early Dutch grants, made under the civil law doctrine, was noted, their effect upon the decisions of the courts, broadly taken, was not controlling, because of the limitation in the grant itself, but the doctrine of the civil law, as affecting the test of the navigability and nonnavigability of streams was found by the courts to be more applicable to the conditions in the Mohawk and Hudson Rivers than the arbitrary rule of the common law of England limiting navigability to the flow and reflow of the tide, and the existence of early Dutch grants were cited as a further

or supporting argument and not the controlling fact in the case, the real test being navigability in fact. For, as has been frequently said judicially, in administering the common law the courts of New York were not limited arbitrarily to the English common law as it existed in 1875 but could and did apply only those principles which were applicable to the facts here found. (Meyers *v.* Gemmel, 10 Barb. 537, 541.)

Having, therefore, in view the fundamental principles as laid down by Sir Matthew Hale, of the jus privatum and the jus publicum, with the English common law rule of navigability modified by the different conditions here found and applying to these principles the test of navigability in fact, the principles governing the rights of riparian owners are clear and distinct to-day and difficult questions may be resolved by submitting them to the test of these principles and rule.

The question here for determination is, did the predecessors in title of the New York and Ontario Power Company, in 1808, prior to the act of the legislature, own the bed of the stream of the St. Lawrence River between Ogden Island and the main shore? If the St. Lawrence River was a navigable stream the title to the bed of the river was in the people of the State of New York.

In the early cases involving questions of the rights of riparian owners, the English rule with respect to the navigability of waters is given great weight. Historically the broadening of the doctrine is interesting. Thus, in 1826, one of the earliest cases (Ex parte Jennings, 6 Cowan, 516), the Supreme Court followed the English doctrine where a question arose affecting the rights of the riparian owner on Chittenango Creek, basing its decision on the common law rule that waters outside the ebb and flow of the tide must be considered nonnavigable in law.

This case was followed, in 1830, by that of The Canal Commissioners *v.* The People (5 Wendell, 420). This case was considered on a writ of error from the Supreme Court and was decided on the point that the claimant failed to show title to the premises injured, but the opinion of several of the members of the court seemed to indicate that they were inclined to follow the common law rule.

In 1836, the case again came up on a writ of error from the Supreme Court, and this time the rights of the riparian owner were clearly before the court and were determined. The court was divided, but the opinion of the majority held that the river was generally navigable and that the riparian owner did not take title to the bed of the stream. The various opinions are lengthy, but the gist of the decision has been well summed up by the Reporter in the following headnote (17 Wend. 571):

> If, in the improvement of the navigation of a public river, the waters of a tributary stream are so much raised as to destroy a valuable mill site situated thereon, and the stream be generally navigable, although not so at the particular locality of the mill site, the owner is not entitled to damages within the provisions of the canal laws directing compensation to be made for private property taken for public use.

The question arose over the appropriation of a mill site at the junction of the Hudson and Mohawk Rivers. The effect of the early Dutch grant is considered both by the chancellor in the minority opinion and by the senators in the majority opinion. A careful analysis

of the opinion, however, will show that the majority opinion was based upon the broad principle that the rivers were navigable in fact. Some of the conclusions arrived at by Senator Tracy are given in the note as follows:

1. That the great fresh-water streams of this country are not subject to the principle of individual appropriation allowed by the common law of England.

2. That the common-law doctrine that "fresh rivers of what kind so ever do of common right belong to the owners of the soil adjacent," is not of universal application in this State, and that the advocates of the doctrine themselves admit that there are exceptions to the rule.

3. That the reason of the rule assigning the proprietorship of the bed of a river to the owners of the adjacent shores wholly fails in reference to the large navigable rivers of this country.

* * * * * * *

8. That the Mohawk River, having immemorially been used for the purposes of navigation, is a public river and the riparian owner is not entitled to recover damages for the destruction of a mill site, in consequence of the water thereof being raised by the erection of a dam for the improvement of the navigation of the Hudson River, into which the Mohawk flows.

In this very case mention is made of the St. Lawrence River. Senator Tracy in his opinion, at page 622, says:

That the mere condition of rivers being fresh and not subject to the flow and reflow of the tide, does not of itself determine that the alveus or bed of them belongs to the riparian possessors, has to be admitted in respect to many rivers in this country, and to some in this State. The rivers Niagara and St. Lawrence, for instance, are acknowledged public rivers, in every sense, as much as if they were arms of the sea into which the tide flowed.

Thus, in 1836, there was no question in the mind of the learned senator, from whose opinion the above quotation was taken, that the St. Lawrence River, although beyond the reach of the flow and reflow of the tide, was public navigable water.

In 1852, the case of Gould *v.* Hudson River Railroad Company was decided, reported in 6 N. Y. at page 522, where the court of appeals held that the taking of land between high and low water mark along the Hudson River by a railroad company for a public improvement under charter of the legislature was namnum absque injuria.

The case was decided distinctly on the common law doctrine, the question of the modification of the English rule with respect to navigable waters not being here in question since the waters at the point in question were subject to the flow and reflow of the tide. The question of depriving the riparian owner of reasonable access was not raised, the action being brought to recover damages for the taking of the land. The learned court closes its opinion with the following language (page 544):

I will not pursue this subject further for it seems to me if any principle was ever settled this case (referring to the case of Lansing *v.* Smith, 8 Collin, 146, affirmed 4 Wendell, 9) settles the principle that the legislature has the right to regulate and control all navigable waters within the State and as in their judgment the interest and convenience of the public may require.

This decision is important as showing the trend of judicial opinion prior to 1852.

The Gould case was followed in 1859 by the case of the People *v.* Tibbetts, reported in 19 N. Y. 523. This is likewise a case deter-

mining the rights as between the State and an individual in lands along the Hudson River. The court held that the defendant, Tibbetts, was bound to pay certain rent, under a lease from the State, to his predecessors in title, of the right to use certain surplus waters at a dam erected by the State across the Hudson River, although the defendant, Tibbetts, claimed as a riparian owner, the individual right to the use of such waters. This case was also determined under the common-law doctrines. The court says, at page 526:

> If the Hudson River was, previous to the construction of the dam, a navigable stream at Troy, and there had been no grant of it by the colonial governors under the King of Great Britain, or the people, then it was the property of the people.

In conclusion, the court says, at page 528:

> It is beyond dispute that the State is the absolute owner of the navigable rivers within its borders, and that, as such owner, it can dispose of them to the exclusion of the riparian owners. In this case the State exercised its power of disposition in making the lease, and, consequently, such lease is valid.

In 1865, the case of The People *v.* The Canal Appraisers was decided (33 N. Y. 461). Mr. Justice Davies, in a most able and exhaustive opinion, reviews the decisions, not only of the courts of New York State, but also those of adjoining States and of the United States Supreme Court.

The learned justice concludes his opinion by pointing out that the Kempshall case (26 Wend. 404), apparently holding to the common law rule, was in reality decided under an express grant of the bed of the river, and closes with a vigorous statement in favor of the principles established in Canal Appraisers *v.* People (17 Wend. 571), referring to this case in the following words (p. 500):

> I am compelled, therefore, to regard the principles there enunciated as the settled law of the State and I have the less hesitation in so doing, as I believe that doctrine to be sound and impregnable and in accordance with the expressed will of the legislature and the early and uniform practice of the State, and the better decisions of the courts of this State and of other States and of the United States.

In 1914, in the Long Sault case (212 N. Y. p. 1), the court of appeals in dealing with the charter granted to the Long Sault Company says, in the prevailing opinion of Mr. Chief Justice Bartlett, at page 10:

> The point that I desire to emphasize is that the legislature can not authorize the conveyance of a navigable portion of the Saint Lawrence to a private company to maintain and control navigation thereon, thereby parting for all time with its own power to improve such navigation. The privilege of the State to control the Saint Lawrence as a navigable river (subject to the direction of Congress) can not be assigned to others in the manner attempted by this legislation.

This decision of the highest court of the State of New York clearly recognizes the Saint Lawrence as a navigable river despite the English common law rule of evidence with respect to the flow and reflow of the tide.

In the Long Sault case, the court held the charter void because it, in effect, allowed the company to exercise control over navigation, an incident of sovereignty that could not be granted to a private corporation. Mr. Justice Collin dissented from this construction of the charter, while agreeing with the underlying principles with respect to navigable waters in the St. Lawrence River. Portions of his

opinion are very illuminating as showing the general tendency of the courts to depart from the old English common law rule. He says at the bottom of page 17 and top of page 18:

> I take judicial notice that the St. Lawrence River is navigable and a boundary between the United States and the Dominion of Canada. The title of the State to that part of it southerly of the boundary line between the two countries is, properly, not questioned by any party. The riparian owners did not have title to it, because the rule of the common law of this State (enlarging or extending that of England) that the title to the bed of navigable rivers, not tidal, is in the owners of the adjacent banks, is not applied to rivers constituting the boundary lines between nations. (Citing cases.)

At page 21 he further says:

> The people of the States are the beneficial proprietors of the St. Lawrence River. The usufruct of it belongs to them and can not be granted or destroyed by the legislature. It does not exist, however, solely in the common right of navigation. Other uses may promote the public welfare and prosperity and make the usufruct more valuable, although they are inconsistent with and a curtailment of free and unimpaired navigation.

The United States Supreme Court has consistently supported the doctrine that the title to lands under all inland waters navigable in fact was in the State within whose boundaries the waters lie, or in its grantees and that the doctrine of the flow and of the reflow of the tide as determining the navigability of the waters, was not controlling. (U. S. *v.* Chandler-Dunbar W. P. Co., 229 U. S. 53; Illinois Central Railroad *v.* Illinois, 146 U. S. 387; Blue Point Oyster Company *v.* Briggs, 198 N. Y. 287, affirmed in 229 U. S. 82.)

In the Illinois case the court says, at page 436:

> But in this country the case is different. Some of our rivers are navigable for great distances above the flow of the tide; indeed, for hundreds of miles, by the largest vessels used in commerce. As said in the case cited: "There is certainly nothing in the ebb and flow of the tide that makes the waters peculiarly suitable for admiralty jurisdiction, nor anything in the absence of a tide that renders it unfit. If it is a public navigable water, on which commerce is carried on between different States or nations, the reason for the jurisdiction is precisely the same * * *"

It is exactly this doctrine so clearly stated that leads me to argue most vigorously that the cases under which property rights were determined along the Hudson and Mohawk Rivers are pertinent and controlling, irrespective of any influence exercised by reason of grants made by the United Netherlands along these rivers.

The principle of navigability in fact, as more truly applicable to the conditions of our great rivers and of the rights of the public therein than the English common law rule, was recognized from the earliest times by the State courts and by the Federal decisions. It was the rule of reason as contradistinguished to the rule of precedent.

During the oral argument one of the honorable commissioners called attention to the case of Smith *v.* City of Rochester (92 N. Y. 464), as enunciating a doctrine contrary to that here asserted. The questions there determined were the property rights of the plaintiff, certain mill owners in a nonnavigable stream. Mr. Chief Justice Ruger, at page 473, says:

> The State by virtue of its sovereignty is deemed the original grantor of all titles to real estate and the conveyance by it of riparian rights upon nonnavigable streams vests its grantees, both immediate and remote, with all the rights which such owners can acquire against any grantor.
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> * * * * * * *

The plaintiffs have shown title to the several premises occupied and enjoyed by them as mill-owners upon the banks of a nonnavigable stream, which entitles them to the uninterrupted flow of its waters in the channel of the stream contiguous to their respective premises as it has been accustomed to flow.

We have here, therefore, a grant from the State of the lands under the navigable waters in question.

It is true that in this case also was the question of the right of the city of Rochester to divert the waters of Hemlock Lake, a small but navigable body of water, for a public use. Such use, however, would have destroyed the vested private rights of the mill owners in the small outlet, a non-navigable stream. A further important and probably controlling point must be noted. Hemlock Lake, and the soil under it, was included in the lands granted by the State of New York to the State of Massachusetts, under the settlement of 1786, whereby New York—

By formal deed, ceded, granted, released and confirmed to Massachusetts the estate, right, title, and property (the right of government, sovereignty and jurisdiction excepted).

* * * * * * *

By a legislative act of Massachusetts, the territory was in 1778 granted to Phelps and Gorham, and became in every sense private property. (Kempshall Case, 26 Wend, at p. 420.)

In the case of the Fulton Light, Heat and Power Company *v.* State of New York (200 N. Y. 400), wherein certain property rights were determined with respect to the bed of the Oswego River, the court held that the Oswego River at the locus in quo was a non-navigable stream.

There is one further query that may legitimately be made at this point. The dam placed across the Little River by the grantors of the New York and Ontario Power Company is not placed across the whole of the St. Lawrence River, but only across one branch of the same. Does this fact change the rules that should govern, or determine the rights of the riparian owners to the bed of the so-called Little River?

It is contended that through the Little River flows approximately one-tenth of the volume of the St. Lawrence River. It was shown by the testimony that the same was navigable through its upper reaches for a considerable extent and also navigable from below up to within a short distance of the dam. It is a fair inference from the early grant of 1808 that the Little River was navigable for boats at that time; in fact, the act itself provides the character of the boats that were to be locked past the dam. From the earliest times the St. Lawrence River was used by the bateaus of voyageurs, and there can be no question but that the branch known as the Little River was the customary highway avoiding, as it did, the long and turbulent waters of the Rapide Platte. The very treaty itself under which the honorable the International Commission was formed defines the boundary waters as from "main shore to main shore." In view of this, it would seem that it were neither logical nor sound in principle or equity to assume that, because above the head of Ogden Island the waters of the St. Lawrence River parted, flowing partly to the north and partly to the south around Ogden Island, in a volume to the south estimated by the petitioners to be in the neighborhood of 25,000 c. f. s. a different rule of law and different principles of

property apply to one branch than to another. Followed to its logical conclusion there could be no certainty then of the rights of the people of the State or the riparian owners with respect to those parts of the St. Lawrence River that did not border upon the main channel. It would also be contrary to the established principle that on navigable waters the rights of a riparian owner run to the high-water mark and no further. There must be certainty; there must be a fixed point, because property rights must be fixed; must be certain.

In conclusion on this point; it must be clear that the great weight of judicial decision, setting aside all local influences, has been to declare that in non-navigable streams riparian owners acquire title to the thread of the stream; that on navigable streams the title of the riparian owners to the soil ceased at high water mark, giving to them, however, certain rights of access, &c., to the stream; that the title to the soil under navigable streams was in the State, subject to grant for a public use, subordinated, so far as the individual States are concerned, to the dominant right of the Federal Government to control navigation; that the old English rule for determining navigable waters, viz., waters wherein the tide flows and reflows, has been abrogated for the broader principle of navigability in fact; that the St. Lawrence River is, in fact, and has been declared to be in law a navigable stream and that the riparian owners on the St. Lawrence River and at the locus in quo took title only to high water mark.

POINT II.

The rights and privileges granted to David A. Ogden and his associates under the act of 1808 (Chap. 121, Laws of 1808), ceased and determined at the end of a period of seventy-five years by express limitation.

This act expressly grants to Ogden and his associates the right to construct a canal in the waters of the Little River. It recognizes the fact that a dam had been theretofore erected and in effect ratifies or licenses the erection of the dam in the words—"and to construct in such canal and in the waters and places adjoining the same in addition to the dam already erected, all such locks, dams and other works and devices as shall be necessary for the purpose of making a complete navigable water communication between the said island and the American side of the said river."

So far the purpose of the act is clearly that of benefiting navigation. Proceeding, it conveys other rights and privileges, viz:

> And that they, their hears and assigns may take water which shall be contained within any lock, dam, pond, dyke, or other improvement made by them and make use of the same * * * for mills or other works for which the use of water is necessary which may be erected or constructed by them.

The act further grants permission to collect tolls, provides that the canal must be built within three years and then sets forth the following express limitation:

> *And be it further enacted*, That the duration of this act is hereby limited to seventy-five years, after which time all the powers, privileges, and advantages granted by it shall cease and determine.

The rights and privileges granted under this act may be, as indicated above, divisible into two general groups: (*a*) That of the construction of a canal and a lock in the dam, and (*b*) the right to take water from the pond created above the dam. If the applicant's contention is sound, that as riparian owner it had a right to construct the dam, the act of 1808 was clearly unnecessary. If David A. Ogden and his associates were the owners of the soil of the Little River and in their right as proprietors erected the dam, the right existed to make a breach in the dam by way of a lock and to improve any channel or canal that might be necessary to further the navigation of their private waters. If they erected the dam as proprietors, it required no legislative authority to withdraw water from the pond above the dam. The existence of the act itself is absolutely inconsistent with the theory that David A. Ogden and his associates as proprietors, of their own right, maintained and constructed a dam across the Little River.

The logical effect of the passage of the act of 1808 was a consent, on the part of the people of the State of New York, to the existence of the dam for a period of seventy-five years and a grant from a sovereign to a riparian owner, whose rights in the soil ceased at high water mark, to construct a canal, a lock, and other works necessary for the improvement of the existing navigation of the Little River. It granted also to the riparian owner the right and privilege to use the waters impounded by said dam for manufacturing purposes. The act provided its own statute of limitation and recognized and legalized the existence of the dam, and the rights and privileges granted, ceased, and determined at the end of seventy-five years.

POINT III.

The effect of the act of 1826 (Chap. 280 of the laws of 1826).

To appreciate the act of 1826 it is necessary to visualize the conditions existing at Waddington at that time. The act of 1808 required that the canal, locks, etc., should be built within three years. This had not been done. An extension of three additional years was obtained by Chap. 31, Laws of 1811, and a second extension of a further three year period was granted. In all probability, therefore, the canal and locks were not completed until 1817.

A physical examination of the areas in the bed of the river on the downstream side of the dam at the present date (see N. Y. Ex. 1), shows that the erection of the dam caused certain portions of the river bed, on the downstream side of the dam, to become bare or to be covered with only a few inches of water creating certain islands and reefs and that upon these islands or reefs, immediately along and below the dam, various mill structures had been erected. Nothing remains of these at the present day except the foundations and ruins, but these foundations and ruins clearly disclose the character and situs of the buildings.

The use of power developed by water, in 1817 and 1826, was by the direct application of the fall of water to the old fashioned water wheel, necessitating the erection of the mill in close contact with the falling water.

In 1826, David A. Ogden and his associates petitioned the Legislature of the State of New York, presenting their petition, as was then the custom, to the senate. The petition is not in existence, but the report of the chairman of the committee on the judiciary, to whom the petition was referred, is in existence and has been offered. (N. Y. Ex. 4.) Its recitals are important as assisting in visualizing the conditions at that time.

The following significant facts appear from this report. The petitioners represent—

1. That they were authorized to erect a dam or lock by a State statute in 1909. This date is clearly an error and reference to the act of 1808 is intended.
2. That the rights granted were for seventy-five years.
3. That rafts formerly were floated down this branch of the river.
4. That below the dam there is a space not covered with water at low water periods.
5. That petitioners claim title to the bed of the stream, "but apprehend that doubts may be entertained on this subject."
6. That certain manufactories have been and are being erected below the dam.
7. That it had been represented that the lock was "on the lands of the petitioner, and does not occupy any part of what was the natural bed of the river."

We now turn to the act of 1826, being chap. 280 of the laws of that year. It is significant that the act recites—

> David A. Ogden, of the county of St. Lawrence, being the proprietor of both sides of a branch of the River St. Lawrence in the town of Madrid, and across which river he has erected a dam and locks in pursuance of an act of the legislature of this State passed April 1, 1808.

Here we have a clear recognition, in the act of 1826, that the dam, as well as the locks, was erected in pursuance of the legislative act of 1808. The act further provides that David A. Ogden—

> Shall be and he is hereby declared to be vested with all the rights of the people of this State to the land situate below the said dam and which by reason thereof has been rendered susceptible of improvement, and extending down the branch of said river from the said dam to the navigable waters thereof.

The prayer of the petition was that the bed of the entire river between Ogden Island and the main shore should be granted to the petitioners. This, clearly, was not granted. A perusal of the act would also indicate that the words "and which by reason thereof has been rendered susceptible of improvement," were interpolated after the act was drawn and were for the purpose of further limiting the lands granted pursuant to the act. These words, considered in the light of the conditions existing at the time, as already indicated, namely, that the mills and other structures were being built in the bed of the river below the dam, are extremely significant and clearly limited the title to the lands granted to those areas below the dam which "by reason thereof were susceptible of improvement," i. e. those lands occupied or to be occupied by the erection of mills dependent for their being and existence upon the presence there of the dam and the water power thereby developed.

We understand that it has been argued that because the act of 1826 further provides—

> That nothing contained herein shall operate to prevent the people of this State, at the expiration of the term of seventy-five years from the first day of April, one thousand and eight hundred and eight, to alter and regulate the tolls on boats passing said locks as they in their discretion may deem proper;

that this, in effect, recognized a right in perpetuity in David A. Ogden and his associates to maintain a dam across the Little River. There seems no plausible ground for such a conclusion, but whatever doubt might be thrown about these words is elucidated by turning again to the report of the chairman of the judiciary committee (N. Y. Ex. 4), for in this report we find an express reference to a claim that the canal in question is built not in the bed of the river, but through the private lands of David A. Ogden and his associates.

The effect of the act of 1826 was, at most, to convey to David A. Ogden and his associates such title to the bed of the Little River, immediately below the dam, as was necessary for the erection of their mills and structures. Whether that grant was in perpetuity or in effect merely a fee conditioned upon the existence of the dam, is not material since it clearly did not convey to them an absolute fee in the bed of the Little River from Ogden Island to the main shore.

POINT IV.

In the construction of grants from a sovereign to a private individual the general rule of construction with respect to deeds is reversed and any doubts are resolved in favor of the grantor and against the grantee.

Mr. Justice Vann, in the case of Lewis Blue Point Oyster Co. *v.* Briggs, 198 N. Y., at page 292, clearly states the rule.

> In patents from sovereign to subject the rule of construction which controls deeds between individuals is reversed and the terms are taken most strongly against the grantee, because the public interest is involved. For the same reason it is held that from grants of water land there is impliedly reserved the right of navigation, and, as a necessary part to so important a subject, the right to improve navigation for the benefit of commerce.

See also Gould on Waters (3 ed.) § 36, p. 86.

The application of this rule to the act of 1826 is of material assistance in determining the rights acquired thereunder by David A. Ogden and his associates and I believe that it may be confidently asserted that under the said act David A. Ogden and his associates did not acquire title in fee to a strip of land which included the entire bed of the Little River bounded to the west by the dam, to the east by the navigable waters of the Little River, to the north by Ogden Island, and to the south by the main shore, but only acquired such title to lands within these boundaries " which by reason thereof (the dam) had been rendered susceptible of improvement."

POINT V.

The question of the title of the applicant to the lands under water which they seek to occupy is properly before the commission.

It is fundamental that the machinery of the International Joint Commission should not be set in motion by a stranger to the locus in

quo. The obligation is therefore upon the petitioner to show that its title to the lands upon which its structures are to be erected is within it or under its control. The commission, by its decision, may not oust the State of New York from its rights, nor may it grant to the petitioner rights in property which it does not possess. But it is inconsistent with the broad powers granted to the commission under the treaty to ignore the question of title when the same is asserted and controverted. It has, therefore, been deemed a proper duty to lay before your honorable commission the position of the State of New York with respect to the title of the lands in the bed of the Little River occupied or designed to be occupied by the petitioner.

From another point of view, it is also of vital importance that the State of New York should lay before the International Commission the question of its rights and interests in the premises. Its rights are determinable before its judicial tribunals but a very great interest that exists has not as yet been clearly defined.

Mr. Justice Collin, in the Long Sault case already referred to, 212 N. Y. at page 21, says:

> The people of the State are the beneficial proprietors of the St. Lawrence River. The usufruct of it belongs to them and can not be granted or destroyed by the legislature. It does not exist, however, solely in the common right of navigation. Other uses may promote the public welfare and prosperity and make the usufruct more valuable, although they are inconsistent with and a curtailment of free and unimpaired navigation.

While to the Dominion of Canada, lying north of the St. Lawrence River its value as a navigable stream is perhaps the most important question involved, to the State of New York with its other means of transporting its commodities from the interior to tide water the St. Lawrence River is of infinitely more importance as the source of the development of hydraulic power and it is this interest, as yet in a formative stage, that must not be ignored.

While the latent powers in the swift-running waters of the St. Lawrence have there existed since it first carried the waters of the great inland seas to the ocean, only within the past few years has modern science so advanced the arts that these latent powers are now capable of being harnessed and made to give their usefulness to man in such a degree of efficiency that they have become a necessary part of the scheme of industrial life.

Primarily the public interest in public waters, jus publicum, was largely that of navigation. The law as we have it to-day, except as modified by conditions already noted, comes to us from the common law of England where the great interests were those of marine commerce. The foundation of England's greatness was and is still built upon its ships and dependent upon the navigable waters surrounding its coast and leading into its harbors. We inherited our doctrine of public rights from England and took with those rights the same elements of commerce and interchange of commodities.

At first certain different conditions and different rights in the public waters of the State were little understood and of small importance. They were dormant, awaiting the development that came with more intensive life and greater population; the use by the public of its rights in navigable waters—originally the small boat propelled by the oar or paddle; then the larger vessels by sail, and with the coming of steam, the development of steam power and the steam-

ship. Followed then the great use of fuel and the drain upon our forests and coal fields. As these sources of supply are not limitless the eyes of men naturally turned to other sources of power and in the rushing waters of the rivers they found a source of power which, while known, could not be brought to industrial efficiency until the development of electricity and all that it means.

When the common law principle of protecting the rights of the public in navigable waters was in its formative state, the possibility of power development was not within the mind of man. But the principles of protection of public rights in public waters was broad enough to meet the conditions to-day if applied in their purity and original strength. They are just as sound and true to-day as they were then and this is so because of their inherent truth and equity. To-day the State can no more part with the rights of the public with respect to the use of hydraulic power in the public waters of the State, without due consideration of the interests of the public therein, than it can allow the construction by a railroad company of vast docks in the navigable waters of Lake Michigan as was prohibited in the Illinois case, or the absolute control of navigable waters as was forbidden in the Long Sault case. These rights of the people in and to the latent power in these public waters are no different from the public right of navigation and it must be recognized.

POINT VI.

The application of the petitioner should be denied, unless it shall present to the commission satisfactory proof that the consent of the State of New York to the project has first been obtained.

October 29, 1918.
Respectfully submitted.

MARSHALL MCLEAN,
Special Deputy Attorney General,
of Counsel for the State of New York.

INTERNATIONAL JOINT COMMISSION.

Application of the New York and Ontario Power Company for approval of its plants to reconstruct, repair, and improve its dam, etc.

APPLICANT'S BRIEF.

FACTS AND LAW.

This is an application of the New York & Ontario Power Company for leave to reconstruct or repair its dam and improve its forebay in what is known as the Little River at Waddington-on-the-St. Lawrence, N. Y. Permission is also sought to construct an embankment from Ogden to Canada Island and a submerged weir or fill near the head of Ogden Island below navigation depth. The embankment and weir are in the nature of compensatory works. It is claimed the embankment will improve navigation by eliminating a

strong side draft current which is now a menace to the same. The weir is designed to maintain the level at the entrance to the canal on the Canadian side. In consideration of these benefits applicant requests that it be allowed to divert sufficient water above the natural flow to maintain a uniform flow of thirty thousand (30,000) cubic feet per second, when such diversion will not be detrimental to the interests of navigation in the north channel.

The New York & Ontario Power Company is a public service corporation duly organized under and pursuant to the laws of the State of New York and by mesne conveyances it has acquired from the original owners all the waterpower properties, rights, and privileges at said place.

Certificate of Incorporation, Ex. A–1.
Order Gas & Electricity Commission, Ex. A–2.
Testimony Cleaveland, p. 272–283.
Deed Allison et al. to New York & Ontario Power Co., et al., Ex. A–4–9.

OGDEN ISLAND.

Ogden Island lies in the St. Lawrence River abreast of Waddington-on-the-St. Lawrence. It lies south of the international border line. The Little River flows between this island and the American shore. The main channel of the St. Lawrence flows between Ogden Island and Canada on the north. We are therefore dealing with a situation wholly within the United States.

The Little River in its natural state was nonnavigable in fact. Upstream navigation for boats or vessels was impossible; and downstream navigation was confined to rafts and then "generally with loss."

This is evident from the language of the act of the legislature canalizing the stream (ch. 121 L. 1808), and from the report of the journal committee when the legislature in 1826 had under consideration the act confirming in Ogden the lands downstream from the dam in question. (Ex. N. Y. 4.) This is also apparent from the existing physical condition of the river bed.

