

INTERNATIONAL JOINT COMMISSION

In re Levels of Rainy Lake and Other Upper
Waters of the Lake of the Woods Watershed
and Their Future Regulation and Control.

HEARING AT

OTTAWA, CANADA,
October 3-4, 1932.

GEORGE W. REIK - - WASHINGTON
GEORGE SIMPSON - - - OTTAWA
OFFICIAL REPORTERS

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Ottawa, Ontario,
October 4, 1932.

The Commission met in their offices at Ottawa on the
above date at 10 o'clock a.m., Mr. Charles A. Magrath
presiding.

PRESENT:

Charles A. Magrath, John H. Bartlett,
Sir William H. Hearst, K.C.M.G.,
P.J. McCumber, George W. Kyte, K.C.
and A.O. Stanley; also Secretary
Lawrence J. Burpee and Acting
Secretary George W. Reik.

APPEARANCES.

Major P.C. Bullard, Corps of Engineers, U.S. Army.

Major A.K.B. Lyman, Corps of Engineers, U.S. Army,
District Engineer, Duluth, Minnesota, repre-
senting the United States Government.

Professor C.O. Wisler, Consulting Engineer to the
American engineering representative.

S.S. Scovil, Consulting Engineer, representing the
Canadian Government.

2. J.T. Johnston, Ottawa,
Director, Dominion Water Power and Hydrometric
Bureau.

I.R. Strome, Ottawa,
Dominion Water Power and Hydrometric Bureau.

Chester S. Wilson, St. Paul, Minnesota,
Assistant Attorney General, representing
Henry N. Benson, Attorney General,
State of Minnesota.

E.V. Willard, St. Paul, Minnesota,
Director of the Division of Drainage and Waters
of the Department of Conservation of the State
of Minnesota, representing W.T. Cox,
Commissioner of Conservation.

Arthur F. Oppel, St. Paul, Minnesota,
Deputy Director of the Division of Forestry of
The Department of Conservation, representing
Grover M. Conzet, Director of said division.

B.F. Case, St. Paul, Minnesota,
representing Stafford King, State Auditor of
the State of Minnesota.

W.O. Rogers, of Cobb, Hoke, Benson, Krause & Faegre,
St. Paul, Minnesota,
representing the Receivers of the Minnesota &
Ontario Paper Company.

Adolph F. Meyer, Minneapolis, Minnesota,
representing the Receivers of the Minnesota &
Ontario Paper Company, and also appearing in his
own behalf.

Frederick S. Winston, Washington, D.C.,
on behalf of the Quetico-Superior Council.

3. Mr. Magrath: Is the Province of Ontario represented here?

Sir William Hearst: No, Mr. Chairman, it is not. I did not understand that there would be anything in the nature of a formal hearing today, and I told them it would not be necessary for them to come.

Mr. Johnston: There is no appearance for the Province of Manitoba or the Province of Ontario.

Mr. Magrath: I have just returned to the city and I was not aware that there was anything approaching the nature of a hearing; but, gentlemen, we are pleased to have you here, because probably you will be able to gain information that will be useful to you and useful to us in further hearings. It has been suggested that inasmuch as the Backus interests are represented here perhaps Mr. Meyer might be disposed to submit any observation that he wishes to present to the Commission.

4. Mr. Meyer: Mr. Chairman and members of the Commission and representatives of the various interests concerned in this matter, the Receivers of the Minnesota & Ontario Power Company have not had sufficient time to go into this matter fully and determine questions of policy respecting future developments on the upper waters. I have, however, spent some considerable time on their behalf and personally on my own behalf as consulting engineer at one time representing the United States in the Lake of the Woods investigation.

No doubt you all recall that Mr. Arthur V. White, of Toronto, and I were acting as engineers in the Lake of the Woods investigation from 1912 to 1917; that based upon the report of the Commission in that matter and the report of the consulting engineers to the Commission a treaty was formulated, newly ratified and put into effect, and has been in operation for some years under which the Lake of the Woods is regulated in a certain manner. Personally I have assumed that that treaty stands for the present investigation; that it is a question of further development of storage and power on the upper watershed that is primarily before this Commission.

5. In examining the several reports that have been made by your engineers I find myself in agreement with the preliminary reports of 1929 and 1930, but I regret to say that I am not in agreement with many basic data presented in the later report which has been referred to by Mr. Scovil as primarily the results of a reinvestigation by his colleague Major Bullard and his assistants. I find that in the last report many of the conclusions arrived at respecting the upper waters in our Lake of the Woods report are cast aside and others substituted therefor.