DAM.

The dam in question was originally constructed about 1803 by Messrs. Waddington-Ogden, and associates (hereinafter called Ogden.) They were riparian owners of the lands on either side of the stream. They owned Ogden Island and the main lands on the American side.

The dam crossed the Little River from the American shore to Ogden Island. This dam has been constantly used ever since and maintained for power purposes. About one-tenth ($\frac{1}{10}$) of the total flow of the St. Lawrence River passes down the Little River in its natural state. While the natural flow of the Little River is, perhaps, involved in some doubt, owing to the difficulty of ascertaining natural conditions, the evidence before the commission fully justified our claim as to the extent of the natural flow. (Ex. 21, Plate II; testimony Lea.)

NATURAL FLOW.

The applicant insists that it is entitled to the use of such natural flow, subject only to the paramount right of the United States Government to regulate the same in the interest of commerce. This contention is based upon the ground (1) that the dam was originally constructed by riparian owners; (2) that in the year 1808 the Legislature of the State of New York passed an act canalizing the stream and authorized the owners of the dam (Ogden) to use water for power purposes and to charge tolls entitled "An act for opening and establishing lock navigation in the River St. Lawrence;" (3) thereafter, in 1826, the legislature confirmed in Ogden the title to the lands down stream from the dam susceptible of improvement * * * to the navigable waters thereof (St. Lawrence). Ogden complied with every provision of the legislative acts, constructed necessary locks, and established navigation up and down stream, which continued until the Canadian Government built its canals about the year 1850.

The dam is now out of repair, many of the mills formerly in operation have been abandoned, destroyed or fallen into disuse. At present a small part only of the natural flow of the stream is used for industrial purposes. The company proposes to repair or reconstruct said dam and hydraulic works, improve the forebay by making excavations therein so that the water which this commission permits applicant to divert may be used to the highest degree of commercial efficiency.

OBJECTIONS.

Objections have been interposed to this application by the Canadian Government and others. Summarized the objections are that this application be denied for the reason that the proposed improvement of the property of the company may possibly be detrimental to navigation. This in effect is the position of the Canadian Government. It contends, in substance, that the New York & Ontario Power Co. now diverts but a small portion of the natural flow of the stream, but in case improvements are made it proposes to divert the full natural flow plus a small amount of additional or supplementary waters to maintain a uniform flow if permitted to do so by this commission. This will tend to lower the level of the water in the north channel, and at the lock gates at the entrance to the canal on the Canadian side, which may in extreme low water impede navigation to a limited extent at very rare intervals.

This is practically the summation of the other objections, although the State of New York contends that it is the owner of the bed of the Little River, and therefore, the New York & Ontario Power Co. should be denied any rights in the same; notwithstanding the fact that this company and its predecessors in title have used and enjoyed this valuable water power rights and privileges for a period of one hundred years and upwards. These objections in one view deny that the New York & Ontario Power Co. has any right in the Little River, and in another view it seems to concede that this company is entitled to the use of the natural flow of the stream, but contends that this natural flow is less than claimed by the applicant.

AS RIPARIAN OWNER OGDEN POSSESSED WATER-POWER RIGHTS AND PRIVILEGE SUBJECT TO THE PUBLIC RIGHT OF PASSAGE.

As above stated, Ogden built this dam about the year 1803; he was then the riparian owner; he owned the island and the main land at the time; he claimed title to the bed of the stream. It was nonnavigable in fact. As a riparian owner under these circumstances he had the right to the reasonable use of the water, subject only to the right of navigation in the public. The rule of law then was, and still is, that the owner of the upland adjacent to a stream nonnavigable in fact or in law has the right to use the waters thereof so far as the same can be enjoyed without interfering with the easement of navigation. In such streams the public right to use same for passage and the private right to use same for power was coequal.

The term navigable, as then understood, meant waters where the tide ebbs and flows; all other streams were nonnavigable. The Little River was an inland fresh-water stream; moreover, it was nonnavigable in fact, as well as in law as understood at that time. The rule applicable then was that the riparian owner on such a stream had title to the bed of the river.

UNDER RULE PREVAILING WHEN DAM WAS BUILT OGDEN AS RIPARIAN OWNER HAD TITLE TO BED OF LITTLE RIVER, SAME BEING AN INLAND FRESH-WATER STREAM NONNAVIGABLE IN FACT OR LAW.

The original grant was bounded by the stream and, therefore, in nonnavigable waters the owner of the upland took title to the thread of the stream. The grant to the applicant's predecessors in title, after giving the courses and distances, reads as follows:

To the River St. Lawrence, and then down along the same to the place of beginning.

In nonnavigable, that is, nontidal stream, such a grant carries title to the bed of the stream. This precise point has been recently decided by the court of appeals of the State of New York.

The question involved was the title to the bed of the Oswego River—this is a fresh water inland stream, nonnavigable in fact in certain stretches thereof; in every way comparable to the Little River. In that case, as in this, the State claimed title to the bed of the stream by virtue of its original ownership; the riparian owner claimed title by virtue of a grant to its predecessor in title. The description contained in the grant on the Oswego was as follows:

From a white-ash sapling * * * standing on the east shore of the Oswego River, by courses, to the east; to the north; to the west * * * to the said river, and then up along the same to the place of beginning.

It will be observed that the description is almost identical with the language used in the grant of the predecessors in title of this applicant.

In discussing the subject, the court says:

This grant should be construed as to its descriptive language, as would any ordinary grant of property. Being presumed to have made for a sufficient consideration, there is no reason for construing it wtih any extraordinary strictness as against the grantee. It is not like a legislative grant for some exclusive franchise, or privileges, where the rule of a favorable construction to

the State will be rigidly applied. As the boundary of the grant is on a fresh-water river, the location of the monument for the starting point in the sapling is not a delimitation of the westerly boundary line. * * * It is an old and well-settled rule, where the grant has no other boundtry on the river side but the stream itself, that the legal presumption is that it was intended to convey to the middle of such stream (Fulton L. H. & P. Co. *v.* State of N. Y., 200 N. Y., p. 400–416.)

This same case lays down the rule with reference to title to the bed of the stream. It is in complete accord with many other decisions and holds that the common-law rule of England has been adopted in this State, with respect to the so-called tide waters only; in such waters the title to the bed is in the State, subject, of course, to the right of the public to use such waters for navigation purposes. In all fresh waters, whether navigable in fact or not, the title to the bed is in the riparian owner, subject, of course, to like right of navigation in the public. This is the rule to which the court says that there are some exceptions, and mentions the Hudson above the ebb and flow of the tide; the Mohawk River, a fresh-water stream. With regard to these exceptions the court says:

The part of the Hudson River above the ebb and flow of the tide, and the Mohawk River, a fresh-water stream, in grants made to settlers under the Dutch Government, were excepted, and, upon the English succession, the beds of those waters never having been conveyed, vested in the Crown, as lands not therefore granted. As to those rivers, the people of this State have ever asserted title as to unapportioned lands. (Fulton L. H. & P. Co. *v.* State, 200 N. Y., p. 400-414.)

TITLE TO BED FRESH-WATER INLAND STREAMS DEPENDS ON LAW OF STATE—IN NEW YORK STATE TITLE IS IN RIPARIAN OWNER UNLESS SPECIALLY EXCEPTED.

With respect to the title to the bed of fresh-water streams—that is, nontidal—the State of New York has adopted the English rule, to the effect that the title to the bed is in the riparian owner. The Hudson and the Mohawk are exceptions for the reason stated above. All the States have not adopted the English rule in this respect. Justice Gray, U. S. Supreme Court, in the case of Shively *v.* Bowlby (152 U. S., p. 1), has discussed at great length the decisions of the various States with respect to the ownership of lands in fresh-water rivers and lakes. He reaches the conclusion that the rule applicable in each State governs the title to lands in such waters. He has summarized the rule as follows:

At common law, the title and the dominion in lands flowed by the tide were in the King for the benefit of the nation. Upon the settlement of the Colonies, like rights passed to the grantees in the royal charters, in trust for the communities to be established. Upon the American Revolution, these rights, charged with a like trust, were vested in the original States within their respective borders, subject to the rights surrendered by the Constitution to the United States (p. 57).

With respect to inland waters, Justice Gray says:

Upon the question how far the title extends of the owner of land bounding on a river actually navigable, but above the ebb and flow of the tide, there is a diversity in the laws of the different States. * * * The title and rights of riparian or littoral proprietors in the soil below high-water mark are governed by the laws of the several States, subject to the rights granted to the United States by the Constitution.

In other words, the common law of England has been adopted in the United States with respect to tide waters; but with respect to nontidal streams and inland waters the rule is governed by the lex loci. The law of the State prevails; therefore in the State of New York the rule laid down in Fulton L. H. & P. Co. case, supra, is the rule applicable to all inland waters in this State not actually excepted for some good and sufficient reasons.

The confusion or, perhaps, lack of uniformity among different States is due largely to the definition of navigable streams. In England fresh-water streams were not considered navigable; the same rule has been applied in some of the States. It was many years before the admiralty courts assumed jurisdiction over maritime questions on fresh-water lakes and rivers. The Supreme Court of the United States in 1851 first finally adopted the rule that admiralty jurisdiction—based largely upon the definition of navigability—extended to our inland waters and all conflict of opinion which had theretofore existed was set at rest in the case of The Propeller Genesee Chief et al *v.* Fitzhugh et al (12 How. Rept. 443).

That case arose on account of a collision on Lake Ontario, and the United States Supreme Court then for the first time held that the admiralty laws covered inland waters, on the ground that the same was navigable in fact, though not navigable in law under the English rule. The term navigable was defined with respect to the public use therein; when a stream was navigable in fact, the public was said to have a right therein for navigation purposes; when a stream was nonnavigable in fact then the courts held that the stream was private and that the public had no interest in the bed thereof or otherwise. What streams were public and what streams were private, were questions concerning which the lower courts of our State disputed and disagreed for a good many years. At last the Court of Appeals laid down a rule which was reasonably definite. In the year 1866 Judge Smith, in the case of Morgan *v.* King (35 N. Y., 454) discusses the right of the public in inland waters, and stated that—

> The public have a right of way in every stream which is capable, in its natural state and its ordinary volume of water, of transporting, in a condition fit for market, the products of the forest or mines, or of the tillage of the soil upon its banks. * * * Such capacity need not be continuous. If it is, ordinarily, subject to regular periodical fluctuations, attributable to natural causes, * * * it is subject to the public easemen (p. 459).

The court had under consideration a stretch of the Racket River within a few miles of its mouth, and held that it was private because it was found nonnavigable in fact. The Racket River is one of the largest fresh-water streams in the State of New York, excluding the Hudson and the St. Lawrence.

When the dam was built the Little River was an inland stream, wholly within the State of New York. It was not navigable in fact, even under the fairly liberal definition of Morgan *v.* King; the proof is that vessels could not navigate this river in its natural state; there was absolutely no boat navigation upstream or downstream; only rafts occasionally went down but they were "generally lost." Therefore within the contemplation of the law at that time the stream was nonnavigable in fact and consequently the title to the bed was in the riparian owner.

LATER DECISIONS LEAVE TITLE TO BED OF LITTLE RIVER IN SERIOUS DOUBT.

It is admitted that the courts have stated in some cases that the bed of the River St. Lawrence is in the State; it has been put upon the ground that it is an international boundary stream. The famous Long Sault case so states; nevertheless, there is no decision which holds that the bed of the stream in the Little River belongs to the State. We frankly admit that if this question was before the court at this time, the decision might possibly be that the title to the bed of the Little River is in the State, except so far as the same has been granted to our predecessors in title, but had the courts passed upon the question in the year 1803, when this dam was built, the courts would without doubt have decided that the title to the bed was in the riparian owner within the precedents then governing our law to the effect that the bed of the stream in all inland nontidal nonnavigable waters was in the riparian owner. It is evident that this was the fixed opinion of the owner, and the State, itself, was evidently in doubt, as appears from the report of the judiciary committee of the legislature when it had before it a bill confirming in Ogden the ownership of the bed of the stream to quiet Ogden's title thereto.

RULE OF INTERPRETATION OF LANGUAGE OF GRANT APPLIES TO INTERNATIONAL BORDER STREAMS.

Further light is thrown upon the question of the title to the bed of streams like this by the decision of the U. S. Supreme Court, in the case of U. S. *v.* Chandler-Dunbar Co. (229, U. S. Rpt. 4, p. 53.) The question there arose with reference to the right of Federal Government to improve St. Marys River for navigation purposes. The Chandler-Dunbar Co. claimed title to the bed of the stream and maintained that Congress was without power to appropriate the same for navigation purposes. The company admitted that the United States had the right to utilize the stream for navigation purposes, but claimed that the water in excess of the needs of navigation was property belonging to the company and should be paid for. The opinion says:

"The technical title to the beds of navigable rivers of the United States is either in the States in which the rivers are situated or in the riparian owners, depending upon the local law. Upon the admission of Michigan as a State into the Union the bed of the St. Marys River passed to the State; under the law of Michigan a conveyance of land bordering upon a navigable river carries title to the middle thread." Under such grant the Chandler-Dunbar Co. became the owner of the bed.

St. Marys River was a boundary stream the same as the St. Lawrence, at Waddington, and the title to the bed went to the riparian owner by virtue of the terms of the grant. The language of the grant was the same as that to the original grant at Waddington.

The opinion further held with regard to the rights of a riparian owner:

The title of the riparian owner to the bed of a navigable stream is a qualified one, and subordinate to the public right of navigation and subject to the absolute power of Congress over the improvement of navigable rivers.

In other words, the rule of law in Michigan is, that even in boundary waters the title is in the riparian owners under a grant

like ours. It also holds that the title to the bed of navigable rivers is a bare technical title, and subject to the public right of navigation. This is true whether the title to the bed is in the State or in the riparian owner.

RIGHTS OF RIPARIAN OWNERS IN STREAMS LIKE THE LITTLE RIVER.

Without regard to the question of the title to the bed of the Little River, it will be recalled, that Ogden was the riparian owner at the time the dam was built, about the year 1803; as such he was entitled to certain rights incident thereto, and not depending upon the ownership of the soil. Riparian owners have greater rights in navigable streams than the general public. The Supreme Court of the United States in Chandler-Dunbar Co. case discussed this question, and in the course of its opinion states:

> That riparian owners upon public navigable rivers have, in addition to the rights common to the public (navigation), certain rights to the use and enjoyment of the stream which are incident to such ownership of the bank, must be conceded. These additional rights are not dependent upon title of the soil over which the river flows, but are incident to the ownership upon the bank. Among these rights of use and enjoyment is the right, as against other riparian owners, to have the stream come to them substantially in its natural state, both in quantity and quality. They have also the right of access to deep water * * * and may construct for this purpose wharves, docks, and piers in the shallow water of the shore. But every such structure in the water of a navigable river is subordinate to the right of navigation. (U. S. *v.* Chandler-Dunbar Co. 229 U. S., p. 53–70.)

Riparian owners on our inland streams, when the title to the bed thereof is not disputed, have universally exercised the right of constructing dams across the same in order to utilize the fall of water for power purposes. In this State they have never been denied that right, though the courts have held that the public has the right of navigation therein. That a riparian owner must recognize the right of the public and provide for such navigation as the needs of the stream require; if for the transportation of logs or the products of the forests, sluiceways and other appliances must be furnished in connection with the dam; if vessel navigation is possible, locks must be provided. In cases where the title to the bed of the stream is in the State, such as the Hudson River, the legislature has authorized the construction or maintenance of dams in the same in many cases, and at the same time making provision for the use of the stream for navigation by the construction of locks or other appliances suitable therefor. This has been the uniform practice in the State of New York, recognized by the courts and adopted by the legislature. All the water-power rights and privileges in the State of New York are based upon the rights of the riparian owner in her inland streams, regulated by judicial decision, and legislative acts with respect to navigation.

Where the title to the bed of the stream is in the State, appropriate legislation has been enacted conferring upon the riparian owner the right to maintain the dam on the soil of the State, and the public right has been safeguarded in most cases by the so-called canalizing the stream.

This is precisely what was done in the present case. Ogden as riparian owner in the year 1803 constructed the dam in question. In 1808 the legislature of the State of New York canalized the stream and authorized Ogden to charge tolls for lockage service at a fixed rate, limited the benefits derived from such tolls at the rate prescribed to a period of seventy-five years. In other words, the legislature recognized the right of Ogden to construct and maintain the dam and granted him a franchise to charge tolls for lockage service in the interest of navigation. The public right was thereby conserved. (Ex. No. A–10.)

OGDEN ACQUIRED WATER-POWER RIGHTS AND PRIVILEGE BY VIRTUE OF ACT OF 1808—TITLE TO BED WAS CONFIRMED IN OGDEN BY ACT OF 1826.

The proof is that Ogden complied with the provisions of the act of 1808, constructed the locks and gave lockage service to all vessel navigation up and down from that time until about the year 1850, when the Canadian Government built a larger canal on the Canada shore. In 1826 the question of the title to the bed of the stream became mooted. The courts were drifting away from the common-law rule of England and exhibited a tendency to hold that some of our inland streams were navigable and therefore title to the bed became uncertain. Jurists in some jurisdiction were claiming that nontidal fresh-water inland rivers were navigable streams in law; that when streams were navigable in fact they became navigable in law. This would tend to unsettle the title and to guard against a miscarriage of justice, the legislature of the State of New York confirmed in Ogden the ownership to the bed of the stream which has been improved by reason of the construction and operation of the dam for a period of about twenty years. The act was not in the nature of a grant, but was confirmatory of his title. It states:

> David A. Ogden * * * shall, and he is hereby, declared to be vested with all right of the people of this State to the land situate below the dam, in which by reason thereof (the dam) has been rendered susceptible of improvement, and extending down the branch of the river from the said dam to the navigable waters thereof (St. Lawrence). (Ex. A–11.)

This act was clearly confirmatory, judging from the report of the judiciary committee having the bill under consideration. In effect, this report stated, that it had been proven that the river at that place was nonnavigable in fact; that Ogden as riparian owner claimed title to the bed thereof; that the legislature confirmed in him title to the lands recognizing the justice of his claim.

Conceding for the sake of argument that the State actually owned the bed of the Little River, in that even it held the same, subject to the right of passage thereon by the public and in addition had the regulation and control thereof in the interest of navigation until such time as the Federal Government assumed control by legislation. Until Congress acted the State held such regulation and control as trustee for the people. It was a sort of dual ownership, to wit, a technical fee in the soil, subject to the right of navigation in the public and the rights in the riparian owner to a reasonable use of the water; it also held, as trustee, the right to control and regulate navigation, subordinate only to the rights of the Federal Government in the interest of commerce.

The State has the undoubted power to grant the fee in the soil to a riparian owner and likewise to confer upon such owner the right to the use of the water by way of a franchise. In other words the State had the right to grant the title to bed as well as the beneficial use of the water to such riparian owner.

The court of appeals in a very late case has fully discussed this question, and Judge Chase has quoted many authorities upon this point. The question before the court related to the rights of a riparian owner in tidal waters, where it conceded the fee was in the State. (People *v.* Steeplechase Park Co., 218 N. Y. 459.)

In the course of the opinion the judge quoted from the Long Sault Dev. Co. case 212, N. Y. 1–8, as follows:

> The power of the legislature to grant land under navigable waters to private persons or corporations for beneficial enjoyment has been exercised too long and has been affirmed by this court too often to be open to serious question at this late day. The contemplated use, however, must be reasonable and one which can fairly be said to be for the public benefit or not injurious to the public. For every purpose which may be useful, convenient or necessary to the public, the State has the unquestionable right to make grants in fee, * * * or to promote commerce according to their terms.

With respect to the right of the State to grant away first the title to the bed and second the privilege to use the water which it holds in trust, the court says:

> The title to lands under tide waters in this country which before the revolution was vested in the King, became upon the separation of the Colonies, vested in the States within which they were situated. The people of the State in their right of sovereignty succeeded to the royal title and through the legislature may exercise the same powers, which previous to the revolution, could have been exercised by the King alone, or by him in conjunction with Parliament * * * The State in place of the crown, holds the title as trustee of a public trust, but the legislature may, as the representative of the people, grant the soil, or confer an exclusive privilege in tide waters, or authorize a use (even) inconsistent with the public right, subject to the paramount control of Congress through laws passed, in pursuance of the power to regulate commerce, given by the Federal Constitution (p. 476).

In other words, the legislature of the State of New York had a perfect right under the authority of these decisions first to grant to Ogden as riparian owner, the fee in the bed of the stream, in case it had any, and it did so without restriction or limitation by the act of 1826.

Secondly, it likewise possessed authority to confer upon Ogden the right to use the waters even though "inconsistent" to a degree, with the public right of navigation. The legislature had the right, as representative of the public, to confer upon Ogden the beneficial use of these waters in such manner as it deemed most advantageous to the public at large. The State in its sovereign capacity possessed the power to authorize Ogden to maintain the dam, and did so on condition that it canalize the stream, and provide lockage service in the interest of navigation. It is the settled law of this country, that the State may authorize the construction and maintenance of a dam in waters where it owns the bed of the stream. It was first decided about the year 1829 by the Supreme Court of the United States, in the case of Thompson Willson *v.* Black Bird Creek Marsh Co. (2 Peters, 245).

The question involved in that case was the right of Federal Government to interfere with a structure authorized by the State. It

was held that each State has plenary power to legislate with respect to the use of public waters for navigation until Congress legislated with respect thereto. It decided that the State, having authorized the construction of the dam in question, the Federal Government had no right to interfere unless the Federal Government had legislated upon the subject prior to the passage of the State law.

The Long Sault Development Co. case (212 N. Y. 1) refers to this doctrine as follows:

> The State, through the Federal Constitution, delegated to the Federal Congress the power to regulate commerce among the several States and with foreign nations and thereby subjected itself to a right, superior to its own, to control the waters and soil of its navigable waters so far as may be necessary for the regulation of interstate or foreign commerce. Until Congress acts on the subject, the power of the State is plenary (p. 19).

The point of the reference to these cases is that the Legislature of the State of New York in 1808 authorized the maintenance of the dam already constructed at the place in question; it empowered the owner of the dam to construct locks in connection therewith, and charge tolls therefor. The right to exact tolls at the rate fixed was limited to seventy-five years; the very language prepossesses a continuance of the structures and hydraulic works. By the same act it conferred upon Ogden the right to the beneficial use of the water.

In 1826 it confirmed in Ogden the fee to the bed of the stream, using language which cast a doubt upon its title to the lands in question.

The State had "plenary power" to enact such laws in the absence of Federal legislation on this point and is now in no position to challenge the right of the applicant to maintain its hydraulic structures in this river.

APPLICANT HAS ACQUIRED WATER POWER RIGHT AND PRIVILEGES AND TITLE TO BED AND USE THEREOF BY PRESCRIPTION IF OTHER TITLES FAIL.

Again, assuming but not admitting that the State had title to the land originally, the fact is that about the year 1803 Ogden built the dam under claim of title and the structure has been maintained for a period of one hundred years and upwards. It was erected prior to the act of 1808, not pursuant thereto. Its occupation and ownership has been open and notorious; mills have been built, operated, destroyed, or abandoned during this entire period. The grant of the adjacent lands was made to Ogden's predecessors in title prior to 1800. Record title is complete from that date. The water-power rights and privileges have been openly used since the dam was first constructed, and therefore applicant has acquired title by prescription, if per chance he did not own the property when the dam was constructed.

The question of prescriptive right was discussed and decided in the Re Commissioners State Reservation (37 Hun., 537–548) [New York State decision]:

> It follows that the riparian owners had no lawful right as against the State to construct and maintain the wing dam in question, and therefore no right to claim compensation for the value of its use for supplying water power to operate machinery on the premises, unless it was constructed and has been maintained under circumstances including those of acquiescense on the part of the State such

as to equitably entitle the owners to relief or unless they have the support of a prescriptive right to maintain it. In respect to the latter it will be assumed that the State could grant its right of property in this river and its bed, and that a right might to that extent be acquired through the statute of limitation by such enjoyment for a period of forty years, as is required to bar the right of action to terminate such encroachment, occupation, and use. (Code Pro., Sec. 75; Code Civil Pro., Sec. 362; People *v.* Van Rensselaer, 8 Barb., 189; People *v.* Arnold, 4 N. Y. 508.)

To constitute such bar and right it is necessary that the use be enjoyed under a claim of right or adversely and that it be nototious, continuous, and uninterrupted for the requisite time. (2 Wash. Real Prop. (th ed.) 322, 326; Colvin *v.* Burnet, 17 Wend., 564; People *v.* Arnold, 4 N. Y., 508; Miller *v.* Garlock, 8 Barb., 153.)

The same question was decided in the Fulton Light, Heat and Power Co. case cited above. The court said:

Possibly the question of title and right by adverse possession and prescription does not become important, in view of the conclusions already stated. As the point is made that the State reacquired the bed of the Oswego River "as canal lands at the time of the construction of the Oswego Canal in 1826" and, at that time, acquired all the water power, it may be useful to discuss this question. I think that on the facts, the record title of the claimants to the land in question, by long-continued possession and occupation, and their right by prescription, to use the waters not actually needed for the old Oswego Canal, are reinforced and made good. * * * (p. 420).

In another case it was held with respect to the right of riparian owners as against the State, to maintain a wing dam in the Niagara River, that a claim for compensation for the value of its use might be lawful, if it had "the support of a prescriptive right to maintain it." (Matter of Commissioners of State Reservation, etc., 37 Hun., 357; and see Timpson *v.* Mayor, etc., of N. Y., 5 App. Div., at p. 429.) In Burbank *v.* Fay (supra) the elements necessary to constitute a prescriptive right were considered and it is said that "the possession should have certain qualities and characteristics, such as being adverse, continuous, uninterrupted, and by the acquiescence of the owner of the estate over which the easement is claimed. An adverse possession under this rule means a claim asserted as a matter of right, and can not grow out of a mere permissive enjoyment (p. 65).

In that case the claim was, in effect, against the State whose commissioners' acts, in depriving the plaintiff of certain privileges, were the subjects of complaint and the rule was deemed applicable to the case; inasmuch as the possession did not comply with it. There was no proof how the privileges connected with the use of the Erie Canal basin commenced, and therefore, it was necessary to presume as the only lawful manner was by permission of the State authorities, that it commenced in that manner (p. 422).

The Supreme Court of the United States in Shively *v.* Bowlby (152 U. S., 1–12) recognizes title by prescription or usage. This was a case where the title to the bed of the stream was in the State. It qoutes the following language:

Yet they (lands) may belong to the subject in point of propriety, not only by charter or grant, whereof there can be but little doubt, but also by prescription or usage (p. 12).

Our contention is that if all other sources of title fail, the New York & Ontario Power Co. still owns the property on which its dam is located, together with the water rights and privileges by prescriptive right fully recognized by our courts.

STATE OF NEW YORK HAS SURRENDERED ITS RIGHT TO OBJECT TO APPLICANT'S PROPOSED IMPROVEMENT SO FAR AS POWER RIGHTS AND NAVIGATION IS CONCERNED.

The State of New York is no longer in position to question the water-power rights and privileges of the applicant so far as the same

relates to navigation. That right rests with the Federal Government alone.

Upon the formation of our Government the States ceded to the Federal Government the constitutional right to regulate our navigable streams in the interest of commerce. Congress is clothed with full power to regulate and control our navigable waters. When Congress takes legislative action in relation thereto, the State is ousted of its authority to control the same; until the Federal Government acts the authority of the State is plenary; after Congress acts, the State has no further authority over our waters so far as navigation is concerned.

This question was fully discussed by the Supreme Court of the United States, in the case of United States *v.* Bellingham Bay Boom Co. (176 U. S. 211). This case was decided by Justice Peckham in the year 1899. The point at issue was the right to maintain a boom in a stream in the State of Washington where the title to the bed was in the State. It appears that the defendant maintained a boom which interfered with navigation; the existence of the boom was authorized by the legislature of the State; the authority of the Federal Government to abate what was considered a menace to navigation was the point at issue. The court held, that until the Federal Government legislated upon the question, each State had full authority to enact laws controlling streams with respect to navigation. It further held that Congress had enacted laws covering the subject (obstructions in navigable streams) in the year 1890, and therefore the Federal Government had full control and jurisdiction over the subject matter—that the States no longer possess the right to act with respect thereto; provided, of course, the subject was covered by the Federal acts.

U. S. *v.* Bellingham Bay Boom Co. (176 U. S. 211). It further held, that the power of the Federal courts was limited to the question whether the structure was authorized by the State and, if so, was the structure built and maintained in accordance with the State law.

The United States Government in late years has passed several acts regulating and controlling navigable streams in the interest of commerce. Its legislation has fully covered the question involved in this application, to wit, the reconstruction, repair, and maintenance of the dam, proposed dam, and other works.

The Federal Government having acted by the passage of such acts it is beyond the power of the State government to interfere. The Federal Government might in the interest of navigation legislate with respect thereto, but the State government has no right to raise abstract questions in this proceeding.

In view of the legislative acts passed by the State legislature above referred to and the riparian rights possessed by applicant's predecessors in title, at the very best the State's interest is limited to the question of the ownership of the river bed and the right of the applicant to improve the fore bay by making excavations and the construction of the embankment and weir in the north channel as proposed. All other rights have been conferred upon Ogden and acquired by the applicant subject to the rights of the Federal Government with respect to navigation.

In view of the foregoing the applicant herein prays for a rule, order, or decision granting to the New York and Ontario Power Company:

1. The right to reconstruct or repair its dam and hydraulic works at a point in the Little River at or between A and B on Plate I.

2. The right to improve its fore bay by making excavations in the Little River to such extent as may be necessary to enable applicants to utilize such waters as this commission permits it to divert to the highest degree of efficiency.

3. The right to divert through the Little River the natural flow of the stream as shown by Plate II.

4. The right to construct an embankment from Ogden to Canada Island as shown in Plate I. The construction of the same to be under the direction and control of the engineers of this commission.

5. The right to construct a submerged weir in the north channel of the St. Lawrence River below navigable depths as shown on Plate I. The construction of the same to be under the direction and control of the engineers of the commission.

6. The right to divert through the Little River such additional or supplementary waters as may be necessary to maintain a uniform flow of thirty thousand (30,000) cubic feet per second when such diversion of supplementary waters will not detrimentally affect navigation in the north channel. Such supplementary waters are shown by Exhibit 22. The diversion of such supplementary waters to be under the direction and control of this commission.

All of which is respectfully submitted.

Dated Jan. 1, 1919.

THOMAS SPRATT,
GEO. E. VAN KENNEN,
Attorneys for Applicant, Ogdensburg, N. Y.

EXHIBIT A–1.

ARTICLES OF INCORPORATION OF NEW YORK & ONTARIO POWER COMPANY.

To the commission of gas & electricity of the State of New York:

The petition of the New York & Ontario Power Company of the village of Waddington, St. Lawrence County, State of New York, respectfully shows:

That the object of its incorporation is the manufacture, use, sale and transmission of electricity, as more fully appears by its articles of incorporation or certificate of its charter, a certified copy of which is hereto attached and made a part hereof, marked "Exhibit A."

That your petitioner is offered and has received an option to purchase the water power property, water rights and land situate at the said village of Waddington, N. Y., and briefly described as the dam and water power across and adjacent to a branch of the St. Lawrence River from the Isle au Rapid Plat to the south side of the River St. Lawrence in said village.

That the purpose of your petitioner is to purchase said property, complete and erect proper dams, power houses at said place and install therein the necessary appliances and equipment to generate and

manufacture electricity, and to furnish electrical power to light the streets, public places, private residences of the said village of Waddington, and to furnish such power to the inhabitants of said village as may desire to purchase the same for manufacturing purposes, and also to transmit electricity for the purpose of producing light, heat and power for use in the city of Ogdensburg.

That your petitioner further proposes and intends to transmit and sell power to what is known as the Canada Tin Plate & Sheet Steel Co., Limited, of the village of Morrisburg, Canada, and has entered into an agreement with said company by which it has the right to furnish said company with at least five thousand h. p., for which said Canada Tin Plate & Sheet Steel Co., Ltd., agrees to pay fifteen dollars per h. p. per year. That said Canada Tin Plate & Sheet Steel Company, Ltd., is situate in the village of Morrisburg directly opposite the place where said water power is located and within two miles distant therefrom. That said Canada Tin Plate & Sheet Steel Co., Ltd., of the village of Morrisburg, is a large corporation organized for the purpose of manufacturing tin plate and is being equipped with machinery with which they expect to turn out at least one hundred tons of tin plate per day.

Your petitioner further shows upon information and belief, that there is no other person or company furnishing electricity to said village of Waddington, and it is necessary for said municipality for its safety, comfort and progress that they should have electricity for the purpose of light and power. That the city of Ogdensburg is situate about twenty miles west of said water power and is a city of about fifteen thousand inhabitants and where a large amount of power is required in the various occupations carried on by its inhabitants, but where there is but little water power, and it has but very little electrical power for manufacturing purposes; that there is only one corporation or person that furnishes electrical power for light and power for the convenience of said city and its inhabitants and that is the Ogdensburg Power & Light Company a domestic corporation, having a capital stock of fifty thousand dollars and has poles, wires and appurtenances to furnish light for the streets in said city, and to some extent incandescent lighting to private residences and inhabitants thereof; that it is furnishing but one or two people with electrical power for power purposes. That said city of Ogdensburg and the inhabitants thereof would purchase and use a very large amount of electrical power over and above what could be supplied by said Ogdensburg Power and Light Company provided the same could be purchased at reasonable rates.

Your petitioner further shows that it has received the required consent of the proper municipal authorities of the said village of Waddington, town of Waddington, town of Lisbon, and the city of Ogdensburg, in and through which municipalities it proposes to erect its poles and transmit electricity and dispose of its power, as appears by the verified statements of the president and secretary and your petitioner, hereto attached and made a part hereof.

That your petitioner, through its officers and agents, is well acquainted with the people of the surrounding villages, towns, and cities and with the demand for electrical power, and that such demand is great and that there will be no difficulty whatever in selling all of the power that can be manufactured at said water power at

reasonable rates and that a large amount of money can be obtained annually therefrom.

That your petitioner has sought and obtained the judgment of skiller engineers who are well acquainted with the development and value of water power, and have caused them to examine said water power property with a view of making an estimate of the number of h. p. which can be developed therefrom, and the cost of constructing necessary dams, power houses, and the necessary machinery, and the value of the property when complete, and the income derived therefrom. That your petitioner is informed by said engineers that said water power is a very valuable one, and with proper care and skill at least 30,000 h. p. can be developed. That your petitioner thoroughly believes that said number of h. p. can be sold for at least $15 per h. p. per year.

Wherefore, your petitioner prays that a certificate of authority to exercise its powers and transact business according to the provisions of section eleven, chapter 737, of the laws of 1895, be granted to the said New York & Ontario Power Company.

Dated, August 10, 1906.

NEW YORK AND ONTARIO POWER COMPANY,
By DAVID J. CRICHTON, Jr., *President.*

STATE OF NEW YORK,
St. Lawrence County, ss:

David J. Crichton, jr., being duly sworn deposes and says, that he is the president of the corporation above named; that he executed and signed said petition by authority of said corporation, viz, by resolution of its board of directors; that he has read the foregoing petition and knows the contents thereof; that the same is true of his own knowledge, except as to the matters therein stated to be alleged upon information and belief, and as to those matters he believes it to be true.

DAVID J. CRICHTON, Jr.

Sworn to before me this 10th day of August, 1906.

DAVID M. SPRATT,
Notary Public.

STATE OF NEW YORK,
County of St. Lawrence, ss:

David J. Crichton, jr., and John W. Liston, each being duly sworn doth depose and say, that the said Crichton is president and the said Liston is secretary of the New York & Ontario Power Company, a domestic corporation organized under and pursuant to the laws of the State of New York, and having its office and principal place of business at the village of Waddington, St. Lawrence County, N. Y., and organized for the purpose of manufacture, sale, and transmission of electricity; that said corporation has received the required consent of the municipal authorities of the village of Waddington to erect poles and other conduits in and on the streets of said village for the purpose of transmitting electricity to produce light, power, and heat and to sell the same in said village and also the required consent of the municipal authorities of the towns of Waddington and Lisbon, and the city of Ogdensburg to erect and construct neces-

sary poles and other fixtures on and over the streets of said towns and city for the purpose of conducting and distributing electricity for heat, light, and power.

DAVID J. CRICHTON, Jr.
JOHN W. LISTON, *Sec.*

Sworn to before me this 10th day of August, 1906.

DANIEL M. SPRATT, *Notary Public.*

EXHIBIT A.

We, the undersigned, all being persons of full age and all being citizens of the United States, and residents of the State of New York, desiring to become a corporation for the purposes herein specified, pursuant to the provisions of article (6) six of the transportation corporations law, of the State of New York, do hereby certify as follows, to wit:

First. The name of the corporation is to be "New York & Ontario Power Company."

Second. Its objects are to be manufacturing, using, and transmitting electricity for producing light, heat, or power, and in lighting streets, avenues, public parks and places, and public and private buildings of cities, villages, and towns within this State. The names of the towns, villages, cities, and counties in which the operations of the corporation are to be carried on are as follows:

The villages of Malone, Tupper Lake, and Saranac, in the county of Franklin, State of New York; the city of Plattsburgh, in the county of Clinton, State of New York; the villages of Waddington, Madrid, Canton, Gouverneur, and Potsdam, in the county of St. Lawrence, State of New York; the city of Ogdensburg, in the county of St. Lawrence, State of New York; the city of Watertown, in the county of Jefferson, State of New York; the villages of Adams and Carthage, in the county of Jefferson, State of New York; the village of Booneville, in the county of Oneida, State of New York; the cities of Rome and Utica, in the county of Oneida, State of New York; the city of Syracuse, in the county of Onondaga, State of New York; the city of Oswego, in the county of Oswego, State of New York.

Third. The amount of its capital stock is to be two million ($2,000,000.00) dollars.

Fourth. The term of its existence is to be fifty (50) years.

Fifth. The number of shares of which the capital stock shall consist is to be twenty thousand shares, of the par value of one hundred ($100) dollars each.

Sixth. The number of directors is to be three.

Seventh. The names and place of residence of the directors who are to serve for the first year are as follows, viz: David J. Crichton, jr., No. 17 Elizabeth Street, Ogdensburg, N. Y.; John W. Liston, No. 29 Fayette Street, Ogdensburg, N. Y.; William F. Burt, No. 32 King Street, Ogdensburg, N. Y.

Eighth. The principal business office of the corporation is to be located in the village of Waddington, St. Lawrence County, State of New York.

In witness whereof we have made, signed, and acknowledged this certificate in duplicate this 11th day of April, 1906.

DAVID J. CRICHTON, Jr.
JOHN W. LISTON,
WILLIAM F. BURT.

STATE OF NEW YORK,
County of St. Lawrence, ss:

On this 11th day of April, 1906, before me personally came David J. Crichton, John W. Liston, and William F. Burt, to me severally known to be the persons described in and who made and signed the foregoing certificate and severally and duly acknowledged to me that they had made, signed, and executed the same for the uses and purposes therein set forth.

DANIEL M. SPRATT, *Notary Public.*

STATE OF NEW YORK,
Office of Secretary of State, ss:

I have compared the preceding with the original certificate of incorporation of "New York & Ontario Power Company," filed and recorded in this office on the 18th day of April, 1906, and do hereby certify the same to be a correct transcript therefrom and the whole of said original.

Witness my hand and the seal of office of the secretary of state at the city of Albany, this eighteenth day of April, one thousand nine hundred and six.

[SEAL.] FRANK D. COLE,
Deputy Secretary of State.

Tax for privilege of organization of this corporation, $1,000, under chapter 441, laws of 1901, paid to State treasurer before filing.

Recorded April 20, 1906, 9 a. m. J. Fred Hammond, Clerk. Recorded in Liber 2, Certificates of Incorporations, page 556.

STATE OF NEW YORK,
St. Lawrence County Clerk's Office:

I hereby certify that I have compared the foregoing copy with the original record in this office, and that it is a true and correct transcript therefrom, and of the whole of said original.

In witness whereof I have hereunto set my hand and seal of office at Canton this 20th day of Apr., 1906.

[SEAL.] J. FRED HAMMOND, *Clerk.*

EXHIBIT A–2.

DECREE OF NEW YORK STATE GAS AND ELECTRICITY COMMISSION.

At a meeting of the Commission of Gas and Electricity of the State of New York, held at the capitol, in the city of Albany, on the 2nd day of May, 1907.

Present: Frededic E. Gunnison, John C. Davies, Lucian L. Shedden, commissioners.

In the matter of the application of New York and Ontario Power Company for a certificate of authority to transact business and for consent to issue bonds to the amount of $2,000,000 and capital stock to the amount of $2,000,000.

On reading and filing the petitions of New York and Ontario Power Company for a certificate of authority to transact business, proposing to manufacture, use, transmit, and sell electricity for light, heat, and power in the village of Waddington, the city of Ogdensburg, and other places named in the certificate of incorporation, and for consent to issue two million ($2,000,000) dollars par value of capital stock and two million ($2,000,000) dollars par value of bonds in the denomination of one thousand ($1,000) dollars each, which said petitions were duly filed in the office of the commission on the 17th day of August, 1906; a certified copy of the certificate of incorporation of the petitioner filed and recorded in the office of the secretary of state the 20th day of April, 1906; a certified copy of the resolution of the board of directors authorizing such issue of bonds; the affidavit of John W. Liston, verified Aug. 10th, 1906; the joint affidavit of David J. Crichton, jr., president, and John W. Liston, secretary of the petitioner, showing that it has received the consent of the proper municipal authorities, the consents of the village of Waddington, the city of Ogdensburg, and the towns of Waddington and Lisbon; the affidavits of Julian Thornley, Henry D. Symmes, and Banker R. Payne as to the estimated cost of the construction and equipment proposed by the petitioner; the affidavit of David J. Crichton, jr., verified Aug. 10, 1906, to the effect that no stock and bonds have been issued by the petitioner, and as to the value of the property and franchises owned or to be acquired and to be operated by the petitioner; and, after a public hearing held at the capitol, in the city of Albany, on the 6th day of September, 1906, pursuant to notice thereof duly published in the Ogdensburg Journal and the Ogdensburg News, two newspapers published in the county of St. Lawrence, Hon. Thomas Spratt, Hon. George R. Malby of counsel, appearing for the petitioner, and no one appearing in opposition, and on reading and filling the supplemental affidavit of Julian Thornley, verified September 15, 1906, and the petitioner having made and filed a supplemental petition asking consent to issue of stock to the amount of two hundred fifty thousand ($250,000) dollars and bonds to the amount of two hundred fifty thousand ($250,000) dollars instead of the two million ($2,000,000) dollars stock and two million ($2,000,000) dollars bonds originally applied for, the proceeds of said stock and bonds to be used as therein stated, and a further hearing having been had on said supplemental petition on the 28th day of March, 1907, at the capitol, in the city of Albany, at which the matter was submitted upon the evidence heretofore taken herein, and the commission having inspected the property and water power proposed to be purchased:

Now, after due deliberation, it is

Ordered, That said application for a certificate of authority to transact business be and the same is hereby granted, and the commission of gas and electricity hereby certifies in accordance with section 11, chapter 737 of the laws of 1905, that New York and Ontario Power Company is authorized to exercise its powers and to transact business within the city of Ogdensburg, the village of Waddington and the towns of Waddington and Lisbon, and the said commission hereby further certifies in accordance with section

12, chapter 737 of the laws of 1905, that capital stock to the amount of one hundred fifty thousand ($150,000) dollars, and bonds to the amount of one hundred fifty thousand ($150,000) dollars are reasonably required for the purposes for which such issues are authorized, and this commission hereby approves of and consents to the issue by the New York and Ontario Power Company, in conformity with all the requirements of law relating thereto, of one thousand five hundred (1,500) shares of capital stock of the par value of one hundred ($100) dollars each, and of three hundred (300) bonds of the denomination of five hundred dollars each, payable in thirty (30) years from the date of issue, bearing interest at the rate of 5% per annum, to be secured by a first mortgage on the water power rights, plant and franchises of the petitioner acquired and to be acquired in the sum or amount of two million ($2,000,000) dollars heretofore authorized on the condition, nevertheless, that only one hundred fifty thousand ($150,000) dollars of bonds thereunder be issued under this order, and that further application be made to this commission before issuing any portion of the balance of said bonds secured by said mortgage: And it is further

Ordered, That said issue of stocks and bonds, or the proceeds thereof, be applied to the following purposes and to no other, to wit: To take over the said water power and all rights thereto at Waddington, also present dams, power houses, and buildings in connection with said water power property, and all property and real estate in connection therewith necessary for the purpose of the proposed improvements and development of said water power and to the purchase of the Waddington Electric Light Plant mentioned in said original petition, and to pay for present extensions and repairs to said Waddington Electric Light Plant: And it is further

Ordered, That said application for consent to issue stock and bonds other than as above consented to be and the same is hereby denied.

[SEAL.]

FREDERIC E. GUNNISON,
JOHN C. DAVIES,
LUCIAN L. SHEDDEN,
Commission of Gas and Electricity of the State of New York.

EXHIBIT A–3.

DEED OF J. WESLEY ALLISON TO NEW YORK & ONTARIO POWER COMPANY—GENERAL DEED.

This indenture, made this 10th day of July in the year one thousand nine hundred and seven, between J. Wesley Allison and Minnie E. Allison, his wife, of the village of Morrisburg, Province of Ontario, Canada, party of the first part, and the New York and Ontario Power Company, of the village of Waddington, St. Lawrence County, N. Y., party of the second part,

Witnesseth, That the said parties of the first part, in consideration of the sum of one dollar lawful money of the United States of

America to them in hand paid by the said party of the second part and for other good and valuable considerations, them thereunto moving, have sold and by these presents do grant and convey unto the said party of the second part, its successors and assigns,

FIRST.

"All the lands, premises, and privileges conveyed by a certain deed dated 24th August, 1895, executed by Elizabeth M. Crapser to Andrew Allison Logan and therein described as follows:

"All that tract or parcel of land, situate in the town of Waddington, county of St. Lawrence and State of New York and briefly described as follows:

"All that part of the dam in and across the southerly branch of the Saint Lawrence River at Waddington in said county lying westerly of the water lot of John T. Rutherford and running thence westerly to the bank or shore of the island including the land and land under water lying between said dam and low water mark on the south shore of the island. Also all that other piece or parcel of land, situate in the town of Waddington, County of St. Lawrence and State of New York and briefly described as follows:

"Beginning at a point on the wing dam sixty-seven feet six inches southwesterly from the northeasterly corner of said dam and running thence along said wing dam and the same course continued north thirty-seven degrees east one hundred and fourteen feet six inches to the easterly line of the old dam, thence north thirty-one and a half degrees west being a continuation of the easterly line of the old dam to the channel of that part of the river St. Lawrence flowing southerly of the island called 'Isle au Rapid Plat;' thence up the channel of said river by the windings thereof to a point which would be intersected by a line run at right angles with said wing dam from the place of beginning; thence southerly along said last mentioned line one hundred feet to the place of beginning together with all the rights and privileges belonging to or in any way appertaining to said premises hereby granted in the same manner and to the same extent as such privileges are now held and possessed by the said party of the first part. Also all that other parcel of land situated in the village of Waddington aforesaid and bounded and described as follows:

"Beginning at a point forty feet east from the corner of the wing dam and running thence thirty-seven degrees east one hundred and twenty-five feet to easterly line of the bridge below the dam; thence northerly and on a line with the easterly line of said bridge to the channel of that part of the River St. Lawrence flowing south of said island; thence up said channel following the windings thereof to a point being the northeasterly corner of a lot deeded to said J. T. Rutherford by Richard Harison and Harriet his wife; thence southerly along the easterly line of said lot to the place of beginning, with the right of way to said premises from the bridge below the dam granted by Isaac Ogden and Sarah, his wife, to Richard Harison and James G. Skinner subject to a right of way granted by Richard Harrison and James G. Skinner to Isaac Ogden, this conveyance is subject to the provisions of an agreement made between Joshua Waddington and Thomas L. Ogden of the first part

and George Redington of the second part dated the 20th day of March, 1831, and to all the conditions therein contained.

"Excepting and reserving from the above described premises all buildings and machinery now on said premises with the right to remove them, said buildings and machinery shall be removed within 90 days after a written notice is served on the party of the first part by the party of the second part notifying her to remove said buildings and she shall have 90 days after service of said notice to remove said buildings and machinery and the party of the first part may use said buildings and machinery together with the necessary water to run the same free of charge until the removal of the same as herein provided. The right is hereby granted to the party of the second part or his assigns to attach to and run from the water wheel in the saw mill on the said premises any stone crushing plant that he may desire to run until such time as the same is removed as herein provided for.

The party of the first part hereby grants to the party of the second part or his assigns the right to remove all or any part of the stone bridge above the dam but upon the express condition that the party of the second part or his assigns shall erect in its place, in such manner as not to impede travel across the same, and forever maintain at their own cost and expense for the use of the people of Ogdens Island a steel structure of not less than fourteen feet in width and of sufficient strength to carry with safety a weight of 10 tons, the right to remove said bridge and to erect and maintain in its place a steel structure is to be construed as a covenant running with the above described premises and pieces and parcels of land and water and is a charge upon the above described premises and betterments that may be put thereupon is hereby created for the purpose of guaranteeing to the party of the first part, her successors, and assigns, the faithful fulfillment of this covenant, which covenant is accepted and assumed by the party of the second part and his assigns."

Being the same premises which were conveyed by Elizabeth M. Crapser to Andrew Allison Logan by warranty deed dated 24th August, 1905, and recorded in St. Lawrence County clerk's office 21st September, 1905, at two p. m. in Liber No. 166C of Deeds, at page 1670, &c.

SECOND.

All that certain lot or parcel of land situate between the village of Waddington in the county of St. Lawrence and State of New York and a certain island in the River St. Lawrence called "Isle au Rapid Plat," the said lot being situate below the stone dam having for its center below and adjoining the dam the middle of flume No. 4 computing from the old locks and distant therefrom about 406 feet 7 inches, measuring from the lower or easterly side of said dam and adjoining the southeasterly foundation of said locks and begins 48 feet 3 inches northerly from the center of said flume and runs southerly in front or below the said dam adjoining thereto 96 feet 6 inches; thence at right angles to the said dam 100 feet; thence parallel with the said dam 96 feet 6 inches; thence at right angles to the said dam and parallel with the second line 100 feet to the place of beginning, but if the road laid out below the said dam across the said river shall

extend easterly below the said dam more than the said 100 feet then the easterly line of said lot shall extend to the road or bridge. Together with the right to take and use so much water from the said dam through the said flume as shall be requisite and necessary for the manufacturing of paper or any other thing upon the said lot of land or for any hydraulic purpose, and also with the right of passing and repassing from the main shore to any part of the said lot by and along the said road or bridge. Subject to a certain agreement concerning the future reparation and maintenance of the said dam and bridge made between Joshua Waddington and Thomas L. Ogden of the first part and George Redington of the other part, dated the 20th day of March, 1831.

PARCEL TWO.

Also all that water lot or parcel of land covered with water situate in the bed of the River St. Lawrence in the town of Madrid (now town of Waddington) in the county of St. Lawrence and State of New York below and adjoining the stone dam erected between the village of Waddington and the island called "Isle au Rapid Plat" bounded northwardly by the line of the grist mill lot formerly owned by Messrs. Waddington and Ogden's heirs, being a line running parallel with and distant 14½ feet from the southerly wall of their stone grist mill; southerly by the line of the "paper mill lot" and extending between these lines from the said dam down the River St. Lawrence to the bridge containing in breadth along the dam 85 feet more or less, and in length from the dam to the bridge 100 feet more or less. Together with the right and privilege of drawing off the water of the river or pond above the said dam through the flumes contained therein opposite to the said lot and of using and employing the same for hydraulic purposes and also the right and privilege of passing and repassing the said bridge from the villege to the above described lot with horses and other teams and so forth, subject, however to a certain agreement concerning the future support and maintenance of the said dam and bridge made between Joshua Waddington and Thomas L. Ogden of the first part and George Redington of the other part, bearing the date March 20, 1831. Subject to all the conditions and provisions thereof so far as the same are or may be applicable to the owner of the above described premises.

PARCEL THREE.

Also all that certain parcel of land on which stand the walls of a stone building erected for a mill, situate in the town of Waddington, county of St. Lawrence and State of New York, being land lying above and under water in part, in the bed of the River St. Lawrence, adjoining and below the stone dam erected between the village of Waddington and "Isle au Rapid Plat," and including so much of the dam as pertains to and is necessary to said lot, and is bounded as follows:

Beginning at the top of said dam at a point southerly 14 feet 6 inches from the southerly line of said stone mill extending from said dam, and running thence northerly and parallel with said dam to a point 10 feet northerly of the northerly line of said mill extended above said dam; thence easterly at right angles and parallel with

said northerly line of said mill to a point 100 feet below the bridge leading from the main shore; thence at right angles southerly and parallel with said dam to a point where a line on such course extended would intersect a line extended from the place of beginning at right angles with said dam; thence from such point westerly on a line parallel with the southerly line of said stone mill and fourteen feet six inches southerly therefrom to the place of beginning. Together with the right and privilege of drawing and using for hydraulic and other purposes the water of said river, and of passing and repassing on and using the said bridge below the said dam, subject, however, to a certain agreement between Joshua Waddington and Thomas L. Ogden of the one part and George Redington of the other part, dated March 20th, 1831, and recorded in the office of the clerk of St. Lawrence County in book No. 13 of Deeds, page 359, and to all the stipulations and provisions contained therein in respect to the reparation and maintainance of the bridge and the portion of the said stone dam included in the above description.

PARCEL FOUR.

Also all that tract or parcel of land situate in the town of Waddington, county of St. Lawrence and State of New York, below and adjoining the dam erected across that part of the River St. Lawrence lying between Ogden's Island and the southerly shore of said river, bounded and described as follows:

Beginning at the northwesterly corner of the paper mill lot, formerly owned by Henry R. James and running thence northerly along said dam 10 feet to a point; thence easterly on a line parallel with the northerly line of said paper mill lot about 100 feet to the bridge below the dam; thence southerly along said bridge 10 feet to the northerly line of said paper mill lot; and thence westerly along said northerly line about 100 feet to the place of beginning. Subject to all covenants and conditions contained in a certain agreement bearing date March 20th, 1831, between Joshua Waddington and Thomas L. Ogden of the one part and George Redington of the other part, concerning the reparation and maintenance of the said dam and the bridge below the same.

PARCEL FIVE.

Also all that lot or parcel of land situate in the village of Waddington, in the county of St. Lawrence and State of New York, and on the dam leading from said village of Waddington to the island known as "Isle au Rapid Plat" and beginning at a point on said dam which is 26 feet north from the northwest corner of the stone mill formerly owned by Henry R. James and running thence easterly along the northerly line of said James lot 300 feet more or less to the navigable waters of the river; thence northerly 110 feet more or less to a point from which a straight line drawn west shall strike the dam at a distance of 3 feet from the grist mill lately owned by J. T. Rutherford, thence westerly along said line to the dam, striking the same at a point 3 feet distant from the southeast corner of the said Rutherford grist mill; and thence southerly along the said line of the dam 100 feet more or less to the place of beginning, with the right to

construct flumes therein and to draw water from the pond above the dam for hydraulic purposes.

Being the same premises which were conveyed by the First National Bank of Canton, N. Y., to Andrew Allison Logan by deed dated 15th February, 1902, and recorded in St. Lawrence County clerk's office 15th April, 1902, at ten a. m., in Liber No. 158C of Deeds, at page 1829, &c.

THIRD.

All the lands, premises, and privileges which were conveyed by the village of Waddington to Andrew Allison Logan by deed dated 31st May, 1906, and rendered in St. Lawrence County clerk's office 11th June, 1906, in Liber No. 168A of Deeds, at page 404, &c., and in said deed described as follows:

"All that tract or parcel of land situate in the village of Waddington, County of St. Lawrence, and State of New York, upon and below the dam across the St. Lawrence River at Waddington aforesaid known as the woolen factory lot bounded as follows: Northerly by the old paper-mill lot; easterly by the bridge below said dam; southerly by said mill lot; and westerly by said dam, together with water power and water rights and privileges to the same belonging and which appertain to the said property under the agreement made by and between the proprietors of the said dam and water power and also the hereditaments and appurtenances belonging or in any wise appertaining according to the deed of said premises dated May 1st, 1879, executed between Delos McCurdy, referee, and the late Alexander H. Lord now deceased, which deed was duly recorded in St. Lawrence County clerk's office on the 19th day of December, 1879, in Liber 111B of Deeds, at page 24, &c.

And also all the poles, wires, street lamps, water works, water power, and water right belonging to the said party of the first part, together with the appurtenances and all the estate and rights of the said party of the first part, in and to the said premises."

FOURTH.