I have taken up a few matters with Major Bullard's successor, Major Lyman, and had hoped that there might be an opportunity for the engineers to get together to thrash out their differences. It appears from the correspondence that thus far at least your Commission has not authorized the release of such information as I requested which might permit the engineers to get together to iron out their differences. For example, one of our main differences is the relation between the natural stage of Rainy Lake and the outflow from that lake at various stages.

We also differ respecting the relation between the natural outflow and stage on Lake Namakan. The result is that our basing point, which is the condition of nature, is lost. The computed natural levels for Rainy Lake and Namakan Lake as presented in the last report are at variance with those presented in 1929 and 1930 to which we agreed because they were founded upon the basic conclusion respecting relations between outflow and the lake stage that we had adopted in the Lake of the Woods investigation. If the present conclusions hold respecting that relationship in a state of nature, then in 1927 Rainy Lake in a state of nature would have been about two feet lower at the crest of the flood than it was according to the previous computations and conclusions.

6. We consider that there is substantial difference that should be ironed out before we can proceed with the whole problem of storage and regulation. We believe we have data that fully confirm the conclusions of 1917 and 1930, which, unfortunately, do not appear to have been found by the engineers in the later investigation. I refer particularly to observations of slope fall between Rainy Lake and the dam during the flood of 1916 from which coefficients of discharge can be arrived at and which can be used for the computation of that relationship and in the checking of that relationship between the natural level and the natural outflow. Those records are here in these offices and in the offices of the Commission at Washington. They are among a mass of data which were not published and which could not have been published. These were observed during the flood of 1916. In my opinion they leave no room for doubt as to the accuracy of those original curves which were accepted in the report of 1930 and which are at variance with the later report.

I hope it will be possible for your Commission to arrange so that we engineers can thrash out our differences on the technical grounds, and try to arrive at a common conclusion. Until that is done it is idle to talk of storage and regulation as we see it. We believe a great deal of time would be saved

7. if that could be possible.

This morning in the few moments at my disposal before coming here I presented some of the basic curves to your engineers, both the American and the Canadian engineers. I might mention something of the background on which we are working. We believe if you check the data you will arrive at the same conclusion. I am not speaking for them, but I do believe that we engineers can get together on some of these fundamental matters.

I find in looking over the published reports that there are a few things more or less minor and all of which can be readily thrashed out if we can get together and the details of our computations be made public. There is no reason why we should burden your Commission with matters of detail of this kind.

I might refer to page 47 of this published table, in which a figure appears that shows that in 1917 the level of Rainy Lake varied 7.2 feet between November 1st and June 1st. Evidently that figure is in error because the records show a variation of about 7.8 feet for that year. That is so large that the average stated at the bottom of that column, which is 2.9, becomes about 2.6. The natural variation was 2.1. In other words, that one

8. figure practically cuts in half the difference between the variation under control and the variation in a state of nature. In that same column no variation is shown for the year 1925. As nearly as I can make out there is a variation of about 2.1 feet.

These are some of the differences that we engineers should thrash out among ourselves, but it must mean that the Commission will authorize the engineers to throw their cards on the table and let us as representatives of the power company and myself personally as previously acting as engineer for your Commission to see those computations in order to find out wherein our differences originate.

In this important case that I refer to I believe it resulted from their failure to find these certain records which were matters of knowledge to me, of course, because we made the observations in 1916.

So far as the matter of a project is concerned, I intimated awhile ago that the Receivers had not yet been able to determine upon a policy looking into the future. I am willing to give you my views personally in a preliminary way if you choose to have me do so. I do not have authority to commit my clients, the Receivers, at this time respecting possible future development of the upper watershed in the way of power and storage.

9. Would you consider it desirable, Mr. Rogers, for me to make a statement on some of those matters? Would the Commission like me to make such a statement?

Mr. Magrath: Go ahead.

Mr. Meyer: In a general way, and as far as we have been able to study the project for future storage and future power development, we are inclined to adopt a project that involves much less storage and much less variation in lake levels and less power development because on the basis of the information presented it would appear to be, from our viewpoint, rather too expensive storage and power.

Mr. Stanley: Whom do you mean by "we"?

Mr. Meyer: I mean Mr. Backus, and, to some extent, the Receivers and myself personally who have discussed it in a preliminary way but have not yet determined upon a policy. I am authorized to make a study and report to them. We are in the midst of that study now. I am just trying to indicate trends which may help some of these men here in these problems if my own view holds with the Receivers later on. I can not vouch for that. Neither do I suppose they can.