All the lands, premises, and privileges which were conveyed to Andrew Allison Logan by two deeds, viz, one from Ellen M. Proctor, Carrie E. Rose, and Anna B. Chalmers, dated 24th December, 1903, and recorded in St. Lawrence County clerk's office 29th December, 1903, at four p. m., in Liber No. 163A of Deeds, at page 90, &c., and the other made by William W. Proctor and Jennie M., his wife, dated 4th January, 1904, and recorded in said clerk's office 15th January, 1904, at two p. m. in Liber 163 of Deeds, at page 221, etc., and in said deed described as follows:

All that certain water lot or piece of land covered with water situate in the bed of the River St. Lawrence, in the town of Madrid, below and adjoining to a certain dam erected between the said village of Waddington and the island called Isle au Rapid Plat. The lot of land hereby intended to be described, beginning on the said dam at a point distant 15 feet northwardly from the stone factory lately conveyed to Isaac Ogden; thence running northwardly along the line of the said dam 97 feet; thence easterly by a line at right angles to the said dam to the upper or westerly line of the bridge between the

said island and village; thence southwardly along the westerly line of said bridge to that point therein from which a line to be run westwardly at right angles to the said dam shall intersect the same at the place of beginning, and thence westwardly by that line to the place of beginning. Together with the rights and privileges of drawing off the waters of the pond or river above the said dam through the flume constructed therein opposite to the said lot, and of using and applying the same for hydraulic purpose and also the right and privilege to the said party of the second part, his heirs and assigns, being owners or occupants of the said lot and his or their servants or workmen, of passing and repassing the said bridge from the said bridge to the said above-described lot of land and with horses, oxen, and teams for the necessary purposes of any mill, factory, or other hydraulic works erected or to be erected on the said premises. Subject nevertheless to a certain agreement bearing date 20th March, 1831, made by and between the said Joshua Waddington and Thomas Ludlow Ogden of the one part, and the said George Redington of the other part, concerning the future reparation and maintenance of the said dam and bridge and to all the conditions and provisions thereof so far set forth as the same are or may be applicable to the owner or owners of the premises hereby granted and conveyed and expressly charged with the performance and fulfilling of all the duties and obligations thereby declared to be incumbent on such owner or owners.

FIFTH.

All that certain stone factory or fulling mill and water lot or piece of land covered with water situate in the bed of the River St. Lawrence, in the town of Madrid and county of St. Lawrence, below and adjoining the dam erected between the village of Waddington and the island called Isle au Rapid Plat. The lot of land hereby intended to be described beginning on the said dam at a point distant 12 feet northwardly from the old grist mill now occupied by Cyrus B. Martin; thence running northwardly along the said dam 152 feet more or less to a point distant 15 feet northwardly from the northerly wall of the said factory being the south line of the water lot lately sold to George Redington; thence easterly along that line, being on a course at right angles to the said dam; to the westerly line of the bridge running from the said village to the said island; thence southwardly along the westerly line of the said bridge to that point therein from which a line to be drawn at right angles to the said dam shall intersect the same at the place of beginning, and thence westerly by that line to the place of beginning.

Together with the right and privilege of drawing off the waters of the pond or river above the said dam through the flume constructed therein opposite to the said factory, and through one other flume of similar dimensions to be constructed in the said dam opposite to some other part of the lot of land hereby conveyed, and of using and applying the same for hydraulic purposes, and also the right and privilege to the said party of the second part, his heirs and assigns, being owners and occupants of the said lot and his or their servants or workmen, of passing and repassing the said bridge from the said village to the said above-described lot of land with horses, oxen, and teams for the necessary purpose of any mill, fac-

tory or other hydraulic works erected or to be erected on the said premises. Saving and reserving to the said Joshua Waddington and Thomas Ludlow Ogden the right and privilege of constructing and maintaining in the said dam opposite to the lot of land hereby conveyed a flume, not exceeding three feet in width and of conveying through the said lot by a trunk or other conduit sufficient water for the use and supply of the distillery below the said bridge or for any other use or purpose.

Subject nevertheless to a certain agreement bearing date 20th March, 1831, made by and between the said Joshua Waddington and Thomas Ludlow Ogden of the one part, and George Redington of the other part, concerning the future reparation and maintenance of the said dam and bridge and to all the conditions and provisions thereof so far as the same are or may be applicable to the owner or owners of the premises hereby granted or conveyed, and expressly charged with the performance and fulfillment of all the duties and obligations thereby declared to be incumbent on such owner or owners.

Being the same premises which were conveyed by James K. Rutherford, as sole executor of the last will and testament of Henry B. Proctor, deceased, to Andrew Allison Logan by deed dated 8th December, 1903, and recorded in St. Lawrence County clerk's office 15th December, 1903, at 10.30 a. m. in Liber 162C of Deeds, at page 1720, et seq.

SIXTH.

All that certain first mill and water lot, or piece of land covered with water situate in the bed of the River St. Lawrence in the town of Madrid, County of St. Lawrence and State of New York, below and adjoining to the dam erected between the said village and the island called Isle au Rapid Plat, the said lot of land hereby intended to be described:

Beginning at the southwesterly corner of said mill, thence running northwardly along the same 53 feet to its northwesterly corner; thence eastwardly along the northerly line of said mill to the said dam; thence northwardly along the same 12 feet; thence eastwardly by a line at right angles to the said dam to the westerly line of the said bridge; thence southwardly along the westerly line of the said bridge to that point therein where it shall be intersected by a line to be drawn eastwardly in continuation of the southerly side of said mill; thence westwardly by that line to the place of beginning. Together with the right and privilege of drawing off the water of the pond or river above the said dam and of using and applying the same for the purposes of the said mill or for any other hydraulic purpose, provided that the water so to be drawn from the said pond shall not exceed in quantity what may be sufficient to propel six pair or sets of millstones for the grinding of wheat or corn. And also the right and privilege of passing and repassing through and along a road or passageway of at least 4 rods in width to be left open between North Street and the canal hereinafter mentioned. And also the right and privilege of erecting and maintaining a bridge or platform from the said road or passageway to the second floor of the said mill, but so always as to leave a free and open space beneath the same, for the passage of boats through a navigable canal about

to be constructed along the southerly foundation wall of the said mill from the said mill pond toward the mouth of Sucker Creek. Saving and reserving, nevertheless, to the said Joshua Waddington and Thomas Ludlow Ogden, their heirs and assigns the privilege and benefit of the said wall and the right and privilege if extending the said wall eastwardly through and along the southwardly line of the lot hereby conveyed, from the said mill down to the said first-mentioned bridge, and of maintaining and keeping up the same as an embankment for the purpose of sustaining and confining the waters of the said proposed canal. Subject, nevertheless, to a certain agreement bearing date March 20, 1831, made by and between the said Joshua Waddington and Thomas Ludlow Ogden of the one part and George Redington of the other part, concerning the future reparation and maintenance of the said dam and bridge; and to all the conditions and provisions thereof in respect to the reparation and maintenance of the said dam so far forth as the same are or may be applicable to the owner or owners of the premises hereby granted and conveyed, and expressly charged with the performance and fulfillment of all the duties and obligations thereby declared to be incumbent on the owner or owners.

Saving, however, excepting and expressly reserving from the said lot herein described, a portion of the same forty feet by fifty feet in extent which portion may be described as follows:

Beginning at the southeasterly corner of the lot heretofore described and running thence northerly along the westerly line of the bridge heretofore mentioned 50 feet; thence westerly on a line parallel to the southerly line of the lot heretofore described 40 feet; thence southerly on a line parallel with the westerly line of said bridge to the southerly line of the lot heretofore described 50 feet; thence easterly along the southerly line of the lot heretofore described to the place of beginning.

Also all that tract or parcel of land, situate in the village of Waddington, county of St. Lawrence and State of New York, on the north side of the canal in said village being the west part of the lot adjoining to the furnace lot and next adjoining on the east line of James Z. Skinner's tannery lot being twenty-five front on the canal and being of the same width on the north or river front. The said lot to run from the north bank of the canal toward the river aforesaid one hundred and fifty feet containing three thousand seven hundred and fifty square feet, it being understood and agreed that the above described lot does not extend to the river aforesaid, subject to all the conditions contained in a deed from Delide Brault to Harriet Corrons, dated the 20th day of July, 1882, and recorded in the St. Lawrence County clerk's office on the 20th day of September, 1882 in Book 116C of Deeds, at page 544.

Being the same premises which were conveyed by Bert S. Crapser to Andrew Allison Logan by deed dated 24th August, 1905, and recorded in St. Lawrence County clerk's office 31st August, 1905, at twelve m. in Liber 166C of Deeds, at page 1528, &c.

SEVENTH.

All that certain lot, piece or parcel of land situate on the northerly side of East North Street in the village of Waddington, county of St. Lawrence and State of New York, being the lot of land on

which the tannery of said Fenton is erected, the beginning corner of which lot is to be ascertained by running the following lines and distance that is to say; beginning at the northwesterly corner of Judge Richard's house in said village which is the intersection of the easterly side of Grass Street, and southerly side of East North Street and thence northeasterly along the southerly side of East North Street 7 chains and 2 links; thence northwesterly at right angles across East North Street 1 chain and 50 links to the northerly side of said street being the place of beginning, and running from thence at right angles to said East North Street toward the St. Lawrence River 5 chains and 97 links to a stone corner standing within the high water margin of the St. Lawrence River; thence at right angles to the last line down the river 1 chain and 50 links to a stone corner, which is also within the highwater margin of said river; thence at right angles to the last line parallel to the first line 5 chains and 97 links to a stone corner standing on the northerly side of East North Street; thence up the northerly side of East North Street; 1 chain and 50 links to the place of beginning.

Containing eighty-nine and one-half hundredths of an acre of land, be the same more or less.

Saving, excepting, and reserving out of said premises so much thereof as was reserved by David A. Ogden in his deed of the foregoing described premises to Jason Fenton for the purpose of cutting a canal through said premises. This reserved parcel is described in said deed as follows:

Beginning at a stone corner on the westerly line of the lot above described 3 chains and 70 links from the southwest corner of said lot and thence continuing on the westerly line of said lot toward the river 61 links to a stone corner; thence across the said lot to the easterly line thereof so as to be 1 chain and 42 links distant from the northeast corner thereof; thence along the easterly line of the said lot toward East North Street 61 links; thence across the said lot on a line parallel with the said northerly line last mentioned and 61 links distant therefrom to the place of beginning.

Containing nine hundredths of an acre of land be the same more or less.

Also saving, excepting, and reserving all that part of said premises which were heretofore conveyed by Peter Dalton to Elizabeth Fenton by deed dated 4th June, 1862, and recorded in St. Lawrence County clerk's office 18th March, 1864, at 5 o'clock p. m., in Liber No. 70C of Deeds, at page 399, &c., and in said deed described as follows:

All that certain piece or parcel of land situate on the northerly side of east North Street in the village of Waddington, aforesaid, the beginning corner of which lot is to be ascertained by running the following lines and distances, that is to say, begin at the northwesterly corner of the house formerly occupied by Judge Richards, which is the intersection of the easterly side of Grasse Street and southerly side of East North Street, and thence northeasterly along the southerly side of East North Street seven chains and two links; thence northwesterly at right angles across East North Street one chain and fifty links to the northerly side of said street, being the place of beginning, and running thence north twenty degrees west two chains and sixty-nine and one-half links at right angles from said street to

a post; thence north seventy degrees east one chain and fifty links to a post; thence south twenty degrees east two chains sixty-nine and one-half links to the northerly line of East North Street; thence south seventy degrees west along the line of said street one chain and fifty links to the place of beginning.

Containing forty hundredths of an acre of land.

Being the same premises which were conveyed by Frances A. Dalton to Andrew Allison Logan by deed dated 6th November, 1905, and recorded in St. Lawrence County clerk's office 3d March, 1906, at 9 a. m. in Liber 167C of Deeds, at page 1441, &c.

All the above-described premises are conveyed together with the rights, privileges, and easements which appertain or have been heretofore conveyed with each and every one of the above described pieces or parcels of land, but particularly all of the easements and privileges which are provided for by a certain deed or agreement made by and between Joshua Waddington and Thomas Ludlow Ogden, parties of the first part, and George Redington, party of the second part, bearing date on the 20th of March, 1831, and recorded in St. Lawrence County clerk's office 31st May, 1831, at 9 o'clock a. m., in Liber 13 of Deeds, at page 359, &c., and also subject to all servitudes, conditions, and covenants created in and by such deed or agreement and affecting each and every of said parcels of land whether the same are above named or not.

Together with the appurtenances and all the estate and rights of the said party of the first part in and to the said premises or any part thereof.

To have and to hold the above granted premises unto the said party of the second part, its successors and assigns forever.

And the said J. Wesley Allison, one of the parties of the first part, doth covenant with the said party of the second part that he, the said J. Wesley Allison, one of the parties of the first part, will forever warrant the title to said premises.

In witness whereof, the said parties of the first part have hereunto set their hands and seals the day and year first above written.

J. Wesley Allison,
Minnie E. Allison.

In presence of

State of New York,
County of St. Lawrence, ss.

On this 10th day of July in the year of our Lord one thousand nine hundred and seven, before me, the undersigned, personally came and appeared J. Wesley Allison and Minnie E. Allison, his wife, to me personally known and known to me to be the individuals described in and who executed the foregoing instrument and they severally acknowledged to me that they executed the same.

Sellar Leishman,
Notary Public.

Exhibit A–4.

DEED OF J. WESLEY ALLISON TO NEW YORK & ONTARIO POWER COMPANY—DAM AND RIGHTS.

This indenture, made this 10th day of July in the year one thousand nine hundred and seven, between J. Wesley Allison and Minnie

E. Allison, his wife, of the village of Morrisburg, Province of Ontario, Canada, party of the first part, and the New York and Ontario Power Company, of the village of Waddington, St. Lawrence County, N. Y., party of the second part,

Witnesseth, That the parties of the first part, in consideration of the sum of one dollar lawful money of the United States of America to them in hand paid by the said party of the second part and for other good and valuable considerations, them thereunto moving, do hereby remise, release, and forever quit claim unto the said party of the second part, it successors and assigns forever, all that tract or parcel of land situate in the town of Waddington, county of St. Lawrence, and State of New York, bounded and described as follows, viz:

Beginning at the southwesterly corner of the lot of the old mill building commonly known as the Proctor Grist Mill, and situate at the southerly end of the dam erected across the south branch of the St. Lawrence River between the village of Waddington and the Isle au Rapid Plat, and running northwardly along the westerly line of said old grist mill 53 feet to its northwesterly corner; thence eastwardly along the northerly line of said mill about 23 feet to the westerly line of the dam; thence northerly along the westerly line of said dam about 635 feet to an angle in the same; thence still northerly along the westerly line of said dam about 100 feet, to the southerly line of the Wing Dam; thence westerly along the Wing Dam to the bank of the Isle au Rapid Plat where the said Wing Dam is attached to the said bank; thence easterly down the bank to low water mark in the St. Lawrence River below said Wing Dam; thence easterly along the low-water line of said river to a point where the westerly line of the water lot formerly belonging to John T. Rutherford would intersect the same if produced; thence southerly along said line to the channel of that part of the River St. Lawrence flowing south of said island; thence down said channel to a point where the easterly line of the old bridge crossing the southerly branch of the St. Lawrence River would intersect the same; thence southerly along said line to the northerly line of a certain parcel of land or water lot which was conveyed by Sarah M. Ogden to Thomas Dardis on the 23rd day of August, 1876; thence easterly along the northerly line of said lot to the northeasterly corner thereof; about 176 feet; thence at right angles southerly 110 feet to the southeasterly corner thereof; thence at right angles westerly about 176 feet to the easterly line of said old bridge; thence southerly along said easterly line to the northerly line of a parcel of land conveyed by Isaac Ogden and wife to Henry R. James on the 15th day of May, 1863; thence easterly along said northerly line 100 feet to the northeasterly corner thereof; thence southerly along said easterly line about 70 feet to the southeasterly corner thereof; thence westerly along the southerly line thereof 100 feet to the easterly line of said old bridge, thence southerly along the easterly line of said old bridge, about 550 feet to a point which would be the northerly line of said Proctor's Grist Mill lot produced; thence westerly along said line about 24 feet to the northeast corner of said grist mill lot; thence southerly along the easterly line of said grist mill lot about 15 feet to the northeasterly corner of the Dunn and Purvis lot; thence westerly along the north-

erly line of said lot 40 feet to the northwesterly corner thereof; thence southerly along the westerly line thereof 50 feet to the southerly line of said Proctor's Mill lot; thence westerly along the southerly line of said mill lot about 95 feet to the place of beginning, including all the Proctor Grist Mill lot excepting the Dunn and Purvis lot; the entire length of the dam across the south branch of the St. Lawrence River; the site of the old bridge from the Proctor Grist Mill lot to the gravel bed; and all the lands between said dam and bridge; the lands lying northerly of the wing dam and between it and low-water mark on the shore of the island so far easterly as the westerly line of the old saw mill extended and to the channel of the river easterly of said line down to the easterly line of the old bridge extended.

Together with all the water rights, rights of way, and other privileges belonging to said lands.

Also all that tract or parcel of land and land under water situate in the town of Waddington, county of St. Lawrence, and State of New York, lying in the bed of that part of the River St. Lawrence, flowing between the island known as Isle au Rapid Plat and the southerly shore and bounded and described as follows:

Beginning at a point in the easterly line or side of the bridge formerly located below the dam where the same is intersected by an extension of the southerly line of a parcel formerly in the possession of G. W. Osborne, and running thence easterly along the extension of said southerly line of said lot to a point in the westerly line of a proposed extension across the canal of Fenton Street in said village, supposed to be about three hundred feet; thence northerly along the westerly line of said proposed extension of Fenton Street aforesaid ninety-seven feet to a point; thence westerly on a line parallel with the first-mentioned line to a point in the easterly line or side of the said bridge, supposed to be about three hundred feet; and thence southerly along the easterly line or side of said bridge ninety-seven feet to the place of beginning.

Also the right to remove the stone bridge above the dam and to erect a steel bridge in its place, granted to said Andrew Allison Logan by Elizabeth M. Crapser by deed dated 24th August, 1905, and recorded in St. Lawrence County clerk's office, 21st September, 1905, in Liber No. 166C of Deeds, at page 1670, &c.

Together with the appurtenances and all the estate and rights of the said parties of the first part, in and to said premises.

To have and to hold the above granted, bargained, and described premises unto the said party of the second part, its successors and assigns forever.

In witness whereof, the said party of the first part have thereunto set their hands and seals the day and year first above written.

J. WESLEY ALLISON.
MINNIE E. ALLISON.

In presence of—

STATE OF NEW YORK,
County of St. Lawrence, ss:

On this 10th day of July in the year of our Lord one thousand nine hundred and seven, before me, the undersigned, personally came and appeared J. Wesley Allison and Minnie E. Allison, his wife, to

me personally known and known to me to be the individuals described in and who executed the foregoing instrument, and they severally duly acknowledged to me that they executed the same.

SELLAR LEISHMAN,
Notary Public.

EXHIBIT A–5.

DEED OF J. WESLEY ALLISON TO NEW YORK & ONTARIO POWER CO.—PROCTOR MILL.

This indenture, made the 15th day of September in the year one thousand nine hundred and ten, between J. Wesley Allison and Minnie E. Allison of Morrisburg, Ontario, Canada, parties of the first part, and New York and Ontario Power Company of Waddington, St. Lawrence County, State of New York, party of the second part.

Witnesseth, That the said parties of the first part, in consideration of one dollar ($1.00) and other good and valuable consideration, to them in hand paid by the said party of the second part, the receipt whereof is hereby confessed and acknowledged, have bargained, sold, remised, and quitclaimed, and by these presents, do bargain, sell, remise, and quitclaim unto the said party of the second part, and to its heirs and assigns forever, all that tract, piece, or parcel of land, situate in the village of Waddington, county of St. Lawrence, and State of New York, beginning at a point in the northerly line of the canal where the same is intersected by a continuation of the easterly side of Grass Street; thence down the northerly side of the canal N. 50° 45′ east 56 feet 1′ to a point being the place of beginning. The survey of this lot and running from thence along the easterly side of the bridge or way to the paper and flour mill N. 32° 45′ W. 64 feet 6 inches to a point thence at right angles to the last line N. 57° 15′ E. 400 feet to a point situate 1 foot 6 inches southwesterly of the northwest corner of the stone foundation of a frame dwelling house; thence S. 32° 45′ E. 136 feet to a stone corner standing on the rear line of the Bethune lot; thence along said rear line S. 44° W. 41 feet 6 inches to a stone sunk in the ground in the rear line of the yellow house lot and being in a line with the first line from the place of beginning: the survey of this lot; thence N. 32° 45′ W. 81 feet 2 inches to a point on the northerly side of the canal the place of beginning containing 5633 square feet of building ground canal and street on the southerly side of said canal as surveyed by Robert and T. B. Tate May 30th, 1838, reserving out of the same the canal which is 30 feet wide and street 20 feet wide off the southerly side of the canal which is to be used for the mutual benefit of the said party of the second part in conjunction with the other proprietors of the canal lot.

Saving and expressly reserving therefrom a certain piece or parcel of land containing 1520 square feet more particularly described in a deed of conveyance made and executed by Abel T. Montgomery and Mariette his wife to David A. Orviss bearing date February 4th, 1853, and recorded June 29th, 1853, at 7 p. m. in Liber No. 46A of Deeds, page 567, etc.

Property covered by this deed being the same property conveyed to J. Wesley Allison by Ellen M. Proctor by deed bearing date August 10th, 1910.

Together with all and singular the hereditaments and appurtenances thereto belonging, or in anywise appertaining, and the reversion and reversions, remainder and remainders, rents, issues, and profits thereof, and all the estate, right, title, interest, claim, and demand whatsoever of the said parties of the first part, either in law or equity, of, in or to the above bargained premises, with the said hereditaments and appurtenances, to have and to hold the said described lands and premises, to the said party of the second part, its heirs and assigns, to the sole and only proper benefit and behoof of the said party of the second part, its heirs and assigns forever.

In witness whereof, the said parties of the first part have hereunto set their hands and seals the day and year first above written.

J. WESLEY ALLISON [L. S.]
MINNIE E. ALLISON [L. S.]

In presence of—

STATE OF NEW YORK,
County of St. Lawrence, City of Ogdensburg, ss:

On this 12th day of November, in the year one thousand nine hundred and ten, before me, the subscriber, personally appeared J. Wesley Allison and Minnie E. Allison to me personally known to be the same persons described in and who executed the foregoing instrument, and they acknowledged to me that they executed the same.

JOANNA SPRATT,
Notary Public.

EXHIBIT A–6.

DEED OF JOHN PORTEOUS TO W. S. CONNOLLY.

This indenture, made the 23d day of November in the year one thousand nine hundred and twelve, between John Porteous and Sarah C. Porteous, his wife, of the town and village of Waddington, county of St. Lawrence and State of New York, parties of the first part, and Walter S. Connolly, of the city of Hamilton, Province of Ontario and Dominion of Canada, party of the second part,

Witnesseth, That the said party, of the first part, for and in consideration of five hundred dollars ($500.00), lawful money of the United States, paid by the said party of the second part, do hereby grant and release unto the said party of the second part, his heirs and assigns forever,

All that tract or parcel of land, situate in the town of Waddington, county of St. Lawrence and State of New York, and known as the easterly end of "Ogden Island" or "Isle Au Rapid Plat."

Commencing at a point at low water mark on the southerly shore of said Ogden Island, easterly from the projected middle line of Oak Street 116 feet; thence in a northerly direction about 60 feet to a stake on the escarpment; thence in a southeasterly direction 514 feet to a stake and continuing in the same direction to low water

mark; thence westerly along low water mark to place of beginning, containing about one acre of land, more or less, with privilege to second party to excavate and remove said land.

Also all the riparian rights belonging to the parties of the first part on the southerly shore of said Ogden Island, from the easterly boundary of the premises herein first described, to the westerly line of said "Porteous Farm" which now exist or may be created by locating a dam or power house on the land herein conveyed or elsewhere.

Also sufficient land to make a safe landing or anchorage for a dam and power house at any place on the land of the said parties of the first part, but not further east than the easterly boundary of parcel of land herein first described.

The parties of the first part give to the party of the second part the right to locate and work all the necessary plant and apparatus on land of parties of the first part, adjoining the said anchorage and power house and dam; said power house, anchorage and dam must be located westerly of the easterly boundary of that parcel of land herein first described.

And it is agreed by the party of the second part that said party of the second part will cover the northerly end or anchorage of said dam that extends into the bank by at least three foot of soil.

And the party of the second part agrees to riprap with stone or other material, all the shore line and bank hereinbefore mentioned, lying or being above the power house or dam site, also southerly from the easterly line of that parcel of land herein first described, to prevent the washing away of the bank by the proposed high water.

Also all that other piece or parcel of land situate on the northerly shore of said "Ogden Island" or "Isle Au Rapid Plat" described as follows:

Commencing at a stake 178 feet in an easterly direction from a monument marked "36" and erected by the International Joint Commission on Waterways, for the purpose of indicating the boundary line between the United States and Canada; proceeding thence in a northerly direction a distance of approximately 62 feet to low water mark on northerly shore of said "Ogden Island"; thence along low water mark in a westerly direction a distance of approximately 100 feet; thence in a southerly direction a distance of about 62 feet to a stake parallel to first line and distant from said monument No. 36 78 feet; thence proceeding southerly along said line a distance of 100 feet to a stake; thence turning at right angles easterly along a line 100 feet to a stake; thence turning at right angles northerly along a line 100 feet to a stake to a place of beginning, comprising three hundred seventy-two thousandths (372/1000) of an acre of land.

The foregoing description herein made of the property herein conveyed is intended to comply with and be governed by a map or survey made by B. B. Tucker, bearing date the 18th day of November, 1912, and recorded in the St. Lawrence County clerk's office, to which reference is made for a more minute and exact description.

Together with the appurtenances; and all the estate and rights of the said parties of the first part in and to said premises, to have and to hold the above granted premises unto the said party of the second part, his heirs and assigns forever.

And the said John Porteous doth convenant with the said party of the second part as follows:

That the party of the second part shall quietly enjoy the said premises; that the said John Porteous will forever warrant the title to said premises.

In witness whereof the said parties of the first part have hereunto set our hands and seals the day and year first above written.

In presence of

JOHN PORTEOUS. [L. S.]
SARAH C. PORTEOUS. [L. S.]

STATE OF NEW YORK,
County of St. Lawrence, Town of Waddington, ss:

On this 25th day of November, in the year one thousand nine hundred and twelve, before me, the subscriber, personally appeared John Porteous and Sarah C. Porteous, his wife, to me personally known to be the same persons described in and who executed the foregoing instrument, and they severally acknowledged to me that they executed the same.

SELLAR LEISHMAN,
Notary Public.

EXHIBIT A–7.

DEED OF J. WESLEY ALLISON TO W. S. CONNOLLY.

This indenture, made the 26th day of March, in the year one thousand nine hundred and twelve, between J. Wesley Allison and Minnie E. Allison, his wife, of Waddington, N. Y., parties of the first part, and Walter S. Connolly, of Hamilton, Ontario, Canada, party of the second part,

Witnesseth, That the said parties of the first part, for and in consideration of the sum of two thousand dollars ($2,000.00) to them duly paid have sold, and by these presents do grant and convey to the said party of the second part, his heirs and assigns, all that tract or parcel of land situate in the village of Waddington, county of St. Lawrence, and State of New York, described as follows upon a map entitled, "Plan of the lots on the northerly side of East North Street, in Waddington, belonging to the heirs of T. L. Ogden showing the eight shares thereof as allotted by Messrs. Shipman & Tate in December, 1853," which map, together with certain other maps of the property of the estate of said Thomas L. Ogden and certain instruments of confirmation of the partition of the said property in accordance therewith, is recorded in the county clerk's office of said county of St. Lawrence in Book of Deeds No. 50A, at page 283, as canal lot No. 14, colored brown, and being the third lot below the bridge and being the same property owned by William L. Forsythe, sr., on April 21st, 1884, and recorded in 120B of Deeds, at page 19. The above is the same property as was deed to the party of the first part by deed in infancy proceeding dated February 20th, 1912, and March 4, 1912.

With the appurtenances and all the estate, title, and interest therein of the said party of the first part. And the said J. Wesley Allison

does hereby covenant and agree to and with the said party of the second part, his heirs and assigns, that the premises thus conveyed in the quiet and peaceable possession of the said party of the second part, his heirs and assigns, will forever warrant and defend against any person whomsoever lawfully claiming the same or any part thereof.

In witness whereof, The said parties of the first part have hereunto set their hands and seals the day and year first above written.

J. WESLEY ALLISON. [L. S.]
MINNIE E. ALLISON. [L. S.]

In presence of—
M. G. EDWARDS.

STATE OF NEW YORK,
County of St. Lawrence, city of Ogdensburg, ss:

On the 26th day of March, in the year one thousand nine hundred and twelve, before me, the subscriber, personally appeared J. Wesley Allison and Minnie E. Allison, to me personally known to be the same persons described in and who executed the foregoing instrument, and they acknowledged to me that they executed the same.

[SEAL.] JOANNA SPRATT, *Notary Public.*

STATE OF NEW YORK,
St. Lawrence County Clerk's Office:

I hereby certify that I have compared the foregoing copy with the original deed, recorded Sept. 16, 1918, in this office, and that it is a true and correct transcript therefrom, and of the whole of said original.

In witness whereof, I have hereunto set my hand and seal of office, at Canton, this 17 day of Sept., 1918.

[SEAL.] W. W. HALÉE, *Clerk.*

EXHIBIT A–8.

DEED OF J. WESLEY ALLISON TO NEW YORK & ONTARIO POWER CO.

This indenture, made the 28th day of July in the year one thousand nine hundred and eleven, between J. Wesley Allison and Minnie E. Allison, his wife, parties of the first part, and the New York and Ontario Power Company, party of the second part.

Witnesseth, That the said parties of the first part, for and in consideration of the sum of one dollar and other valuable consideration ($1.00) lawful money of the United States paid by the said party of the second part do hereby grant and release unto the said party of the second part its heirs and assigns forever.

All that tract or parcel of land situate in the village of Waddington, county of St. Lawrence and State of New York and bounded as follows: Beginning on Grasse Street at the northwesterly corner of Samuel Clark's lot and running thence north along the line of said Grasse Street to the intersection of Canal Street, thence east along the line of Canal Street to the northwesterly corner of Thomas Pea-

cock's lot; thence south along the line of said lot to northeasterly corner of the Peter Dalton lot (now owned and occupied by George C. Wilson); thence west along the line of said Dalton or Wilson lot and Samuel Clark lot to place of beginning. The premises above described being the same as those conveyed by deed bearing date 6th day of April, in year 1910, by Ella J. McBreen and others to Edward L. Fay and others, which deed was duly recorded in St. Lawrence County clerk's office on the 12th day of May, 1910 in Liber 176B of Deeds, at page 1008.

Together with the appurtenances; and all the estate and rights of the said party of the first part in and to said premises.

To have and to hold the above granted, bargained, and described premises unto the said party of the second part, its heirs and assigns forever.

And the said J. Wesley Allison do covenant with the said party of the second part as follows:

That the party of the second part shall quietly enjoy the premises.

That the said J. Wesley Allison will forever warrant the title to said premises.

In witness whereof the said party of the first part has hereunto set his hand and seal the day and year first above written.

MINNIE E. ALLISON. [L. S.]
J. WESLEY ALLISON. [L. S.]

In presence of—
ROBT. THOMPSON.

STATE OF NEW YORK,
County of St. Lawrence, town of Waddington, ss:

On this 28th day of July in the year one thousand nine hundred and eleven before me, the subscriber, personally appeared J. Wesley Allison and Minnie E. Allison, his wife, to me personally known to be the same persons described in and who executed the foregoing instrument and they acknowledged to me that they executed the same.

[SEAL.] ROBT. THOMPSON, *Notary Public.*

STATE OF NEW YORK,
St. Lawrence County Clerk's Office:

I hereby certify that I have compared the foregoing copy with the original deed recorded Sept. 17, 1918, in this office, and that it is a true and correct transcript therefrom, and of the whole of said original.

In witness whereof, I have hereunto set my hand and seal of office, at Canton, this 17 day of Sept., 1918.

W. W. HALÉE, *Clerk.*

EXHIBIT A–9.

Exhibit A–9, being abstract (substitute deed) of Dunn and Rutherford to W. S. Connolly, was not filed by attorney for applicant, the original deed not being procurable.

EXHIBIT A–10.

ACT OF 1808, CHAPTER 121, STATE OF NEW YORK.

(Passed April 1st, 1808.)

An Act for opening and establishing a lock navigation on the River St. Lawrence in the town of Madrid.

Whereas it has been represented to this legislature by various petitions from the inhabitants of the county of St. Lawrence, that by means of a certain dam lately erected and made by Joshua Waddington, David A. Ogden, and Thomas L. Ogden across a branch of the River St. Lawrence running between the town of Madrid, and a certain island called "Isle au Rapid Plat," the water is made comparatively smooth both below and above it and that if boats could be transported over the said dam by means of a lock or locks, the navigation of the said river would not only be greatly improved, by avoiding a very impetuous current for several miles, but boats would be enabled to pass up the river under the American shore; Therefore

Be it enacted by the People of the State of New York represented in Senate and Assembly, That Joshua Waddington, David A. Ogden, and Thomas L. Ogden, their heirs and assigns, shall have full right, power, and authority to construct and make a canal in such manner and direction as they shall judge proper, between a certain island in the River St. Lawrence known and called by the name of "Isle au Rapid Plat" and the banks along the American side of the said river, and to construct in such canal, and in the waters and places adjoining the same in addition to the dam already erected all such locks, dams, and other works and devices as shall be necessary for the purpose of making a complete navigable water communication between the said island and the American side of the said river, and that they, their heirs and assigns may take the water which shall be contained within any lock, dam, pond, dyke, or other improvement made by them and make use of the same, either on their sole account or in connexion with any person or persons for mills or other works for which the use of water is necessary which may be erected or constructed by them, or to grant bargain, sell, or otherwise to dispose of the use of the said water to any person or persons for any lawful purpose and the monies, rents, and profits resulting therefrom to take and receive for their own use and benefit in addition to the tolls and profits herein after mentioned and allowed to be taken.

And be it further enacted, That the said Joshua Waddington, David A. Ogden, and Thomas L. Ogden, their heirs and assigns shall be and hereby are authorized to demand, take, and receive from every boat or vessel passing through such canal or locks or either of them so to be made a certain toll not to exceed at or after the rate of twenty-five cents per ton of said boat or vessel: *Provided, nevertheless*, That for all boats or vessels under the burthen of two tons, the said Joshua Waddington, David A. Ogden, and Thomas L. Ogden, their heirs and assigns shall be authorized to demand, take, and receive the sum of fifty cents and no more, and for any boat

or vessel exceeding the burthen of six tons the sum of one dollar and fifty cents, and no more.

And be it further enacted, That if the said canal and locks shall not within the period of three years from and after the first day of July next be made and completed so that a boat or vessel of fifty feet in length and ten feet in breadth and two feet draught of water may pass and repass the same, then and in such case all the rights, powers, and privileges hereby granted and vested in the said Joshua Waddington, David A. Ogden, and Thomas L. Ogden, their heirs and assigns shall cease and determine.

And be it further enacted, That the duration of this act is hereby limited to seventy-five years, after which time all the powers, privileges, and advantages granted by it shall cease and determine.

STATE OF NEW YORK,
Office of the Secretary of State, ss:

I have compared the preceding with the original law on file in this office, and do hereby certify that the same is a correct transcript therefrom, and of the whole of said original law.

Given under my hand and the seal of office of the Secretary of State, at the city of Albany, this seventeenth day of May, in the year one thousand eight hundred and ninety-four.

[SEAL.] JNO. PALMER,
Secretary of State.

EXHIBIT A–11.

ACT OF 1826, CHAPTER 280, STATE OF NEW YORK, EXHIBIT A–11.

AN ACT confirming to David A. Ogden certain lands situate in a branch of the River St. Laurence.

(Became a law April 17th, 1826, with the approval of the governor. Passed, by a two-thirds vote.)

Be it enacted by the people of the State of New York represented in Senate and Assembly, That David A. Ogden of the county of St. Laurence, being the proprietor of both sides of a branch of the River St. Laurence, in the town of Madrid, and across which river he has erected a dam and locks in pursuance of an act of the legislature of this State, passed April 1, 1808, shall, and he is hereby declared to, be vested with all the rights of the people of this State to the lands situate below the said dam and which by reason thereof has been rendered susceptible of improvement and extending down the branch of said river, from the said dam to the navigable waters thereof. To have and to hold to the said David A. Ogden, his heirs and assigns, forever: *Provided*, That nothing contained herein shall operate to prevent the people of this State, at the expiration of the term of seventy-five years from the said first day of April, one thousand eight hundred and eight, to alter and regulate the tolls on boats passing said locks as they in their discretion may deem proper: *And provided further*, That nothing in this act contained shall be taken to prevent or in any manner to hinder the State from taking from the said branch of the River Saint Lawrence, below the said

dam, any water for the use of any navigable canal or canals which may be constructed by the State or by virtue or in pursuance of any act of the legislature of this State.

STATE OF NEW YORK,
Office of the Secretary of State, ss:

I have compared the preceding with the original law on file in this office, and do hereby certify that the same is a correct transcript therefrom, and of the whole of said original law.

Given under my hand and the seal of office of the secretary of State, at the city of Albany, this twenty-first day of September, in the year one thousand nine hundred and eighteen.

[SEAL.] C. W. TAFT,
Second Deputy Secretary of State.

EXHIBIT A–12.

MORTGAGE OF NEW YORK & ONTARIO POWER CO. TO KNICKERBOCKER TRUST CO.

This indenture, made this 1st day of August, 1907, by and between the New York & Ontario Power Company, a stock corporation duly organized and existing under and by virtue of the laws of the State of New York, and located and having its principal office in the village of Waddington, St. Lawrence County, State of New York, party of the first part, and Knickerbocker Trust Company, of the city of New York, State of New York, as trustee for the purpose hereinafter set forth, party of the second part,

Witnesseth:

Whereas said party of the first part desires to raise money for the purpose of discharging and paying certain debts against said corporation, heretofore necessarily incurred in its business, and to borrow money for the transaction of its business and for the exercise of its corporate rights, privileges, and franchises, and for other lawful purposes of its incorporation and for the improvement of its property, has by a resolution of its board of directors authorized the making and issuing of its negotiable coupon bonds, each of the denomination of five hundred ($500) dollars, numbered consecutively from one to four thousand inclusive, such bonds to amount in the aggregate to two million ($2,000,000) dollars, and to bear date the first day of August, 1907, payable thirty years from their date in gold coin of the United States of America, of or equal to the present standard of weight and fineness, and bearing interest at the rate of five per cent per annum, payable in like gold coin semiannually on the first days of August and February in each year, until said sum shall be fully paid upon presentation and surrender at the office aforesaid of the interest coupon hereto annexed as the same become due respectively.

And whereas all of said bonds are to be sealed with the corporate seal of said New York and Ontario Power Company, signed by its president and secretary, with the certificate of the trustee hereunder indorsed thereon, and each of said coupon bonds to have interest cou-

pons attached, which said bonds, coupons, and certificates are all to be substantially of the following tenor, that is to say:

United States of America,
State of New York.

New York and Ontario Power Company First Mortgage 5% Gold Bond.

No. —— $500.00

For value received, the New York and Ontario Power Company promises to pay to the bearer, or, if this bond be registered, to the registered holder thereof, at the office of the Knickerbocker Trust Company, in the city of New York, State of New York, the sum of five hundred ($500) dollars, in gold coin of the United States of America, of or equal to the present standard of weight and fineness, on the first day of August A. D. 1937, and to pay interest thereon semiannually from the first day of August A. D. 1907, at the rate of five per centum per annum in like coin on the first days of August and February in each year until said principal sum shall be fully paid, upon presentation and surrender at the office aforesaid of the interest coupons hereto annexed as the same become due respectively.

This bond is one of a series of four thousand bonds of said New York and Ontario Power Company of like amount, tenor, and date, amounting in the aggregate to the sum of two million ($2,000,000) dollars, numbered consecutively from one to four thousand, both inclusive, all of said bonds are equally secured by a first mortgage or deed of trust, bearing date the first day of August, 1907, made and executed by the New York and Ontario Power Company to the Knickerbocker Trust Company of New York City, New York, as trustee, of and upon all of the real and personal property now owned or hereafter acquired by the said New York and Ontario Power Company, situate in the village of Waddington, St. Lawrence County, N. Y., known as the Waddington Water Power property, together with all the properties, franchises, and water rights connected therewith, subject to the terms and conditions of which said mortgage this bond is issued and held.

This bond may be registered in the manner and with the effect provided in said mortgage.

This bond shall not be valid or obligatory until the certificate endorsed hereon shall be signed by the trustee under said mortgage.

In witness whereof, said New York and Ontario Power Company has caused its corporate seal to be hereunto affixed and attested by its secretary, and these presents to be signed by its president, this first day of August, A. D. 1907.

NEW YORK AND ONTARIO POWER COMPANY,
By DAVID J. CRICHTON, Jr., *President.*

Attest:
GARNETT H. MELDRUM, *Secretary.*
[Corporate seal of New York and Ontario Power Company.]

(Coupon.)

New York and Ontario Power Company will pay to the bearer at the office of Knickerbocker Trust Company in the city of New York, twelve dollars and fifty cents ($12.50) United States gold coin, on the first day of February, A. D. 190—, for six months' interest on its first mortgage bond No. ——.

Coupon No. ——

WILLIAM F. BURT, *Treasurer.*

(Trustee's Certificate.)

Knickerbocker Trust Company hereby certifies that the within bond is one of the series and issue described in the mortgage therein mentioned.

KNICKERBOCKER TRUST COMPANY,
Trustee.
By ——— ———, *Vice President.*

[Written on margin of first folio of mortgage:]

Serial No. 0528. Received May 17, 1910, of New York & Ontario Power Company one hundred fifty-five ($155) as tax on additional bonds to amount of $31,000, as per statement filed May 17, 1910. C. N. Reynolds, Dep. Clerk.

Serial No. 0528. Received Oct. 18, 1910, of New York & Ontario Power Company twenty-five hundred ($2,500) dollars as tax on additional amount of $500,000 as per statement filed Oct. 18, 1910. C. N. Reynolds, Dep. Clerk.

And whereas the written consent of the stockholders owning at least two-thirds of the stock of the said New York and Ontario Power Company has been given to the execution of this mortgage or deed of trust, and to the issue and execution of said bonds, and a certificate under the seal of said New York and Ontario Power Company that such consent was so given, subscribed, and acknowledgeed by the president and secretary of said New York and Ontario Power Company has been filed and recorded in the office of the clerk of the county of St. Lawrence, in which said county said company has its principal place of business;

And whereas, at a meeting duly called for that purpose, this mortgage or deed of trust was submitted to the board of directors of the New York and Ontario Power Company, and it was then and there duly resolved that this mortgage or deed of trust be executed by the president of said company, in its name and on its behalf, and that the corporate seal of said company be hereunto affixed and attested by the secretary, and that this mortgage or deed of trust be duly delivered on behalf of said company to the Knickerbocker Trust Company herein mentioned: now therefore, this indenture

Witnesseth, That in order to secure the payment of the principal and interest of the bonds aforesaid at any time outstanding according to their tenor and effect, and the fulfillment of the conditions and covenants hereinafter contained, and irrespective of their time of issue, and for and in consideration of the purchase and acceptance of said bonds by the holders thereof, and of the sum of one dollar to it duly paid by the trustee, party of the second part, at or before the ensealing of these presents, the receipt whereof is hereby acknowledged, the said New York and Ontario Power Company, party of the first part, has granted, bargained, sold, aliened, remised, conveyed and confirmed, assigned, transferred, and set over, and by these presents does grant, bargain, sell, alien, remise, convey and confirm, assign, transfer, and set over unto the said trustee, the party of the second part, and its successor or successors forever, all and singular, the following described property:

All that tract or parcel of land situate in the town of Waddington, county of St. Lawrence, and State of New York, and briefly described as follows:

All that part of the dam in and across the southerly branch of the Saint Lawrence River at Waddington in said county, lying westerly of the water lot of John T. Rutherford, and running thence westerly to the bank or shore of the island including the land and land under water lying between said dam and low-water mark on the south shore of the island. Also all that other piece or parcel of land situate in the town of Waddington, County of St. Lawrence, and State of New York, and briefly described as follows:

Beginning at a point on the wing dam sixty-seven feet six inches southwesterly from the northeasterly corner of said dam and running thence along said wing dam and the same course continued north thirty-seven degrees, east one hundred and fourteen feet six inches to the easterly line of the old dam; thence north thirty-one and a half degrees west being a continuation of the easterly line of the old dam to the channel of that part of the River St. Lawrence flowing southerly of the island called "Isle au Rapid Plat;" thence up the channel of said river by the windings thereof to a point which

would be intersected by a line run at right angles with said wing dam from the place of beginning; thence southerly along said last-mentioned line one hundred feet to the place of beginning, together with all the rights and privileges belonging to or in any way appertaining to said premises hereby granted in the same manner and to the same extent as such privileges are now held and possessed by the said party of the first part. Also all that other parcel of land situate in the village of Waddington aforesaid, and bounded and described as follows:

Beginning at a point forty feet east from the corner of the wing dam and running thence thirty-seven degrees, east one hundred and twenty-five feet to easterly line of the bridge below the dam; thence northerly and on a line with the easterly line of said bridge to the channel of that part of the River St. Lawrence flowing south of the island; thence up said channel following the windings thereof to a point being the northeasterly corner of a lot deeded to said J. F. Rutherford by Richard Harison and Harriet, his wife; thence southerly along the easterly line of said lot to the place of beginning, with the right of way to said premises from the bridge below the dam granted by Issac Ogden and Sarah, his wife, to Richard Harison and James G. Skinner subject to a right of way granted by Richard Harison and James G. Skinner to Isaac Ogden, this conveyance is subject to the provisions of an agreement made between Joshua Waddington and Thomas L. Ogden of the first part and George Redington of the second part dated the 20th day of March, 1831, and to all the conditions therein contained. The deed conveying the foregoing premises hereinafter mentioned contained a provision that the party of the first part, Elizabeth Crapser, grants to the party of the second part, Andrew Allison Logan, or to his assigns, the right to remove all or any part of the stone bridge above the dam, but upon the express condition that the said Logan or his assigns shall erect in its place in such manner as not to impede travel, and forever maintain at their own cost and expense for the use of the people of Ogden's Island, a steel structure of not less than fourteen feet in width and of sufficient strength to carry with safety a weight of ten tons. The right to remove said bridge and to erect and maintain in its place a steel structure is to be construed as a covenant running with the premises and water hereby conveyed and is a charge upon said premises and betterments that may be put thereupon. The premises hereinbefore described being the same which were conveyed by Elizabeth M. Crapser to Andrew Allison Logan by warranty deed dated August 24th, 1905, and recorded in St. Lawrence County clerk's office, September 21st, 1905, at two o'clock p. m., Liber No. 166C of Deeds, at page 1670, &c.

SECOND.

All that certain lot or parcel of land situate between the village of Waddington in the county of St. Lawrence and State of New York and a certain island in the river St. Lawrence called "Isle au Rapid Plat," the said lot being situate below the stone dam having its center below and adjoining the dam the middle of flume No. 4 computing from the old locks and distant therefrom about 406 feet 7 inches, measuring from the lower or easterly side of said dam and adjoining the southeasterly foundation of said locks and begins 48 feet 3 inches

northerly from the center of said flume and runs southerly in front or below the said dam adjoining thereto 96 feet 6 in., thence at right angles to the said dam 100 feet; thence parallel with the said dam 96 feet 6''; thence at right angles to the said dam and parallel with the second line 100 feet to the place of beginning, but if the road laid out below the said dam across the said river shall extend easterly below the said dam more than the said 100 feet, then the easterly line of said lot shall extend to the road or bridge. Together with the right to take and use so much water from the said dam through the said flume as shall be requisite and necessary for the manufacture of paper or any other thing upon the said lot of land or for any hydraulic purpose, and also with the right of passing and repassing from the main shore to any part of the said lot by and along the said road or bridge. Subject to a certain agreement concerning the future reparation and maintenance of the said dam and bridge made between Joshua Waddington and Thomas L. Ogden of the first part and George Redington of the other part, dated the 20th day of March, 1831.

PARCEL TWO.

Also all that water lot or parcel of land covered with water situate in the bed of the river St. Lawrence in the town of Madrid (now the town of Waddington) in the county of St. Lawrence and State of New York below and adjoining the stone dam erected between the village of Waddington and the island called "Isle au Rapid Plat," bounded northwardly by the line of the grist mill lot formerly owned by Messrs. Waddington and Ogden heirs, being a line running parallel with and distant 14½ feet from the southerly wall of their stone grist mill; southerly by the line of the "paper mill lot" and extending between these lines from the said dam down the river St. Lawrence to the bridge, containing in breadth along the dam 85 ft. more or less, and in length from the dam to the bridge 100 feet more or less. Together with the right and privileges of drawing off the water of the river or pond above said dam through the flumes contained therein opposite to the said lot and of using and employing the same for hydraulic purposes, and also the right and privilege of passing and repassing the said bridge from the village to the above-described lot with horses and others teams, &c., subject, however, to a certain agreement concerning the future support and maintenance of the said dam and bridge made between Joshua Waddington and Thomas L. Ogden of the first part and George Redington of the other part, bearing the date March 20th, 1831. Subject to all the conditions and provisions thereof so far as the same are or may be applicable to the owner of the above-described premises.

PARCEL THREE.

Also all that certain parcel of land on which stands the walls of a stone building erected for a mill, situate in the town of Waddington, county of St. Lawrence and State of New York, being land lying above and under water in part, in the bed of the river St. Lawrence, adjoining and below the stone dam erected between the village of Waddington and "Isle au Rapid Plat" and including so much of

the dam as pertains to and is necessary to said lot, and is bounded as follows:

Beginning at the top of said dam at a point southerly 14 feet 6 inches from the southerly line of said stone mill extending from said dam, and running thence northerly and parallel with said dam to a point 10 feet northerly of the northerly line of said mill extending above said dam; thence easterly at right angles and parallel with said northerly line of said mill to a point 100 feet below the bridge leading from the main shore; thence at right angles southerly and parallel with said dam to point where a line on such course extended would intersect a line extended from the place of beginning at right angles with said dam; thence from such point westerly on a line parallel with the southerly line of said stone mill and fourteen feet six inches southerly therefrom to the place of beginning.

Together with the right and privilege of drawing and using for hydraulic and other purposes the water of said river, and of passing and repassing on and using the said bridge below the said dam, subject, however, to a certain agreement between Joshua Waddington and Thomas L. Ogden, of one part, and George Redington, of the other part, dated March 20th, 1831, and recorded in the office of the clerk of St. Lawrence County in Book No. 13 of Deeds, page 359, and to all the stipulations and provisions contained therein in respect to the reparation and maintenance of the bridge and the portion of the said stone dam included in the above description.

PARCEL FOUR.

Also all that tract or parcel of land situate in the town of Waddington, county of St. Lawrence and State of New York, below and adjoining the dam erected across that part of the River St. Lawrence lying between Ogdens Island and the southerly shore of said river, bounded and described as follows:

Beginning at the northwesterly corner of the paper-mill lot, formerly owned by Henry R. James and running thence northerly along said dam 10 feet to a point; thence easterly on a line parallel with the northerly line of said paper-mill lot about 100 feet to the bridge below the dam; thence southerly along said bridge 10 feet to the northerly line of said paper-mill lot; and thence westerly along said northerly line about 100 feet to the place of beginning. Subject to all covenants and conditions contained in a certain agreement bearing date March 20th, 1831, between Joshua Waddington and Thomas L. Ogden of the one part and George Redington of the other part, concerning the reparation and maintenance of the said dam and the bridge below the same.

PARCEL FIVE.

Also all that lot or parcel of land situate in the village of Waddington, in the county of St. Lawrence and State of New York, and on the dam leading from said village of Waddington to the island known as "Isle au Rapid Plat" and beginning at a point on said dam which is 26 feet north from the northwest corner of the stone mill formerly owned by Henry R. James and running thence easterly along the northerly line of said James lot 300 feet more or less to the navigable waters of the river; thence northerly 110

feet more or less to a point from which a straight line drawn west shall strike the dam at a distance of 3 feet from the gristmill lately owned by J. T. Rutherford; thence westerly along said line to the dam, striking the same at a point 3 feet distant from the southeast corner of the said Rutherford gristmill; and thence southerly along the said line of the dam 100 feet more or less to the place of beginning, with the right to construct flumes therein and to draw water from the pond above the dam for hydraulic purposes.

Being the same premises which were conveyed by the First National Bank of Canton, N. Y., to Andrew Allison Logan by deed dated 15th February, 1902, and recorded in St. Lawrence County clerk's office 15th April, 1902, at ten a. m. in Liber No. 158C of Deeds, at page 1829, &c.

THIRD.

All the lands, premises, and privileges which were conveyed by the village of Waddington to Andrew Allison Logan by deed dated 31st May, 1906, and recorded in St. Lawrence County clerk's office 11th June, 1906, in Liber No. 168A of Deeds at page 404, &c., and in said deed described as follows:

"All that tract or parcel of land situate in the village of Waddington, county of St. Lawrence and State of New York, upon 'a' and below the dam across the St. Lawrence River at Waddington aforesaid, known as the woolen factory lot, bounded as follows:

"Northerly by the old paper-mill lot; easterly by the bridge below said dam; southerly by said mill lot; and westerly by said dam, together with water power and water rights and privileges to the same belonging and which appertain to the said property under the agreement made by and between the proprietors of the said dam and water power and also the hereditaments and appurtenances belonging or in any wise appertaining according to the deed of said premises dated May 1st, 1879, executed between Delos McCurdy, referee, and the late Alexander H. Lord, now deceased, which deed was duly recorded in St. Lawrence County clerk's office on the 19th day of December, 1879, in Liber 111B of Deeds, at page 24, &c.

And also all the poles, wires, street lamps, water works, water power, and water right belonging to the said party of the first part, together with the appurtenances and all the estate and rights of the said party of the first part. in and to the said premises.

FOURTH.

All the lands, premises and privileges which were conveyed to Andrew Allison Logan by two deeds, viz, one from Ellen M. Proctor, Carrie E. Rose, and Anna B. Chalmers, dated 24th December, 1903, and recorded in St. Lawrence County clerk's office 29th December, 1903, at four p. m. in Liber No. 163A of Deeds, at page 90, &c., and the other made by William W. Proctor and Jennie M., his wife, dated 4th January, 1904, and recorded in said clerk's office 15th January, 1904, at two p. m. in Liber 163A of Deeds, at page 221, etc., and in said deed described as follows:

All that certain water lot or piece of land covered with water situated in the bed of the River St. Lawrence, in the town of Madrid

(now Waddington) below and adjoining to a certain dam erected between the said village of Waddington and the island called Isle au Rapid Plat. The lot of land hereby intended to be described, beginning on the said dam, at a point distant 15 feet northwardly from the stone factory lately conveyed to Isaac Ogden; thence running northwardly along the line of the said dam 97 feet; thence easterly by a line at right angles to the said dam to the upper or westerly line of the bridge between the said island and village; thence southwardly along the westerly line of said bridge to that point therein from which a line to be run westwardly at right angles to the said dam shall intersect the same at the place of beginning, and thence westwardly by that line to the place of beginning. Together with the rights and privileges of drawing off the waters of the pond or river above the said dam through the flume constructed therein opposite to the said lot, and of using and applying the same for hydraulic purpose, and also the right and privilege of the said party of the first part, its successors and assigns, being owners or occupants of the said lot, and its or their servants or workmen of passing and repassing the said bridge from the said bridge to the said above-described lot of land and with horses, oxen, and team for the necessary purpose of any mill, factory, or other hydraulic works erected or to be erected on the said premises. Subject nevertheless to a certain agreement bearing date 20th March, 1831, made by and between the said Joshua Waddington and Thomas Ludlow Ogden of the one part, and the said George Redington of the other part, concerning the future reparation and maintenance of the said dam and bridge and to all the conditions and provisions thereof so far forth as the same are or may be applicable to the owner or owners of the premises hereby granted and conveyed and expressly charged with the performance and fulfilling of all the duties and obligations thereby declared to be incumbent on such owner or owners.

FIFTH.

All that certain stone factory or fulling mill and water lot or pieces of land covered with water situate in the bed of the River St. Lawrence, in the town of Madrid (now Waddington) and county of St. Lawrence below and adjoining the dam erected between the village of Waddington and the island called Isle au Rapid Plat. The lot of land hereby intended to be described beginning on the said dam at a point distant 12 feet northwardly from the old grist mill now occupied by Cyrus B. Martin; thence running northwardly along the said dam 152 feet, more or less to a point distant 15 feet northwardly from the northerly wall of the said factory being the south line of the water lot sold to George Redington; thence easterly along that line being on a course at right angles to the said dam; to the westerly line of the bridge running from the said village to the said island; thence southwardly along the westerly line of the said bridge to that point therein from which a line to be drawn at right angles to the said dam shall intersect the same at the place of beginning, and thence westerly by that line to the place of beginning.

Together with the right and privilege of drawing off the waters of the pond or river above the said dam through the flume constructed

therein opposite to the said factory, and through one other flume of similar dimensions to be constructed in the said dam opposite to some other part of the lot of land hereby conveyed, and of using and applying the same for hydraulic purposes, and also the right and privilege of the said party of the first part, its successors, and assigns, being owners and occupants of the said lot, and its or their servants or workmen, of passing and repassing the said bridge from the said village to the said above-described lot of land with horses, oxen, and teams for the necessary purpose of any mill, factory or other hydraulic works erected or to be erected on said premises. Saving and reserving to the said Joshua Waddington and Thomas Ludlow Ogden the right and privilege of constructing and maintaining in the said dam opposite to the lot of land hereby conveyed a flume, not exceeding three feet in width, and of conveying through the said lot by a trunk or other conduit sufficient water for the use and supply of the distillery below the said bridge or for any other use or purpose.

Subject, nevertheless, to a certain agreement bearing date 20th March, 1831, made by and between the said Joshua Waddington and Thomas Ludlow Ogden of the one part, and George Redington of the other part, concerning the future reparation and maintenance of the said dam and bridge and to all the conditions and provisions thereof so far as the same are or may be applicable to the owner or owners of the premises hereby granted or conveyed, and expressly charged with the performance and fulfillment of all the duties and obligations thereby declared to be incumbent on such owner or owners.

Being the same premises which were conveyed by James K. Rutherford as sole executor of the last will and testament of Henry B. Proctor, deceased, to Andrew Allison Logan, by deed dated 8th December, 1903, and recorded in St. Lawrence County clerk's office, 15th December, 1903, at 10.30 a. m. in Liber 162C of Deeds, at page 1720, &c.

SIXTH.

All that certain gristmill and water lot, or piece of land covered with water, situate in the bed of the River St. Lawrence, in the town of Madrid (now Waddington), county of St. Lawrence, and State of New York, below and adjoining to the dam erected between the said village and the island called "Isle au Rapid Plat," the said lot of land hereby intended to be described.

Beginning at the southwesterly corner of said mill, thence running northwardly along the same 53 feet to its northwesterly corner; thence eastwardly along the northerly line of said mill to the said dam; thence northwardly along the same 12 feet; thence eastwardly by a line at right angles to the said dam to the westerly line of said bridge; thence southwardly along the westerly line of the said bridge to that point therein where it shall be intersected by a line to be drawn eastwardly in continuation of the southerly side of said mill; thence westwardly by that line to the place of beginning. Together with the right and privilege of drawing off the water of the pond or river above the said dam and of using and applying the same for the purposes of the said mill or for any other hydraulic purpose, provided that the water so to be drawn from the said pond shall not

exceed in quantity what may be sufficient to propel six pair of sets of millstones for the grinding of wheat or corn. And also the right and privilege of passing and repassing through and along a road or passageway of at least 4 rods in width, to be left open between North Street and the canal hereinbefore mentioned. And also the right and privilege of erection and maintaining a bridge or platform from the said road or passageway to the second floor of the said mill, but so always as to leave a free and open space beneath the same for the passage of boats through a navigable canal about to be constructed along the southerly foundation wall of the said mill from the said mill pond toward the mouth of Sucker Creek. Saving and reserving, nevertheless, to the said Joshua Waddington and Thomas Ludlow Ogden, their heirs and assigns, the privilege and benefit of the said wall and the right and privilege of extending the said wall eastwardly through and along the southwardly line of the lot hereby conveyed from the said mill down to the said first-mentioned bridge, and of maintaining and keeping up the same as an embankment for the purpose of sustaining and confining the waters of the said proposed canal. Subject, nevertheless, to a certain agreement bearing date March 20th, 1831, made by and between the said Joshua Waddington and Thomas Ludlow Ogden of the one part and George Redington of the other part, concerning the future reparation and maintenance of the said dam and bridge; and to all the conditions and provisions thereof in respect to the reparation and maintenance of the said dam so far forth as the same are or may be applicable to the owner or owners of the premises hereby granted and conveyed, and expressly charged with the performance and fulfillment of all the duties and obligations thereby declared to be incumbent on the owner or owners.

Saving, however, excepting and expressly reserving from the said lot herein described, a portion of the same forty feet by fifty feet in extent which portion may be described as follows:

Beginning at the southeasterly corner of the lot heretofore described and running thence northerly along the westerly line of the bridge heretofore mentioned 50 feet; thence westerly on a line parallel to the southerly line of the lot heretofore described 40 feet; thence southerly on a line parallel with the westerly line of the said bridge to the southerly line of the lot heretofore described 50 feet; thence easterly along the southerly line of the lot heretofore described to the place of beginning.

Also all that tract or parcel of land, situate in the village of Waddington, county of St. Lawrence, and State of New York, on the north side of the canal in said village being the west part of the lot adjoining to the furnace lot and next adjoining on the east line of James Z. Skinner's tannery lot being twenty-five feet front on the canal and being of the same width on the north or river front. The said lot to run from the north bank of the canal toward the river aforesaid one hundred and fifty feet containing three thousand seven hundred and fifty square feet, it being understood and agreed that the above described lot does not extend to the river aforesaid, subject to all the conditions contained in a deed from Delide Brault to Harriet Corrons, dated the 20th day of July, 1882, and recorded in the St. Lawrence County clerk's office on the 20th day of September, 1882, in Book 116C of Deeds, at page 544.

Being the same premises which were conveyed by Bert S. Crapser to Andrew Allison Logan by deed dated 24th August, 1905, and recorded in St. Lawrence County clerk's office 31st August, 1905, at twelve m. in Liber 166C of Deeds at page 1528, &c.

SEVENTH.

All that certain lot, piece, or parcel of land situate on the northerly side of East North Street in the village of Waddington, county of St. Lawrence, and State of New York, being the lot of land on which the tannery of said Fenton is erected, the beginning corner of which lot is to be ascertained by running the following lines and distance, that is to say: Beginning at the northwesterly corner of Judge Richard's house in said village, which is the intersection of the easterly side of Grass Street, and southerly side of East North Street, and thence northeasterly along the southerly side of East North Street 7 chains and 2 links; thence northwesterly at right angles across East North Street 1 chain and 50 links to the northerly side of said street, being the place of beginning, and running from thence at right angles to said East North Street towards the St. Lawrence river 5 chains and 97 links to a stone corner standing within the high-water margin of the St. Lawrence River; thence at right angles to the last line down the river 1 chain and 50 links to a stone corner which is also within the high-water margin of said river; thence at right angles to the last line parallel to the first line 5 chains and 97 links to a stone corner standing on the northerly side of East North Street; thence up the northerly side of East North Street 1 chain and 50 links to the place of beginning.

Containing eighty-nine and one-half one-hundredths of an acre of land, be the same more or less.

Saving, excepting, and reserving out of said premises so much thereof as was reserved by David A. Ogden in his deed of the foregoing-described premises to Jason Fenton for the purpose of cutting a canal through said premises. This reserved parcel is described in said deed as follows:

Beginning at a stone corner on the westerly line of the lot above described 3 chains and 70 links from the southwest corner of said lot and thence continuing on the westerly line of said lot toward the river 61 links to a stone corner; thence across the said lot to the easterly line thereof so as to be 1 chain and 42 links distant from the northeast corner thereof; thence along the easterly line of the said lot toward East North Street 61 links; thence across the said lot on a line parallel with the said northerly line last mentioned and 61 links distant therefrom to the place of beginning.

Containing nine one-hundredths of an acre of land, be the same more or less.

Also saving, excepting, and reserving all that part of said premises which were heretofore conveyed by Peter Dalton to Elizabeth Fenton by deed dated 4th June, 1862, and recorded in St. Lawrence County clerk's office 18th March, 1864, at 5 o'clock p. m., in Liber No. 70C of Deeds, at page 399, &c., and in said deed described as follows:

All that certain piece or parcel of land situated on the northerly side of East North Street in the village of Waddington, aforesaid, the beginning corner of which lot is to be ascertained by running the

following lines and distances; that is to say, begin at the northwesterly corner of the house formerly occupied by Judge Richards, which is the intersection of the easterly side of Grasse Street and southerly side of East North Street and thence northeasterly along the southerly side of East North Street seven chains and two links; thence northwesterly at right angles across East North Street one chain and fifty links to the northerly side of said street, being the place of beginning, and running thence north twenty degrees west two chains and sixty-nine and one-half links at right angles from said street to a post; thence north seventy degrees east one chain and fifty links to a post; thence south twenty degrees east two chains sixty-nine and one-half links to the northerly line of East North Street; thence south seventy degrees west along the line of said street one chain and fifty links to the place of beginning.

Containing forty one-hundredths of an acre of land.

Being the same premises which were conveyed by Frances A. Dalton to Andrew Allison Logan by deed dated 6th November, 1905, and recorded in St. Lawrence County clerk's office 3rd March, 1906, at 9 a. m., in Liber 167C of Deeds, at page 1441, &c.

All the above-described premises are conveyed together with the rights, privileges, and easements which appertain or have been heretofore conveyed with each and every one of the above-described pieces or parcels of land, but particularly all of the easements and privileges which are provided for by a certain deed or agreement made by and between Joshua Waddington and Thomas Ludlow Ogden, parties of the first part, and George Redington, party of the second part, bearing date on the 20th of March, 1831, and recorded in St. Lawrence County clerk's office 31st May, 1831, at 9 o'clock a. m., in Liber 13 of Deeds, at page 359, &c., and also subject to all servitudes, conditions, and covenants created in and by such deed or agreement and affecting each and every of said parcels of land, whether the same are above named or not.

Also any and all other property franchises, water rights, and dams connected with what is known as the Waddington Water Power Property generally described as follows:

All that tract or parcel of land situate in the town of Waddington, county of St. Lawrence and State of New York, bounded and described as follows, viz:

Beginning at the southwesterly corner of the lot of the old mill building commonly known as the Proctor Grist Mill, and situate at the southerly end of the dam erected across the south branch of the St. Lawrence River between the village of Waddington and the Isle au Rapid Plat, and running northwardly along the westerly line of said old grist mill 53 feet to its northwesterly corner; thence eastwardly along the northerly line of said mill about 23 feet to the westerly line of the dam; thence northerly along the westerly line of said dam about 635 feet to an angle in the same; thence still northerly along the westerly line of said dam about 100 feet, to the southerly line of the Wing Dam; thence westerly along the Wing Dam to the bank of the Isle au Rapid Plat where the said Wing Dam is attached to the said bank; thence easterly down the bank to low mark in the St. Lawrence River below said Wing Dam; thence easterly along the low water line of said river to a point where the westerly line of the water lot formerly belonging to John T. Rutherford would intersect

the same if produced; thence southerly along said line to the channel of that part of the River St. Lawrence flowing south of said island; thence down said channel to a point where the easterly line of the old bridge crossing the southerly branch of the St. Lawrence River would intersect the same; thence southerly along said line to the northerly line of a certain parcel of land or water lot which was conveyed by Sarah M. Ogden to Thomas Dardis on the 23rd day of August, 1876; thence easterly along the northerly line of said lot to the northeasterly corner thereof; about 176 feet; thence at right angles southerly 110 feet to the southeasterly corner thereof; thence at right angles westerly about 176 feet to the easterly line of said old bridge; thence southerly along said easterly line to the northerly line of a parcel of land conveyed by Isaac Ogden and wife to Henry R. James on the 15th day of May, 1863; thence easterly along said northerly line 100 feet to the northeasterly corner thereof; thence southerly along said easterly line about 70 feet to the southeasterly corner thereof; thence westerly along the southerly line thereof 100 feet to the easterly line of said old bridge, thence southerly along the easterly line of said old bridge, about 550 feet to a point which would be the northerly line of said Proctor's Grist Mill lot produced; thence westerly along said line about 24 feet to the northeast corner of said grist mill lot; thence southerly along the easterly line of said grist mill lot about 15 feet to the northeasterly corner of the Dunn and Purvis lot; thence westerly along the northerly line of said lot 40 feet to the northwesterly corner thereof; thence southerly along the westerly line thereof 50 feet to the southerly line of said Proctor's Mill lot; thence westerly along the southerly line of said mill lot about 95 feet to the place of beginning, including all the Proctor Grist Mill lot excepting the Dunn and Purvis lot; the entire length of the dam across the south branch of the St. Lawrence River; the site of the old bridge from the Proctor Grist Mill lot to the gravel bed; and all the lands between said dam and bridge; the lands lying northerly of the wing dam and between it and low-water mark on the shore of the island so far easterly as the westerly line of the old saw mill extended and to the channel of the river easterly of said line down to the easterly line of the old bridge extended.

Together with all the water rights, rights of way and other privileges belonging to said lands.

Also all that tract or parcel of land and *land under water* situate in the town of Waddington, county of St. Lawrence and State of New York, lying in the bed of that part of the River St. Lawrence flowing between the island known as Isle au Rapid Plat and the southerly shore and bounded and described as follows:

Beginning at a point in the easterly line or side of the bridge formerly located below the dam where the same is intersected by an extension of the southerly line of a parcel formerly in the possession of G. W. Osborne, and running thence easterly along the extension of said southerly line of said lot to a point in the westerly line of a proposed extension across the canal of Fenton Street in said village, supposed to be about three hundred feet; thence northerly along the westerly line of said proposed extension of Fenton Street aforesaid ninety-seven feet to a point; thence westerly on a line parallel with the first mentioned line to a point in the easterly line of side of the said bridge, supposed to be about three hundred feet; and thence

southerly along the easterly line or side of said bridge ninety-seven feet to the place of beginning.

Also the right to remove the stone bridge above the dam and to erect a steel bridge in its place, granted to said Andrew Allison Logan by Elizabeth M. Crapser by deed dated 24th August, 1905, and recorded in St. Lawrence County clerk's office 21st September, 1905, in Liber No. 168C of Deeds, at page 1870, &c.

Together with all and singular the tenements, hereditaments, and appurtenances belonging to the property hereby conveyed, or in anywise thereto appertaining, and the reversions, remainders, tolls, incomes, rents, issues, and profits thereof, and also all the estate, right, title, interest, property, possession, claim, and demand whatsoever, as well in law as in equity, of the party o fthe first part, in and to the same; and any and every part thereof with the appurtenances; and also all and every other estate, right, title and interest, property, and appurtenances which the said party of the first part may hereafter acquire. To have and to hold the said above described premises, property rights, franchises and appurtenances unto the said party of the second part, and its lawful successor or successors forever.

But in trust nevertheless, for the benefit, security and protection of the persons and corporations, firms, and partnerships who may be or become holders of the aforesaid bonds and interest coupons, or any or either of them, and for enforcing the payment thereof, when payable, according to the true intent and meaning of the stipulations of this mortgage or deed of trust, and of said bonds and said interest coupons, and without preference, priority or distinction as to lien or otherwise of any of the said bonds over any of the others, by reason of priority in the time of issue or negotiation thereof, or otherwise; provided, however, and these presents are upon the express condition, that if the party of the first part, its successors or assigns shall well and truly pay or cause to be paid unto the holders of the bonds to be issued hereunder, the principal and interest to become due thereon to said holders at the times and in the manner stipulated in said bonds and in said interest coupons according to the true intent and meaning thereof and shall well and truly keep, observe and perform all and singular the covenants, promises and conditions in the said bonds hereby secured and in this indenture expressed to be kept, observed, and performed by or on the part of the said party of the first part, then these presents and the estate and right thereby granted shall cease, determine, and be void; otherwise to remain in full force. The New York and Ontario Power Company for itself, its successors and assigns, doth hereby convenant and agree with the trustee and the respective persons, corporations, firms, and partnerships who shall hold any of said bonds or coupons that the further trusts, uses, purposes, conditions, and covenants upon which said property and franchises hereby mortgaged and conveyed are to be held by the trustee and subject to which the said bonds secured hereby and to be issued and to be held by each and every holder thereof, are as follows, that is to say:

First. This mortgage or deed of trust is to be a continuing lien to secure the full and final payment of the principal and interest of all bonds which may from time to time be issued and negotiated under the same, but so that the total aggregate amount of said bonds so

issued and negotiated shall not exceed $2,000,000.00 and to be issued upon the terms and of the denominations and to mature and become payable in the manner and at the place and time or times hereinbefore stated, with interest payable as so stated.

Second. The coupon bonds intended to be secured hereby shall from time to time be executed by the New York and Ontario Power Company and delivered to the trustee, to be certified and delivered by it, and only such of said bonds as shall be certified by the trustee, by signing the certificate endorsed thereon, shall be secured by this mortgage or deed of trust or to be entitled to any lien or benefit thereunder, and such certificate of the trustee shall be conclusive evidence that the bonds so certified have been duly issued hereunder and are entitled to the benefit of the trust hereby created. One hundred and fifty thousand ($150,000) dollars, par value of the bonds hereby secured, shall be certified and delivered upon the execution hereof, to or upon the order of the president or treasurer of the party of the first part. The trustee shall from time to time thereafter deliver bonds to or upon the order of the president or treasurer of the party of the first part upon receipt of a copy of a resolution of the board of directors of the party of the first part certified under its corporate seal by its secretary or treasurer; provided, however, that such bonds shall in no event be so certified and delivered to an amount exceeding the amount of bonds which the party of the first part shall be authorized to issue by order of the Public Utilities Commission of the State of New York or other body or authority performing similar functions. A certified copy of such order shall be sufficient evidence to the trustee of the amount of bonds entitled to be issued hereunder.

Third. The New York and Ontario Power Company covenants and agrees that it will fully and entirely pay off, and satisfy the whole of said bonds to be issued hereunder, principal and interest, according to the terms thereof without delay and without deduction from either said principal or interest for any taxes, assessments, and governmental or other charges now or hereafter imposed upon the said bonds, or any interest thereon, either by the United States or by any State, county, or municipal authority which the New York and Ontario Power Company may be required to deduct therefrom.

Fourth. Until default shall be made in the payment of the principal or interest of any of the bonds hereby secured or any part thereof as and when the same shall become due and payable, or in the performance or observance of any condition, covenant, agreement, or requirement of said bonds or of this mortgage or deed of trust, the trustee shall permit and suffer the New York and Ontario Power Company, its successors and assigns, to possess, operate, and enjoy the real and personal property hereby mortgaged, with the appurtenances thereunto belonging, in any manner not inconsistent with these presents and to receive and use the tolls, incomes, rents, issues, and profits thereof.

Fifth. When and as the interest coupons annexed or to be annexed to the bonds secured hereby mature and are paid by the New York and Ontario Power Company or by any person or corporation for it and on its behalf, they shall be cancelled. All coupons maturing before the delivery of bonds by the party of the first part shall be

cut off and cancelled by the party of the second part before the delivery of such bonds.

Sixth. The New York and Ontario Power Company covenants and agrees that it shall and will, from time to time, pay and discharge before the same shall fall into arrears, all taxes, water rates, assessments, and governmental charges lawfully imposed upon the franchises and lands, and other hereby mortgaged premises, or upon any part thereof, the lien of which might or could be held to be superior to the lien hereof, and will pay and discharge all claims of every kind and nature which may hereafter become a lien upon the hereby mortgaged premises, or any part thereof, prior to the lien hereof so that the priority of this mortgage may be duly preserved, and will keep said mortgaged premises in good repair and shall not, and will not, create or suffer to be created any mechanics', laborers', or other lien or charge whatsoever upon the mortgaged premises or any part thereof which might or could be prior to the lien of these presents, or to do or suffer any matter or thing whereby the lien of these presents might or could be impaired, until the bonds hereby secured with all interest accrued thereon shall be fully paid and satisfied.

Seventh. The New York and Ontario Power Company further covenants and agrees that it shall and will at all times until said bonds hereby secured with all interest accrued thereon, shall be fully paid and satisfied, keep such parts of said mortgaged premises or property as are liable to be destroyed or injured by fire, insured against loss by fire in some solvent fire insurance company or companies authorized to transact business in the State of New York approved by the trustee to an amount equal to the insurable value of said property payable in case of loss to the trustee; and all moneys collected from such insurance shall be held by the trustee or the further security of the bondholders hereunder until it shall have been certified to the trustee by the President or a vice president and secretary or treasurer of the New York and Ontario Power Company that after the fire it has applied an equal sum of money to the reconstruction or repair of the part of the premises destroyed or injured or to the erection of other permanent improvements upon such mortgaged premises; whereupon from such insurance moneys held by the trustee there shall be paid to said New York and Ontario Power Company from time to time, an amount equal to the amount so certified to have been applied by it, after the fire to such reconstruction, repair, or erection.

Eighth. The said New York and Ontario Power Company shall and will from time to time during the continuance of this trust and mortgage, make, execute, and deliver, all such further instruments and conveyances as may be necessary to vest in said trustee and its successor and successors, the within described and all subsequently acquird property and rights of property to facilitate the execution of said trust.

Ninth. It is further covenanted and agreed that the personal property hereinbefore described and hereby conveyed or intended so to be, shall be real estate for all the purposes of this instrument and shall be held and taken to be fixtures and appurtenances of the mortgaged premises and as a part thereof, and are to be used and

sold therewith and not separate therefrom, except as herein expressly provided.

Tenth. The said New York and Ontario Power Company shall be permitted to alter, remove, or sell any buildings, fixtures, machinery or other appliances upon the mortgaged premises which can not be advantageously used in the judicious operation and management of the business of the said company, provided that no such sale or removal shall be made if such property to be so sold or removed exceeds in value the sum of five thousand ($5,000) dollars, unless the board of directors of said New York and Ontario Power Company shall by resolution certify that it is for the true interest of said company and its bondholders that such sale or removal should be made, and unless the written consent of the trustee shall also be obtained; and it is further provided that in case of a sale or removal of the property herein mentioned the value thereof or the money to be received therefrom shall be paid to the trustee herein, which money may upon request of the New York and Ontario Power Company be paid by the trustee upon receipt by it of a copy of a resolution of the board of directors of said company certified by its secretary or treasurer over its corporate seal to pay for other buildings, fixtures, machinery or other appliances in said resolution stated to be of equal value placed in or upon the mortgaged property; or, if the said New York and Ontario Power Company fails to make such request, then the said trustee may invest the same in bonds secured by this mortgage or in bonds, mortgages, or securities authorized by law for the investment of funds of savings banks in the State of New York, which bonds, mortgages, or securities shall be held for the further security of the bonds secured by this mortgage: but until default in the payment of the principal or interest of the bonds secured hereby, or some part thereof, the interest and income of said bonds, mortgages, and securities shall be paid to the New York and Ontario Power Company. The trustee may accept as sufficient evidence of any fact hereunder the sworn certificate of the president or vice president and secretary or treasurer of the company.

Eleventh. In case default shall be made in the payment of any interest on any of said bonds secured hereby, as and when such interest shall become due, and such default shall continue for six months, or in case default shall be made in the payment of the principal of any of the said bonds when the same shall mature or otherwise become payable, then and every such case, the trustee may, and upon the request of the holders of twenty-five per cent in interest of the bonds hereby secured and then outstanding, by an instrument or concurrent instruments in writing, signed by them or by their attorneys in fact duly authorized for that purpose, and upon being indemnified to its satisfaction, shall with or without entry, sell all the premises, estate, property, rights and franchises hereby conveyed, or so intended to be, at public auction at Waddington aforesaid, after giving notice of such sale as required by law, and also notice by publication in at least two newspapers published in said county of St. Lawrence at least once a week for six consecutive weeks next preceding such sale, and from time to time adjourn such sale or sales, and upon any sale or sales hereunder make and deliver to the purchaser and purchasers of the premises, estate, property, rights and

franchises so sold, a good and sufficient deed or deeds for the same, which sale shall be a perpetual bar, both in law and equity against the said New York and Ontario Power Company, and all persons and corporations lawfully claiming, or to claim by, through, or under it, and upon making of any such sale the principal of all the bonds hereby secured and then outstanding shall forthwith become due and payable, anything in said bond to the contrary notwithstanding, and upon the making of any such sale, the said trustee shall apply the proceeds thereof as follows, to wit:

1. To the payment of the costs and expenses of such sale or sales, including a reasonable compensation to such trustee, its agents, attorneys, and counsel, and all expenses, liabilities, and advances made and incurred by such trustee in managing and maintaining the property hereby conveyed, or intended to be, and all taxes and assessments superior to the lien of these presents.

2. To the payment of the whole amount of principal and interest which shall then be owing or unpaid upon the bonds secured hereby, without any preference or priority whatever, whether the said principal by the tenor of said bonds, be then due or yet to become due; and in case of the insufficiency of such proceeds to pay in full the whole amount of such principal and interest owing and unpaid upon the said bonds, then to the payment of such principal and interest pro rata, without preference or priority, but ratably, to the aggregate amount of such principal and accrued and unpaid interest.

3. To pay over the surplus, if any, to whomsoever may be lawfully entitled to receive the same.

Twelfth. It is further declared and agreed that the receipt of the trustee, who shall make the sale, hereinbefore authorized, shall be a sufficient discharge to the purchaser or purchasers at such sale for his or their purchase money, and such purchaser or purchasers, his or their heirs or assigns, or personal representatives, shall not, after paying such purchase money and receiving such receipt of the trustee therefor be obliged to see to the application of such purchase money upon or for the trust or purposes of these presents, or be in anywise answerable for any loss, misapplication, or non-application of such purchase money by the trustee.

Thirteenth. In case default shall be made in the payment of the principal or interest of any of said bonds when the same shall become due and payable, or in the observance or performance of any covenant or condition in said bonds or herein contained on the part of the party of the first part, and such default shall continue for six months, it shall be for the duty of, and it is hereby made obligatory upon the trustee upon the request in writing of the holders of twenty-five per cent in interest of said bonds hereby secured and then outstanding, and upon indemnification satisfactory, to proceed forthwith to enforce the rights of the said trustee and of the bondholders hereunder by sale or entry or both, according to such requisition, or by judicial proceedings for such purpose, as it being advised by counsel learned in the law, shall deem most expedient in the interest of the holders of the bonds secured hereby.

Fourteenth. The several remedies granted hereunder shall be cumulative and not exclusive one of the other, and shall be in addition to all other remedies to enforce the lien of such presents.

Fifteenth. In case of any default on its part, as aforesaid, the party of the first part shall not, and will not apply for or avail itself of any appraisement, valuation, stay, extension, or redemption laws, now existing, or which may hereafter be passed, in order to prevent or hinder the enforcement or foreclosure of this mortgage or the absolute sale of the premises hereby granted free from any right of redemption, or the final and absolute putting into possession thereof immediately after such sale the purchaser or purchasers thereof, but hereby waives the benefit of all such laws.

Sixteenth. Upon the filing of a bill in equity or other commencement of judicial proceedings to enforce the rights of the trustee of, or the bondholders under, these presents the said trustee shall be entitled, as a matter of right, to the appointment of a receiver or receivers of the property hereby mortgaged, and of the earnings, income, rents, issues, and profits thereof, pending such proceedings.

Seventeenth. Upon payment, when due, of all the principal and interest of all the bonds which shall have been issued hereunder and upon performance of all other covenants hereunder of the party of the first part, the trustee shall, upon the written request of the New York and Ontario Power Company forthwith enter satisfaction of this mortgage upon the records, and shall do, make, execute, and deliver such deeds, acts, instruments, or assurances as may be necessary to vest all the mortgaged premises and property in the said New York and Ontario Power Company, its successors and assigns, free and discharged from the lien of these presents.

Eighteenth. And it is covenanted and agreed that the trustee may resign and discharge itself of the trust hereby created by notice in writing to the New York and Ontario Power Company, to be given at least two months before such resignation shall take effect. And whenever notice of such resignation is so given or a vacancy in the office of trustee hereunder shall occur, a new trustee shall be appointed by the Supreme Court of the State of New York upon application at special term thereof in the judicial district in which the office of the New York and Ontario Power Company is located, upon the verified petition of the New York and Ontario Power Company, or upon like petition of twenty-five per cent of the bondholders; notice of such application, however, to be given by publication in two newspapers published in St. Lawrence County for at least two weeks immediately prior to the presentation of said petition to such special term. It shall be no part of the duty of the trustee to record this instrument as a mortgage or conveyance of real estate, or to file or record the same as a chattel mortgage, or to re-file or renew the same, or to procure any further assurance, or to do any other act for the continuance of the lien of this indenture, or to give notice of the existence of the lien thereof, or to extend or supplement the lien sought to be created hereby; nor shall it be any part of the duty of the trustee hereunder to effect insurance against fire or other damage on any portion of the property hereby mortgaged, or to renew any policies of fire or other insurance, or to keep itself informed or advised as to the payment of any taxes or assessments that may be imposed upon the property, real or personal, affected by this mortgage; or to require the

payment of such taxes or assessments, but the trustee may, in its discretion, at the expense of the New York and Ontario Power Company, do any or all of the matters or things in this article set forth, or require the same to be done.

Nineteenth. The trustee, the party hereto of the second part, for itself and its successor or successors, hereby accepts the trust and assumes the duties herein created and imposed upon it, but only upon the following terms and conditions, to wit:

(1) The recitals of fact herein contained and contained in the bonds hereby secured shall be taken as statements of the New York and Ontario Power Company and shall not be construed as made by the trustee.

(2) The trustee may select and employ in and about the execution of this trust, suitable agents and attorneys whose reasonable compensation shall be paid to the trustee by the New York and Ontario Power Company, or in default of such payment shall be a charge upon the hereby mortgaged premises and property and the proceeds thereof paramount to said bonds, and the trustee shall not be liable for any neglect, omission, or wrongdoing of such agents or attorneys, reasonable care being exercised in their selection, nor shall the trustee be otherwise answerable save for its own gross negligence or wilful default.

(3) The trustee shall have a first lien upon the mortgaged premises, and fund for its reasonable expenses, counsel fees and compensation incurred in and about the execution of the trust hereby created, and the exercises and performance of its power and duties hereunder.

(4) The trustee shall be under no obligation or duty to perform any act hereunder or to defend any suit in respect hereof unless reasonably indemnified. The trustee shall not be bound to recognize any person as a bondholder unless nor until his bonds are submitted to the trustee for inspection, if required, and his title satisfactorily established, if desputed.

(5) The exclusive right of action hereunder shall be vested in the trustee until refusal on its part so to act; and no bondholder shall be entitled to enforce these presents until after demand made upon the trustee, accompanied by tender of indemnity and a refusal by the trustee to act in accordance with said demand.

(6) The trustee shall be protected in acting upon any notice, request, consent, certificate, bond, or other paper or document believed by it to be genuine and to have been signed by the proper party.

Twentieth. By an order of the Gas and Electricity Commission of the State of New York bearing date the 2d day of May, 1907, the New York and Ontario Power Company was authorized to issue at this time only one hundred and fifty thousand ($150,000.00) dollars, of its bonds secured by a mortgage upon its property, therefore, in accordance with said order one hundred and fifty thousand ($150,000.00) dollars of said bonds are to be issued at this time under this mortgage.

In witness whereof, the said New York and Ontario Power Company has caused these presents to be signed in its corporate name by its president, and its corporate seal to be hereunto affixed and attested by its secretary, and the said Knickerbocker Trust Company

has also caused these presents to be signed in its corporate name by its president, and its corporate seal to be hereunto affixed and attested by its secretary, all the day and year first above written.

NEW YORK AND ONTARIO POWER COMPANY.
DAVID J. CRICHTON, JR., *President.*

[Seal of New York and Ontario Power Company.]

Sealed and delivered in the presence of—

Attest:
GARNET H. WELDRUM, *Secretary.*

KNICKERBOCKER TRUST CO.,
By B. L. ALLEN, *President.*

[Seal of Knickerbocker Trust Company.]

Attest:
F. G. KING, *Secretary.*

STATE OF NEW YORK,
St. Lawrence County, ss:

On the 31st day of August, in the year 1907, before me personally came David J. Crichton, jr., to me known, who being by me duly sworn, did depose and say that he resided in the city of Ogdensburg, that he is the president of the New York and Ontario Power Company, the corporation described in and which executed the above instrument, that he knew the seal of said corporation, that the seal affixed to the said instrument was such corporate seal, that it was so affixed by order of the board of directors of said corporation, and that he signed his name thereto by like order.

DANIEL M. SPRATT,
Notary Public, St. Lawrence County.

STATE OF NEW YORK,
County of New York, ss:

On this 16th day of September, in the year 1907, before me personally came B. L. Allen, to me known, who being by me duly sworn, did depose and say that he resided in East Orange, N. J.; that he is the 3d vice president of the Knickerbocker Trust Company, the corporation described in and which executed as trustee the above instrument; that he knew the seal of said corporation; that the said seal affixed to said instrument was such corporate seal; that it was so affixed by order of the board of directors of said corporation, and that he signed his name thereto by like order.

O. R. JUDD, [L. S.]
Notary Public, Kings County.

Ctf. filed in New York County.

STATE OF NEW YORK,
County of New York, ss:

I, Peter J. Dooling, clerk of the county of New York, and also clerk of the supreme court for the said county, the same being a court of record, do hereby certify that O. R. Judd, whose name is subscribed to the certificate of the proof or acknowledgment of the annexed instrument and thereon written, was, at the time of taking such proof or acknowledgment, a notary public in and for the county

of New York, dwelling in the said county, commissioned and sworn and duly authorized to take the same. And, further, that I am well acquainted with the handwriting of such notary, and verily believe that the signature to the said certificate of proof or acknowledgment is genuine.

In testimony whereof I have hereunto set my hand and affixed the seal of the said court and county the 16 day of Sept., 1907.

PETER J. DOOLING. [L. S.]

Received of the mortgagee named in the within instrument $750.00, being the amount of the tax imposed thereon and paid at the date of the recording thereof.

Dated Dec. 31, 1907.

CHAS. R. WALKER,
Recording Officer of St. Lawrence County.

Recorded December 31, 1907, 9 a. m. C. N. Reynolds, Dep. Clerk. Recorded in Liber 143B of Mortgages, at page 712.

STATE OF NEW YORK,
St. Lawrence County, Clerk's Office.

I hereby certify that I have compared the foregoing copy with the original record in this office, and that it is a true and correct transcript therefrom, and of the whole of said original.

In witness whereof, I have hereunto set my hand and seal of office, at Canton, this 27 day of Sept., 1918.

W. W. HALÉE, *Clerk.*

EXHIBIT A–13.

COPY OF ORDER OF PUBLIC SERVICE COMMISSION, 1909.

STATE OF NEW YORK.

Public Service Commission—Second District.

At a session of the Public Service Commission, second district, held at the capital, Albany, on the 14th day of January, 1909.

Present: Frank W. Stevens, chairman; Martin S. Decker, John B. Olmsted, commissioners.

In the matter of the petition of the New York & Ontario Power Co., under section 69 of the Public Service Commissions Law, for authority to issue $664,741 capital stock and $1,850,000 first mortgage bonds.

The New York & Ontario Power Co. having, on November 17, 1908, filed with this commission its petition, under section 69 of the Public Service Commissions Law, for authority to issue $664,741 common capital stock, and $1,850,000 first mortgage bonds of the denomination of $500, each payable August 1, 1937, and bearing interest at the rate of 5 per cent. per annum, to be secured by a first mortgage of said company for $2,000,000, dated August 1, 1907, $150,000 in bonds under which first mortgage are now outstanding; and hearings on said petition having been held by this

commission in the city of Albany on November 30, 1908, and January 12, 1909, George E. Van Kennen and J. Wesley Allison appearing for the petitioner; and it appearing that the proceeds of the stock and bonds hereinafter authorized to be issued by said company are to be used in the construction and equipment of its plant and for working capital; and this commission being of the opinion that the entire amount of capital stock asked for in the petition, should not be consented to at this time; NOW, upon the aforesaid petition and accompanying paper and evidence at the hearings, and after due deliberation, it is

Ordered, (1) That under section 69 of the Public Service Commissions Law, this commission hereby authorizes the New York & Ontario Power Co. to issue $600,000 common capital stock of said company of the par value of $100 a share, the use of the capital to be secured by the issue of said stock being, in the opinion of this commission, reasonably required for the said purposes of said corporation;

Ordered, (2) That under section 69, of the Public Service Commissions Law, this commission hereby authorizes the New York & Ontario Power Co. to issue $1,850,000 first mortgage bonds of said company of the denomination of $500, each, payable August 1, 1957, and bearing interest at the rate of 5 per cent per annum, and to be secured by a first mortgage of said company for $2,000,000 dated August 1, 1907, the use of the capital to be secured by the issue of said bonds being, in the opinion of this commission, reasonably required for the said purposes of said corporation;

Ordered, (3) That said stock shall be issued under this authorization for cash only at par value. That in case it is found desirable to issue said stock or any part thereof for property or services, further application shall be made to the commission for its authorization upon which application the value of the property or services shall be fully shown.

Ordered, (4) That sales of said stock shall be reported from time to time under oath to this commission stating all details of prior purchaser, amount sold and amount realized in full;

Ordered, (5). That said bonds shall be issued under this authorization for cash only. That they shall not be sold for a price which shall net the corporation after paying all fees, discounts, and charges whatsoever, less than 81 per cent of their par value and accrued interest any.

Ordered, (6) That reports under oath shall be made from time to time of all sales of bonds stating all details fully;

Ordered, (7) That a report under oath shall be made in any event at the expiration of each period of six months of what has been done under this authorization.

Ordered, (8) That the proceeds of said stock and bonds shall be used for the following purposes only, to wit, for the construction of the hydroelectric plant at Waddington, N. Y., as the same is set forth and described in the petition and evidence in this proceeding, equipping the same, and for working capital to be used in the operation thereof. If the proceeds of said stock and bonds are more than sufficient for said purposes, the excess shall not be used for any purpose until further ordered.

Ordered, (9) That detailed reports under oath showing the progress of the said work, contracts entered into, moneys expended, and other material details be made by said corporation at the expiration of each period of six months until the completion of said work, said details to cover a hydraulic development, foundations and substructures, hydraulic equipment, buildings and substructures, electric equipment, bridges and roadways, miscellaneaus construction, transmission lines, expense buying, inspecting, testing, and, upon completion of the work, contractor's profit, engineering contingencies, general administration cost, interest during construction, working capital, the preliminary expenses, and the mortgage tax.

By the commission.

(Signed) J. S. KENNEDY, *Secretary.*

STATE OF NEW YORK,

Office of the Public Service Commission, Second District, ss:

I have compared the preceding copy with the original order of this commission, dated the 14th day of January, 1909, in the matter of the petition of the New York and Ontario Power Company, under section 69 of the Public Service Commissions Law, for authority to issue $664,741 capital stock and $1,850,000 first mortgage bonds, on file in this office, and I do hereby certify the same to be a correct transcript therefrom and of the whole thereof.

Witness my hand and the seal of office of the Public Service Commission, second district, at the city of Albany, this seventh day of September, one thousand nine hundred and ten.

[SEAL.] J. KENNEDY, *Secretary.*

EXHIBIT A–14.

COPY OF ORDER OF PUBLIC SERVICE COMMISSION, 1913.

STATE OF NEW YORK.

Public Service Commission—Second District.

At a session of the Public Service Commission, second district, held at the capitol, Albany, on the 28th day of April, 1913.

Present: Martin S. Decker, James E. Sague, Curtis N. Douglas, Devoe P. Hodson, commissioners.

In the matter of the petition of the New York and Ontario Power Company, under section 69 of the Public Service Commissions Law, for authority to issue common capital stock and first mortgage bonds.

AMENDATORY ORDER.

Whereas on the 14th day of January, 1909, an order was entered by this commission authorizing the petitioner herein to issue $600,000 of common capital stock and $1,850,000 of first mortgage bonds; and

Whereas said petitioner now desires to have a greater amount of capital stock and a correspondingly lesser amount of first mortgage

bonds than was authorized in said order for the construction of a hydroelectric plant at Waddington, N. Y.; after due consideration, it is

Ordered, (1) That the New York and Ontario Power Company be, and it hereby is, authorized, pursuant to the provisions of section 69 of the Public Service Commissions Law, to issue—

(*a*) Upon the security of a certain indenture or deed of trust dated August 1, 1907, given to secure an issue of thirty-year bonds of the aggregate amount, par value, of $2,000,000, bearing interest at the rate of 5% per annum, payable semiannually, and the date of maturity thereof being August 1, 1937, its first mortgage bonds of the par value of $457,000; (*b*) its common capital stock of a par value of $2,000,000; total, $2,457,000.

Ordered, (2) That such bonds shall be sold at not less than 81% of their par value and accrued interest to yield net proceeds of $370,170.00, and that such stock shall be sold at not less than the par value thereof to give proceeds of $2,000,000; total proceeds, $2,370,-170.00.

Ordered, (3) That such bonds and stock of a total par value of $2,457,000, or the proceeds thereof, $2,370,170, shall be used for the purpose of constructing a hydroelectric plant at Waddington, N. Y., as the same is set forth and described in the petition in evidence in this proceeding, equipping the same, and for working capital to be used in the operation thereof; and the company shall so keep its books that they shall show the cost of the hydraulic development; foundations and substructures; hydraulic equipment; buildings and substructures; electric equipment; bridges and roadways; miscellaneous construction; transmission lines; purchasing, inspecting, and testing expense; contractor's profits; engineering and contingencies; general administration expense; interest during construction; work-ig capital; preliminary expenses; and mortgage tax, and such expenditures shall be kept in accordance with the Uniform System of Accounts for Electrical Corporations, and be charged upon the books of said company in accordance therewith; and that after the reasonable and necessary period of construction of said company shall have ceased no further expenditures shall be made from the proceeds of stock and bonds herein authorized except in so far as the same shall be properly chargeable to fixed capital as defined in the Uniform System of Accounts for Electrical Corporations adopted by this commission, making due allowance for all credits to fixed capital as required by said uniform system of accounts.

Ordered, (4) That if the proposed expenditures for the hydroelectric plant at Waddington, N. Y., shall cost less than the amount of proceeds herein allowed therefor, no portion of the said proceeds over the actual cost of said hydroelectric plant and attendant expenditures therefor shall be used for any purpose or purposes whatsoever without the further order of the commission.

Ordered, (5) That if the said bonds of a total par value of $457,000 herein authorized shall be sold at such price as will enable the company to realize more than a sum equivalent to 81% of their par value and accrued interest, no portion of the proceeds of such sale in excess of such sum shall be used for any purpose or purposes whatsoever without the further order of the commission.

Ordered, (6) That none of the said bonds herein authorized shall be hypothecated or pledged as collateral without the further order of the commission.

Ordered, (7) That the company shall for each three months' period ending March 31, June 30, September 30, and December 31, file not more than fifteen days from the end of such periods, respectively, a verified report showing—

(*a*) What, if any, stock and bonds have been sold or disposed of during such periods in accordance with the authority contained herein, and the date of such sale or disposition.

(*b*) To whom such stock and bonds were sold.

(*c*) What proceeds were realized from such sale.

(*d*) Any other terms or conditions of such sale.

Such reports shall continue to be filed until all of the said stock and bonds shall have been sold or disposed of in accordance with the authority contained herein.

Ordered, (8) That the company shall for each six months' period ending June 30 and December 31, file not more than thirty days from the end of such periods, respectively, a verified report showing the amount expended during such periods of the proceeds of the stock and bonds herein authorized for each of the purposes specified herein, and stating to what account or accounts such expenditures for each of the said purposes have been charged in the books of account of the company under the Uniform System of Accounts for Electrical Corporations prescribed by the commission, giving all the details of any credits to fixed capital in connection with such expenditures.

Ordered, (9) That in the opinion of the commission the money to be procured by the issue of said stock and bonds herein authorized is reasonably required for the purposes specified herein, and that such purposes are not in whole or in part reasonably chargeable to operating expenses or to income.

Ordered, (10) That the order of the commission entered the 14th day of January, 1909, be, and it hereby is, canceled, annulled, and abrogated, and that this order be, and it hereby is, substituted therefor.

By the commission:

[SEAL.] (Signed) J. S. KENNEDY, *Secretary.*

STATE OF NEW YORK,

Office of the Public Service Commission, Second District, ss:

I have compared the preceding copy with the original order of this commission dated April 28, 1913, in the matter of the petition of the New York and Ontario Power Company, under section 69 of the Public Service Commissions Law, for authority to issue common capital stock and first-mortgage bonds (amendatory order), on file in this office, and I do hereby certify the same to be a correct transcript therefrom and of the whole thereof.

Witness my hand and seal of the public service commission, second district, at the city of Albany this first day of May, one thousand nine hundred and thirteen.

[SEAL.] J. S. KENNEDY, *Secretary.*

EXHIBIT A–15.

COPY OF ORDER OF PUBLIC SERVICE COMMISSION, 1914.

STATE OF NEW YORK.

Public Service Commission—Second District.

At a session of the Public Service Commission, second district, held at the capitol, Albany, on the 26th day of March, 1914.

Present: Seymour Van Santvoord, chairman; Martin S. Decker, James E. Sague, Curtis N. Douglas, commissioners.

In the matter of the application of the New York and Ontario Power Company, under section 70 of the Public Service Commission Law for authority to issue its remaining unissued capital stock to the Upper St. Lawrence Power Company, Limited.

The New York and Ontario Power Company, a domestic electrical corporation, applied to the commission May 19, 1913, for an order authorizing it to sell and transfer to the Upper St. Lawrence Power Company, Limited, a Canadian corporation, its unsold capital stock to the amount of one million eight hundred thousand dollars ($1,800,000.00) out of two million dollars ($2,000,000.00) duly authorized by the commission by an amendatory order dated April 28, 1913. At a hearing held at the office of the commission in Albany, October 23, 1913, the New York and Ontario Power Company filed with the commission a tentative contract bearing date April 27, 1911, by and between the Hydro-Electric Power Commission of Ontario acting on its own behalf and with the approval of the lieutenant-governor-in-council, party of the first part, and the New York and Ontario Power Company, party of the second part, by the terms of which the New York and Ontario Power Company agreed to deliver to and the Hydro-Electric Power Commission of Ontario agreed to purchase and pay for the several quantities of electrical power on the terms and conditions set forth in said agreement in the ultimate aggregate amount of fifteen thousand (15,000) horsepower.

It appeared at said hearing that the New York and Ontario Power Company has at Waddington, St. Lawrence County, a potential development of about thirty-four thousand (34,000) horsepower. Upon the hearing the commission by Commissioner Decker required as a condition precedent to the determination of the application that a stipulation properly executed by the New York and Ontario Power Company be filed with the commission providing that in the event that such electrical power is developed at the company's plant at Waddington for the purpose of making delivery thereof to the Hydro-Electric Power Commission of Ontario to the extent of the quantity provided for in the agreement with the Hydro-Electric Power Commission of Ontario the New York and Ontario Power Company would and will upon reasonable notice to be prescribed by the commission furnish to applying customers in the State of New York in the vicinity of its plant and within reasonable distances therefrom, as required an equal amount of power to that agreed to be furnished to the Hydro-Electric Power Commission of Ontario according to the terms and conditions of said contract, and

that such service shall be subject to the powers and jurisdiction of the commission.

It further appeared at said hearing to the satisfaction of the commission that said unissued stock can be sold at par for cash to the Upper St. Lawrence Power Company, Limited, a Canadian corporation owning and operating an electrical generating plant near Morrisburg, Canada, on the St. Lawrence River opposite Waddington, and that such stock can not after reasonable efforts in that behalf be sold to the public or to any domestic electrical corporation.

And the New York and Ontario Power Company having executed and filed the stipulation required dated 31st December, 1913, duly acknowledged before Joseph M. Shepard, consul of the United States at Hamilton, Canada, 19th January, 1914; and it appearing to the satisfaction of the commission that the Upper St. Lawrence Power Company, Limited, is an operating electrical corporation duly organized under the laws of the Dominion of Canada, which if located and doing business in this State would be an electrical corporation as defined by sections 2 (13) and 70 of the public service commissions law, it is

Ordered, That the commission hereby consents that the remaining unissued capital stock, to wit, one million eight hundred thousand dollars ($1,800,000.00) of the New York & Ontario Power Company may be issued and delivered to the said Upper St. Lawrence Power Company, Limited, subject to all the conditions contained in the amendatory order of the commission herein dated April 28, 1913.

By the commission.

[SEAL.] (Signed) FRANK H. MOTT, *Secretary.*

STATE OF NEW YORK,
Public Service Commission, Second District, ss.:

I have compared the preceding copy with the original order of this commission, dated March 26, 1914, in the matter of the application of the New York and Ontario Power Company, under section 70 of the Public Service Commissions Law for authority to issue its remaining unissued capital stock to the Upper St. Lawrence Power Company, Limited, on file in this office, and I do hereby certify the same to be a correct transcript therefrom and of the whole thereof.

Witness my hand and the seal of the Public Service Commission, second district, at the city of Albany, this seventeenth day of September, one thousand nine hundred and eighteen.

[SEAL.] FRANCIS X. DISNEY, *Secretary.*

EXHIBIT A–16.

COPY OF SECRETARY OF WAR'S PERMIT FOR RIVER CROSSING.

THE WHITE HOUSE,
29 May, 1916.

The President of the United States, having fully considered the application of the New York and Ontario Power Company, a corporation organized under the laws of the State of New York, for the permission to suspend an electric transmission line over the

St. Lawrence River between Waddington, New York, and Ontario, Canada, involving a physical connection between the United States and a point outside the territorial jurisdiction of the United States, hereby gives authority for suspending and maintaining the said transmission line, subject to the conditions of the foregoing permit of the Secretary of War, and to the further condition that the consent hereby granted shall also be subject to any action by the Congress of the United States affirming, revoking, or modifying, in whole or in part, the conditions and terms upon which this consent is granted.

(Signed) WOODROW WILSON.

PERMIT.

Whereas by section 10 of an act of Congress approved March 3, 1899, entitled "An act making appropriations for the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes," it is provided that it shall not be lawful to build or commence the building of any wharf, pier, dolphin, boom, weir, breakwater, bulkhead, jetty, or other structures in any port, roadstead, haven, harbor, canal, navigable river, or other water of the United States outside established harbor lines, or where no harbor lines have been established, except on plans recommended by the Chief of Engineers and authorized by the Secretary of War; and it shall not be lawful to excavate or fill, or in any manner to alter or modify the course, location, condition, or capacity of any port, roadstead, haven, harbor, canal, lake, harbor of refuge, or inclosure within the limits of any breakwater, or of the channel of any navigable water of the United States unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of War prior to beginning the same;

And whereas application has been made to the Secretary of War by the New York & Ontario Power Company for authority to construct and maintain an electric transmission line over the St. Lawrence River, between Waddington, New York, and Ontario, Canada, for the conveyance of electric current from its generating plant in Waddington, New York, to consumers in Canada, the plans for which have been recommended by the Chief of Engineers:

Now, therefore, this is to certify that the Secretary of War hereby authorizes the said work of constructing and maintaining an electric transmission line over that portion of the St. Lawrence River on the American side of the international boundary at Waddington, New York, for the purpose of transmitting electric current from the generating plant of the New York & Ontario Power Company at that place across said river into Canada, at the location and as shown on said plans, which are attached hereto, upon the following conditions:

1. That it is to be understood that this authority does not give any property rights either in real estate or material, or any exclusive privileges; and that it does not authorize any injury to private property or invasion of private rights, or any infringement of Federal State, or local laws or regulations, nor does it obviate the necessity of obtaining State assent to the work authorized. It merely expresses

the assent of the Federal Government so far as concerns the public rights of navigation.

(See Cummings *v.* Chicago, 188 U. S., 410.)

2. That the work shall be subject to the supervision and approval of the Engineer officer of the United States Army in charge of the locality, who may temporarily suspend the work at any time if, in his judgment, the interests of navigation so require.

3. That if any pipe, wire, or cable is herein authorized, it shall be placed and maintained with a clearance not less than that shown by the profile on the plan attached hereto.

4. That so far as any material is dredged in the prosecution of the work herein authorized it shall be removed evenly, and no large refuse piles shall be left. It shall be deposited to the satisfaction of the said engineer officer and in accordance with his prior permission or instructions, either on shore above high water or at such dumping ground as may be designated by him, and where he may so require, within or behind a good and substantial bulkhead or bulkheads, such as will prevent escape of the material into the waterway; and so far as the pipe, wire, or cable is laid in a trench, the formation or permanent ridges across the bed of the waterway shall be avoided and the back filling shall be so done as not to increase the cost of future dredging for navigation. If the material is to be deposited in the harbor of New York or in its adjacent or tributary waters, or in Long Island Sound, a permit therefore must be previously obtained from the supervisor of New York Harbor, Army Building, New York City.

5. That there shall be no unreasonable interference with navigation by the work herein authorized.

6. That if inspections or any other operations by the United States are necessary in the interests of navigation, all expenses connected therewith shall be borne by the permittee.

7. That the permittee assumes all responsibility for damages to the work or structure herein authorized and for damage caused by it or by his work in connection therewith to passing vessels or other craft, and that he shall not attempt in any way to prevent free use by the public of the area at or adjacent to the work or structure.

8. That if future operations by the United States require an alteration in the position of the structure or work herein authorized, or if, in the opinion of the Secretary of War, it shall cause unreasonable obstruction to the free navigation of said water, the permittee will be required, upon due notice from the Secretary of War, to remove or alter the structural work or obstruction caused thereby without expense to the United States so as to render navigation reasonably free, easy, and unobstructed; and if, upon the expiration or revocation of this permit, the structure, fill, excavation, or other modification of the watercourse hereby authorized shall not be completed, the permittee, at his own expense, and to such extent and in such time and manner as the Secretary of War may require, shall remove all or any portion of the uncompleted structure or fill and restore to its former condition the navigable capacity of the watercourse. No claim shall be made against the United States on account of any such removal or alteration.

9. That there shall be installed and maintained on the work, by and at the expense of the permittee, such lights and signals as may be prescribed by the Bureau of Lighthouses, Department of Commerce.

10. That the permittee shall notify the said engineer officer at what time the work will be commenced and as far in advance of the time of commencement as the said engineer officer may specify, and shall also notify him promptly, in writing, of the commencement of work, suspension of work, if for a period of more than one week, resumption of work, and its completion.

11. That if the structure or work herein authorized is not completed and written notice of completion is not filed with the aforesaid engineer officer on or before the 31st day of December, 1916, this authorization, if not previously revoked or specifically extended, shall cease and be null and void.

12. That this authorization shall be null and void unless the consent of the President of the United States to the work herein authorized is obtained prior to the commencement of operation.

13. That this permission shall be operative only on condition that the permittee shall have obtained in the Dominion of Canada a concession covering the construction, maintenance, and operation of the said transmission line so far as it lies within the Dominion of Canada.

Witness my hand this 15th day of May, 1916.

NEWTON D. BAKER,
Secretary of War.

EXHIBIT A–25.

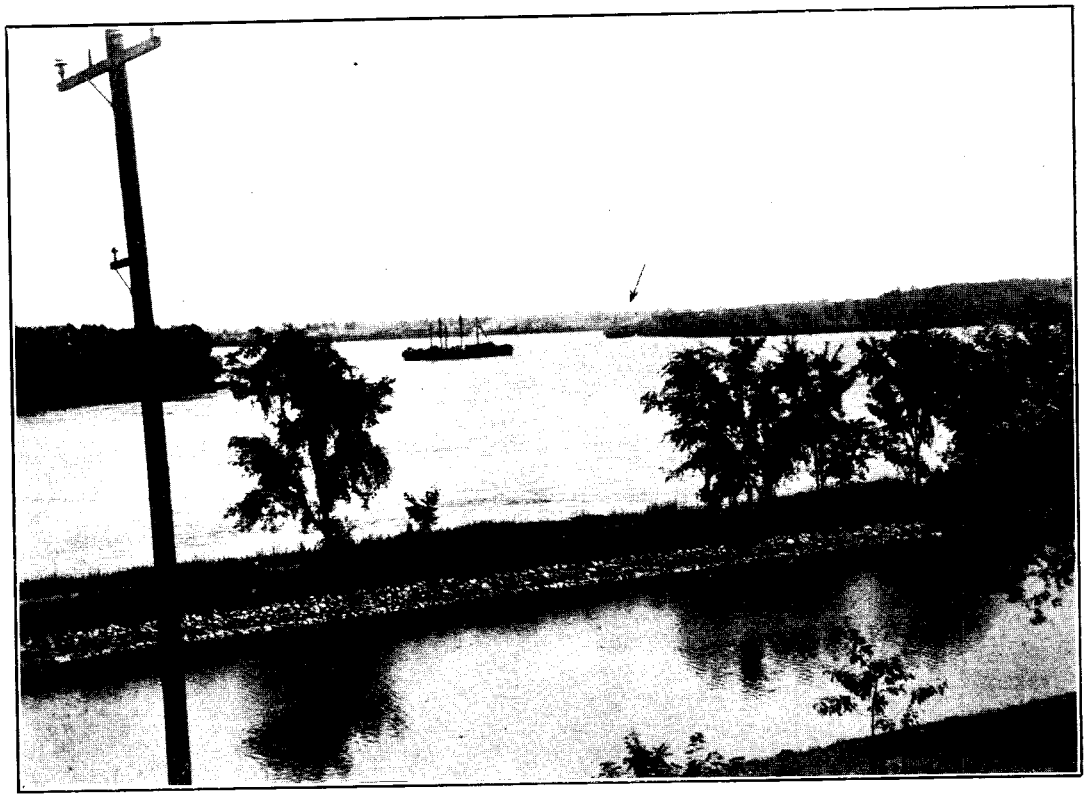
TABLE SHOWING MONTHLY MEAN DISCHARGE OF ST. LAWRENCE RIVER, 1860–1917.

New York and Ontario Power Company, B. B. Tucker, engineer, Morrisburg, Ont.; R. S. Lea, consulting engineer, Montreal, P. Q.

(Monthly means in hundreds of second-feet.)

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Mean.
1860	2469	2423	2524	2650	2735	2864	2923	2789	2696	2652	2671	2666	2672
1	2438	2390	2585	2749	3011	3098	3043	2984	2871	2921	2923	2873	2824
2	2583	2417	2624	2951	3181	3116	3140	3029	2873	2747	2663	2640	2830
3	2509	2447	2563	2843	2974	3011	2912	2801	2712	2668	2627	2629	2725
4	2414	2309	2423	2657	2923	2995	2919	2809	2684	2632	2625	2648	2670
5	2577	2532	2670	2803	2875	2885	2849	2705	2565	2514	2456	2422	2654
6	2231	2166	2256	2459	2502	2479	2691	2668	2648	2617	2563	2544	2485
7	2332	2256	2500	2817	2017	2084	2993	2843	2724	2574	2406	2239	2649
8	2034	1993	2131	2361	2525	2622	2594	2528	2484	2353	2320	2358	2359
9	2180	2139	2273	2489	2671	2721	2797	2811	2768	2747	2655	2694	2579
1870	2616	2571	2675	3014	3198	3119	3041	2960	2795	2717	2586	2528	2818
1	2356	2251	2387	2627	2755	2742	2705	2604	2525	2412	2322	2254	2495
2	2080	1973	2020	2214	2267	2340	2353	2318	2254	2219	2208	2133	2198
3	1992	1947	2051	2573	2728	2709	2701	2636	2540	2437	2408	2450	2431
4	2419	2431	2651	2740	2768	2789	2777	2724	2576	2484	2358	2283	2583
5	2080	1947	2081	2345	2432	2468	2475	2444	2397	2336	2294	2254	2296
6	2199	2267	2478	2813	2987	3039	3056	2945	2799	2719	2636	2594	2711
7	2320	2195	2316	2573	2620	2597	2606	2544	2446	2351	2331	2360	2438
8	2234	2209	2351	2613	2724	2721	2712	2694	2634	2574	2546	2732	2570
9	2517	2368	2431	2629	2682	2689	2652	2571	2475	2378	2292	2298	2499
1880	2201	2191	2352	2495	2560	2615	2617	2519	2434	2344	2336	2298	2414
1	2081	2018	2237	2425	2496	2546	2563	2489	2364	2316	2316	2316	2347
2	2286	2253	2474	2657	2732	2854	2851	2773	2684	2567	2471	2406	2584
3	2222	2159	2234	2532	2680	2845	2971	2929	2813	2709	2657	2625	2615
4	2395	2456	2605	2947	3013	2989	2939	2883	2779	2682	2567	2533	2732
5	2400	2333	2177	2320	2745	2833	2867	2830	2777	2732	2745	2785	2629
6	2692	2716	2734	2933	3122	3073	2977	2871	2785	2717	2615	2594	2819
7	2530	2711	2720	2846	3015	3006	2939	2816	2673	2583	2502	2441	2732
8	2234	2011	2171	2491	2553	2563	2576	2553	2463	2384	2368	2366	2394
9	2387	2199	2315	2531	2571	2643	2686	2629	2500	2402	2314	2439	2468

Exhibit A–35.



BARGE ON SHOAL CALLED "GRAVEYARD OF THE ST. LAWRENCE," WADDINGTON, N. Y.

448–1

Table showing monthly mean discharge of St. Lawrence River, 1860–1917—Con.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Mean.
1890	2520	2558	2661	2720	2854	3006	2965	2803	2721	2645	2663	2615	2728
1	2498	2491	2635	2803	2787	2689	2625	2523	2426	2285	2153	2146	2505
2	2111	1975	1986	2277	2331	2454	2571	2553	2507	2408	2349	2320	2320
3	2008	2210	2320	2477	2763	2816	2753	2629	2567	2448	2358	2324	2455
4	2291	2056	2426	2499	2560	2682	2636	2502	2388	2334	2261	2184	2402
5	2052	1864	1926	2224	2276	2250	2186	2131	2058	1987	1934	1940	2069
6	1882	1993	2150	2311	2371	2353	2294	2263	2157	2107	2052	2052	2165
7	1945	1886	2008	2254	2364	2410	2410	2408	2298	2159	2146	2159	2204
8	2099	2196	2336	2427	2482	2496	2432	2356	2267	2212	2223	2225	2313
9	2130	2077	2206	2389	2352	2482	2448	2346	2236	2148	2120	2107	2262
1900	2060	2076	2061	2400	2496	2477	2456	2395	2302	2214	2177	2241	2280
1	2129	2073	2043	2349	2477	2497	2439	2368	2298	2199	2118	2135	2260
2	2084	1854	2213	2360	2380	2397	2491	2523	2422	2368	2287	2252	2303
3	2168	2170	2378	2572	2493	2468	2499	2449	2390	2316	2240	2190	2361
4	1977	2014	2166	2549	2723	2780	2785	2730	2643	2560	2451	2335	2476
5	2040	2250	2200	2363	2428	2499	2585	2567	2534	2470	2390	2350	2390
6	2408	2317	2298	2397	2455	2461	2495	2430	2335	2266	2287	2320	2372
7	2195	2271	2331	2542	2607	2613	2615	2567	2480	2476	2444	2444	2465
8	2303	2290	2476	2764	2910	2947	2884	2798	2620	2468	2358	2272	2591
9	2114	2032	2213	2397	2624	2655	2624	2549	2434	2341	2238	2210	2369
1910	2047	1944	2250	2354	2463	2472	2436	2386	2312	2245	2198	2146	2271
1	1992	1946	2015	2208	2291	2303	2278	2206	2144	2092	2068	2094	2136
2	1969	1842	1922	2230	2549	2664	2591	2514	2455	2411	2392	2398	2328
3	2459	2418	2479	2735	2802	2813	2772	2657	2532	2436	2388	2356	2571
4	2232	2112	2137	2520	2578	2569	2527	2444	2394	2289	2218	2134	2346
5	2085	1976	2187	2174	2198	2192	2194	2255	2259	2202	2156	2124	2167
6	2147	2125	2096	2435	2618	2778	2794	2668	2521	2388	2301	2240	2426
7	2109	2213	2181	2408	2499	2582	2688	2664	2536	2529	2521	2470	2450
Mean	2239	2198	2317	2539	2653	2687	2679	2610	2517	2440	2384	2465	2469

Based on information supplied by the United States Lake Survey and independent studies and investigations of summer and winter conditions on the St. Lawrence.

EXHIBIT A–36.

GRANT OF THE STATE OF NEW YORK TO JOHN TAYLER.

The People of the State of New York, By the Grace of God Free and Independent:

To all to whom these Presents shall come, Greeting:

Know Ye that we have given, granted and confirmed, and by these presents, do give, grant and confirm, unto John Tayler.

In consequence of a location made by him in our Surveyor General's Office as by his certificate thereof, bearing date the 15th day of November 1787, and filed in our Secretary's Office will appear.

All that certain tract or parcel of land, to be distinguished by the fifteenth lot in the township of Madrid situate in the County of Montgomery on the south east side of the river St. Lawrence. Beginning on the bank of the said river at the most westerly corner of a tract of Five hundred acres of land also located by the said John Tayler and distinguished in the certificate of the location thereof by the Fourteenth lot and running from the said place of beginning south twenty eight degrees east seventy two chains. Then south sixty two degrees west seventy chains, then north twenty eight degrees west sixty eight chains to the said river and then down along the same to the place of beginning. Containing Five Hundred acres.

Together with all and singular the rights, hereditaments and appurtenances to the same belonging, or in any wise appertaining, excepting and reserving to ourselves all gold and silver mines, and five acres of every hundred acres of the said tract of land for highways. To have and to hold the above described and granted premises, unto the said John Tayler his heirs and assigns, as a good and indefeasible estate of inheritance forever; on condition nevertheless, that within the term of seven years, to be computed from the first day of January next ensuing the date hereof, there shall be one actual settlement made on the said tract of land hereby granted, otherwise these our letters patent and the estate hereby granted, shall cease, determine, and become void.

In Testimony Whereof, we have caused these our letters to be made patent, and the great seal of our said state to be hereunto affixed. Witness our trusty and well beloved George Clinton, Esquire, Governor of our said state, General and Commander in Chief of all the militia, and Admiral of the navy of the same, at our city of New York, this Fourth day of June in the year of our Lord one thousand seven hundred and eighty eight and in the twelfth year of our independence.

GEO. CLINTON.

Approved of by the Commissioners of the Land Office, and passed by the Secretary's Office the 4th day of June 1788.

ROBT. HARPUR, *D. Secry.*

Examined and compared with the original by me.
Between the 6th & 7th lines, the word "office" being interlined.

ROBT. HARPUR, *D. Secry.*

EXR.
Book of Patents No. 20 page 325.
Liber 1 of Certified Copies page 233.

STATE OF NEW YORK,
St. Lawrence County Clerk's Office:

I hereby certify that I have compared the foregoing copy with the original record in this office, and that it is a true and correct transcript therefrom, and of the whole of said original.

In witness whereof, I have hereunto set my hand and seal of office, at Canton, this 30th day of Sept., 1918.

[SEAL.] W. W. HALÉE, *Clerk.*

EXHIBIT A–37.

GRANT OF THE STATE OF NEW YORK TO JOHN TAYLER.

The People of the State of New York, by the Grace of God Free and Independent:

To all to whom these Presents shall come, Greeting:

Know Ye that we have given, granted and confirmed, and by these presents, do give, grant and confirm, unto John Tayler.

In consequence of a location made by him in our Surveyor General's Office as by his certificate thereof bearing date the 15th day of November 1787 and filed in our Secretary's Office will appear.

All that certain tract or parcel of land to be distinguished by the Sixteenth lot in the Township of Madrid situate in the County of Montgomery on the south east side of the river St. Lawrence.

Beginning on the bank of the said river at the most westerly corner of a tract of five hundred acres of land also located by the said John Tayler and distinguished in the certificate of the location thereof by the fifteenth lot and running from the said place of beginning south twenty eight degrees east sixty chains, then south sixty two degrees west seventy chains, then north twenty eight degrees west ninety chains to the said river and then down along the same to the place of beginning, Containing Five hundred acres.

Together with all and singular the rights, hereditaments and appurtenances to the same belonging, or in any wise appertaining, excepting and reserving to ourselves all gold and silver mines, and five acres of every hundred acres of the said tract of land for highways. To have and to hold the above described and granted premises, unto the said John Tayler his heirs and assigns, as a good and indefeasible estate of inheritance forever; on condition nevertheless, that within the term of seven years, to be computed from the first day of January next ensuing the date hereof, there shall be one actual settlement made on the said tract of land hereby granted, otherwise these our letters patent and the estate hereby granted, shall cease, determine, and become void.

In Testimony Whereof, we have caused these our letters to be made patent, and the great seal of our said state to be hereunto affixed. Witness our trusty and well beloved George Clinton, Esquire Gouvernor of our said state, General and Commander in Chief of all the militia, and Admiral of the navy of the same, at our city of New York this Fourth day of June in the year of our Lord one thousand seven hundred and eighty eight and in the twelfth year of our independence.

GEO. CLINTON.

Approved of by the Commissioners of the Land Office, and passed the Secretary's Office the 4th day of June 1788.

ROBT. HARPUR, *D. Secry.*

Examined and compared with the original by me.

ROBT. HARPUR, *D. Secry.*

EXT.

Book of Patents No. 20 page 326.
Liber 1 of Certified Copies page 234.

STATE OF NEW YORK,
St. Lawrence County Clerk's Office:

I hereby certify that I have compared the foregoing copy with the original record in this office, and that it is a true and correct transcript therefrom, and of the whole of said original.

In witness whereof, I have hereunto set my hand and seal of office, at Canton, this 30th day of Sept., 1918.

[SEAL.] W. W. HALÉE, *Clerk.*

EXHIBIT A–38.

GRANT OF THE STATE OF NEW YORK TO JOHN TAYLER.

The People of the State of New York, By the Grace of God Free and Independent:

To all to whom these Presents shall come, Greeting:

Know Ye that we have given, granted and confirmed, and by these presents, do give, grant and confirm, unto John Tayler.

In consequence of a location made by him in our Surveyor General's Office as by his certificate thereof bearing date the 15th day of November 1787, and filed in our Secretary's Office will appear.

All that certain tract or parcel of land to be distinguished by the Seventeenth lot in the township of Madrid situate in the County of Montgomery on the south east side of the river St. Lawrence.

Beginning on the bank of the said river at the most westerly corner of a tract of Five Hundred acres of Land also located by the said John Tayler, and distinguished in the certificate of the location thereof by the sixteenth lot and running from the said place of beginning south twenty eight degrees east sixty chains, then south sixty two degrees west seventy chains, then north twenty eight degrees west one hundred and two chains to the place of beginning, Containing Five Hundred acres.

Together with all and singular the rights, hereditaments and appurtenances to the same belonging, or in any wise appertaining, excepting and reserving to ourselves all gold and silver mines, and five acres of every hundred acres of the said tract of land for highways. To have and to hold the above described and granted premises, unto the said John Tayler his heirs and assigns, as a good and indefeasible estate of inheritance forever; on condition nevertheless, that within the term of seven years, to be computed from the first day of January next ensuing the date hereof, there shall be one actual settlement made on the said tract of land hereby granted, otherwise these our letters patent and the estate hereby granted, shall cease, determine, and become void.

In Testimony Whereof, we have caused these our letters to be made patent, and the great seal of our said state to be hereunto affixed. Witness our trusty and well beloved George Clinton, Esquire, Governor of our said state, General and Commander in Chief of all the militia, and Admiral of the navy of the same, at our city of New York this Fourth day of June in the year of our Lord one thousand seven hundred and eighty eight and in the twelfth year of our independence.

GEO. CLINTON.

Approved of by the Commissioners of the Land Office, and passed the Secretary's Office the 4th day of June, 1788.

Exd. ROBT. HARPUR, *D. Secry.*

Examined and compared with the original by me.

ROBT. HARPUR, *D. Secry.*

Book of Patents No. 20 page 327.
Liber 1 of Certified Copies page 235.

STATE OF NEW YORK,
St. Lawrence County Clerk's Office:

I hereby certify that I have compared the foregoing copy with the original record in this office, and that it is a true and correct transcript therefrom, and of the whole of said original.

In witness whereof, I have hereunto set my hand and seal of office, at Canton, this 30th day of Sept., 1918.

[SEAL.] W. W. HALÉE, *Clerk.*

EXHIBIT A–39.

GRANT OF THE STATE OF NEW YORK TO ALEXANDER MACOMB,

The People of the State of New York, By the Grace of God Free and Independent:

To all to whom these Present shall come, Greeting:

Know Ye that we have given, granted and confirmed, and by these presents, do give, grant and confirm, unto Alexander Macomb, All that certain tract or parcel of land, situate, lying and being in the County of Montgomery on the southeast side of the river St. Lawrence and distinguished on a map filed in the Secretary's Office by Lot Number Seven in the Township of Madrid.

Beginning at the most southerly corner of lot number eight and running thence south sixty two degrees west sixty three chains; thence north twenty eight degrees west one hundred and ninety chains to the said River St. Lawrence; then down along the same to the seventeenth lot of five hundred acres of land located by John Taylor then along the same south twenty eight degrees east one hundred and two chains and north sixty two degrees east fifty three chains to the said lot number eight and then along the same south twenty-eight degrees east ninety two chains to the place of beginning, Containing six hundred and forty acres.

Together with all and singular the rights, hereditament and appurtenances to the same belonging, or in any wise appertaining, excepting and reserving to ourselves all gold and silver mines, and five acres of every hundred acres of the said tract of land for highway. To Have and to Hold the above described and granted premises, unto the said Alexander Macomb, his heirs and assigns, as a good and indefeasible estate of inheritance forever; on condition nevertheless, that within the term of seven years, to be computed from the first day of January next ensuing the date hereof, there shall be one actual settlement made on the said tract of land hereby granted, for every six hundred and forty acres thereof, otherwise these our letters patent and the estate hereby granted, shall cease, determine, and become void.

In Testimony Whereof, we have caused these our letters to be made patent, and the great seal of our said state to be hereunto affixed. Witness our trusty and well beloved George Clinton, Esquire, Governor of our said state, General and Commander in Chief of all the militia, and Admiral of the navy of the same, at our city of New York, this Seventeenth day of December, in the year of our Lord one thousand

seven hundred and eighty seven, and in the twelfth year of our independence.

GEO. CLINTON.

Approved of by the Commissioners of the Land Office and passed the Secretary's Office the 17th day of December 1787.

LEWIS A. SCOTT, *Secretary.*

Examined and compared with the original by me.

LEWIS A. SCOTT, *Secretary.*

Exd.
Book of Patents No. 20 page 96.
Book 1 of Certified Copies page 33.

STATE OF NEW YORK,
St. Lawrence County Clerk's Office:

I hereby certify that I have compared the foregoing copy with the original record in this office, and that it is a true and correct transcript therefrom, and of the whole of said original.

In witness whereof, I have hereunto set my hand and seal of office, at Canton, this 28th day of Sept., 1918.

[SEAL.] W. W. HALÉE, *Clerk.*

EXHIBIT A–40.

GRANT OF THE STATE OF NEW YORK TO JEREMIAH VAN RENSSELAER.

The People of the State of New York to Jeremiah Van Rensselaer.

Letters patent, Dated 4th June 1788, Recorded in the Office of the Secretary of State in Liber No. 20 of Patents at page 234, &c. Certified Copy of the Record in Liber No. 1 of the Certified Copies of Records deposited in St. Lawrence County Clerk's Office pursuant to Chapter 26 of the Laws of 1836, at page 224, &c., in the words and figures following, that is to say;

The People of the State of New York, by the grace of God free and independent:

To all to whom these presents shall come, greeting:

Know Ye that we have given, granted and confirmed and by these presents do give, grant and confirm unto Jeremiah Van Rensselaer, in consequence of a location made by him in our Surveyor General's Office, as to his Certificate thereof, bearing date the 5th. day of May, 1788 and filed in our Secretary's Office will appear:

All that certain tract or parcel of land situate in the County of Montgomery on the southeast side of the River St. Lawrence, consisting of Lot No. One, and Lot No. Two, Lot Number Three, Lot Number Four, Lot Number Five and Lot Number Six in the township of Madrid, as designated on a map thereof filed in our Secretary's Office.

Beginning at the most westerly corner of Lot Number Seven in the said township on the shore of the said River St. Lawrence, and running thence south twenty-eight degrees east, about one hundred and ten chains to the most northerly corner of Lot Number Fifteen in the said Township; thence south sixty-two degrees west, four hundred chains; then North twenty-eight degrees west seventy chains to the

said River St. Lawrence, and then down along the same to the place of beginning, Containing three thousand eight hundred and forty acres.

Together with all and singular the rights, hereditaments and appurtenances to the same belonging or in any wise appertaining, excepting and reserving to ourselves all gold and silver mines, and five acres of every hundred acres of said tract of land for highways.

To have and to hold the above described and granted premises, unto the said Jeremiah Van Rensselaer, his heirs and assigns, as a good and indefeasible estate of inheritance forever; on condition nevertheless, that within the term of seven years, to be computed from the first day of January next ensuing the date hereof, there shall be one actual settlement made on the said tract of land hereby granted, for every six hundred acres thereof, otherwise these our letters patent and the estate hereby granted shall cease, determine and become void.

In witness whereof, we have caused these our letters to be made patent, and the great seal of our said State to be hereunto affixed.

Witness our trusty and well beloved George Clinton, Esq., Governor of our said State, General and Commander in Chief of all the Militia and Admiral of the Navy of the same, at our city of New York, this fourth day of June, in the year of our Lord one thousand seven hundred and eighty eight, and in the twelfth year of our independence.

GEORGE CLINTON.

Approved of by the Commissioner of the Land Office and Passed the Secretary's Office the 4th day of June 1788.

ROBERT HARPER, *D. Secretary.*

EXHIBIT A–41.

GRANT OF THE STATE OF NEW YORK TO DANIEL McCORMICK.

The People of the State of New York, By the Grace of God Free and Independent:

To all to whom these Presents shall come, Greeting:

Know Ye that we have given, granted and confirmed, and by these presents, do give, grant and confirm, unto Daniel McCormick,

All that certain Island known and destinguished by the name of Isle au Rapide Plat situate in the river St. Lawrence, opposite the Village of Hamilton in the town of Madrid in the County of St. Lawrence, Containing Seven hundred and sixty three acres.

Together with all and singular the rights, hereditaments and appurtenances to the same belonging, or in any wise appertaining, excepting and reserving to ourselves all gold and silver mines. To have and to hold the above described and granted premises, unto the said Daniel McCormick his heirs and assigns, as a good and indefeasible estate of inheritance forever.

In Testimony Whereof, we have caused these our letters to be made patent, and the great seal of our said state to be hereunto affixed. Witness our trusty and well beloved Daniel D. Tompkins, Esquire, Governor of our said state, General and Commander in Chief of all the militia, and Admiral of the navy of the same, at

our city of Albany the sixth day of August in the year of our Lord one thousand eight hundred and fourteen and in the thirty ninth year of our independence.

ARCH. CAMPBELL, *Dep. Secretary.*

Passed the Secretary's Office the 7th day of March, 1815.

I have examined the preceding Letters Patent and do certify that the same are conformable to the order and proceedings of the Commissioners of the Land Office and in due form of Law.

DANIEL D. TOMPKINS.

M. V. BUREN, *Atty. Genl.*

Examined and compared with the original. The words "Island known & dis.," written on an erasure.

ARCH. CAMPBELL, *Dep. Secretary.*

Book of Patents No. 26, page 410.
Exd.
Liber 1 of Certified Copies page 259.

STATE OF NEW YORK,
St. Lawrence County Clerk's Office:

I hereby certify that I have compared the foregoing copy with the original record in this office, and that it is a true and correct transcript therefrom, and of the whole of said original.

In witness whereof, I have hereunto set my hand and seal of office, at Canton, this 30th day of Sept., 1918.

W. W. HALÉE, *Clerk.*

[SEAL.]

EXHIBIT N. Y.–4.

REPORT OF COMMITTEE ON JUDICIARY TO NEW YORK STATE SENATE ON PETITION OF DAVID A. OGDEN.

(From the New York Senate Journal, 49th Session, 1826, page 373.)

MARCH 16, 1826—Thursday, 11 o'clock a. m.

The Senate met pursuant to adjournment.

Present: His honor the lieutenant governor, president and a quorum of the Senate.

Mr. Viele, from the committee on the judiciary, to whom was referred the petition of David A. Ogden, of the county of St. Lawrence, reported as follows, to wit:

That the prayer of the petition is, in effect, that the State will release to the petitioner, and to those who have purchased under him, all the title which the State may have to that part of the bed or soil of the River St. Lawrence which lies between an island in the said river called "Isle au Rapid Plat" and the continent or main shore.

It appears from the representations of the petitioner that he is now the owner of the above-mentioned island and of the lands opposite thereto, so that he is the proprietor of the shores on both sides of the branch of the river which divides the island from the continent. That in 1809 the petitioner and his associates were authorized by an act of the legislature to erect a dam from the main shore to the island and to construct locks and exact certain tolls for the

passage of boats through the same. They were also authorized to take from the dam the water which might be requisite for mills or other works. The rights granted by the above-mentioned act were limited to seventy-five years, eighteen whereof have nearly expired.

The petitioner further represents that a permanent dam with a lock has been erected across the said river by the petitioner, and that various buildings for manufacturing purposes have been erected and are now erecting on the bed of that part of the St. Lawrence which by the operation of the dam has been rendered occasionally dry.

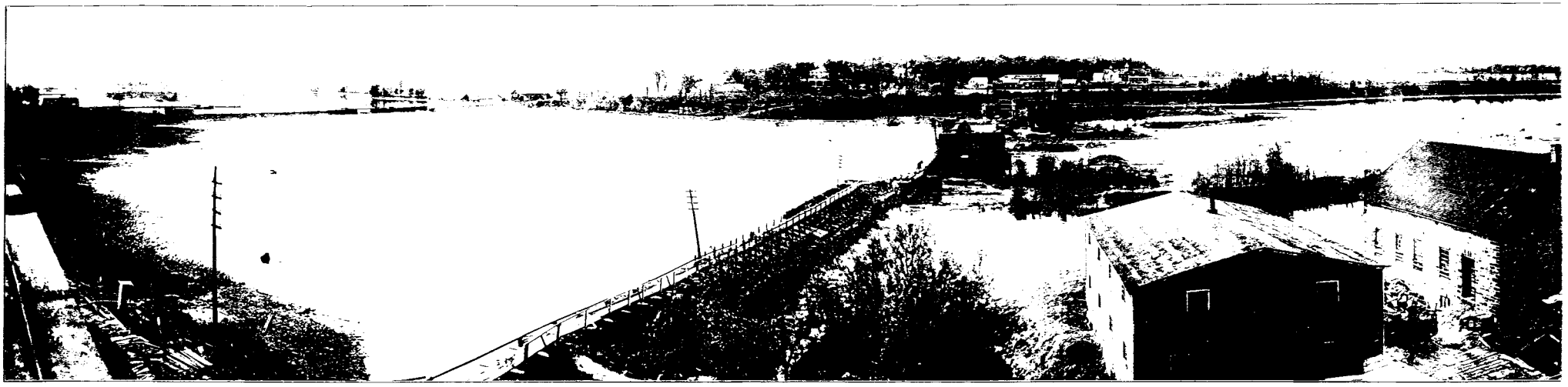
The petitioner further represents, and it is testified to by a witness whose deposition has been submitted to the committee, that the branch of the river which is between the island and the main was innavigable in its natural state for boats, though rafts went down occasionally at much risk, and generally with loss. The same witness further states in his deposition that below the dam there is a space which, when the river is low, is not covered with water; but that during the summer season, when the river is high, its bed is covered with water to the height of about eighteen inches.

The petitioner claims to have title, in virtue of his being the owner of both shores, to the bed or soil of the river which lies between the island and the main, and represents that he has been advised by counsel that his claim is well founded. But apprehending that doubts may be entertained on this subject and that any uncertainty as to his title may affect the value of the manufactories which have been erected and are erecting below the dam, the petitioner is desirous to have his title confirmed by a relinquishment of all right which the State may have by an act of the legislature.

The committee do not feel themselves called upon to give any opinion as to the petitioner's claim of title. They conceive it only requisite for them to state the facts which have been presented to the committee, that the senate may judge how far it may be proper to grant the prayer of the petition. It appears to the committee that if, as they believe, a reservation of that part of the bed of the river which lies between the Isle au Rapid Plat and the lands of the petitioner on the main shore, could be of no advantage or use to the State, the prayer of the petition may be granted; the more especially as such a grant will tend to encourage many very useful enterprises and manufacturing establishments, which will be benefited by a relinquishment of any title which the State may have to the land in question.

The committee have therefore prepared a bill by which the State will relinquish any claim to the lands under the waters of the strait which divides the island from the mainland, with a reservation to the State to take from it any waters which may be required for canals or internal improvements, and reserving to the State also a right to regulate the tolls at the lock built by the petitioner after the before-mentioned term has expired, it having been represented to the committee that the lock is on the lands of the petitioner and does not occupy any part of what was the natural bed of the river.

The committee have directed their chairman to present the bill they have prepared to the senate.



PANORAMA OF LITTLE RIVER, OLD DAMS AND SITE OF PROJECT.

PANORAMA OF LITTLE RIVER OLD DAMS AND SITE OF PROJECT.