10. I just wanted to point out that we believe, and I personally believe, that the method of regulation which will make the control of outflow from Rainy Lake depend upon the needs of the Winnipeg River water powers and will give us power and storage only in so far as it is consistent with the provision of the maximum dependable outflow from the Lake of the Woods will not meet with my personal approval, and I doubt whether it will meet with the approval of my clients. In other words, the type of regulation recommended, in so far as it affects Rainy Lake, stating specifically that the flow shall be the maximum dependable consistent

with the above; namely, the maintenance of the maximum dependable outflow from the Lake of the Woods, will not meet with our approval. We are figuring on much less storage on Saganaga Lake and Northern Light Lake; and we contemplate the possible development of power at the outlet of Sturgeon Lake in Canada and the utilization of the Saganaga storage in connection with development as offering probably larger return on the investment. We believe that that project would eliminate the diversion to the boundary and the regulation of that storage primarily for the benefit of the lower plants at the outlet of Basswood, if installed, and at the outlet of Lac Lacroix in particular. We are inclined to believe in particular that the smaller upper plants will not prove economical.

11. For some time I have been personally considering primarily the development of the Lac Lacroix water power, which involves an important question, namely, that of the possibility of diverting water to the boundary in order to afford a more economical development. It is true -- and I might as well state it now -- that it is possible to divert that water from the Namakan River and develop it economically in Canada. I might just as well put my cards on the table.

Mr. Magrath: Will you repeat that, Mr. Meyer?

Mr. Meyer: It is economically possible to divert water from the Namakan River to a site entirely within Canada and develop that power economically which can not be economically developed on the Namakan River because it is divided into so many falls and much of the fall would be lost in the rapids which can not be economically developed. We recognize that fact. We still believe, from the viewpoint of the interests of both countries and of navigation and recreation on those upper waters, that diversion to the boundary would be beneficial to both countries.

In proceeding with our studies of possible power projects on this watershed we would like very much to know what the attitude of the Commission is going to be in the matter of diversion of water from streams entirely within Canada to boundary channels.

Mr. Stanley: Would that diversion occur elsewhere than in Lac Lacroix?

12. Mr. Meyer: Particularly in Lac Lacroix unless Basswood's powers are developed and the Saganaga storage is diverted to the boundary for the benefit of those powers. More power can be developed if the Saganaga storage is used down the boundary over the Basswood Falls and through the Basswood development and also the Lac Lacroix development.

That, just in brief, is our present position. I am sorry that I can not speak more definitely at this time. On one thing, however, I think I have spoken definitely and with the full approval of the Receivers, that is, we can not accept large portions of the latest report of the engineers in so far as it relates to natural levels on Rainy Lake, on Namakan Lake and all comparisons of the benefits of storage with natural conditions. It affects also the natural levels of the Lake of the Woods. Those methods of regulation assume the possibility of different control on the Lake of the Woods. We have not been willing to accept that as a promise.

Before we proceed with further studies it should be possible for the engineers to get around the table and thrash out their differences. We are perfectly willing to start with the records so far as they were published up to 1929 and 1930 in the preliminary report. Thank you, gentlemen.

13. Mr. Magrath: Before you set down, Mr. Meyer, how long would it take to have that round table talk and get results?

Mr. Meyer: Of course, that would be difficult to say. In so far as the specific things I have mentioned are concerned we may be able to arrive at a conclusion rapidly and we may not. Then, of course, there are many other matters in the report that I have not been able to touch upon and that I would want to examine; and I would like the privilege of being able to get together with your engineers as to the basic computations that lead up to those conclusions.

Mr. Magrath: The difficulty that has always confronted the Commission is that we have wished to bring together certain data and furnish the public with intelligent data, following which we could have a hearing. That has been our difficulty up to the present time and the delays have been due to that. The question in my mind is what further delay will be necessary, because I think we should notify the public as to when we expect to give them data that will enable them to intelligently discuss this matter.

14. Mr. Meyer: Yes; I feel that the situation is very unfortunate that I find it necessary to come here and take exception to this last report both on behalf of the Receivers and on my own behalf as one of the Commission's engineers at that time. Mr. White fully concurred in them. The details of working out the curves were left mainly with me while Mr. White was working on other phases of the report. So I feel that I have a double interest in the matter.

I feel that it is unfortunate that the data to which I have referred were apparently not in hand when your engineers reached their conclusion respecting the relation between outflow and stage. There is nothing in the report that indicates that they were available. In fact, there is a specific statement respecting the surveys we made at that time and the surveys of the Department of Public Works; and the difficulty of determining a coefficient. That difficulty vanishes when those difficulties we considered in 1929 are taken into consideration.

Mr. McCumber: How long have you been employed in this work as a representative of the companies you speak of?

15. Mr. Meyer: My employment has been intermittent. I have been employed as a consulting engineer; never for the receivership and never with a retainer. I was employed on flowage cases in both countries in 1920. I was employed in connection with power rights at the outlet of the Lake of the Woods in 1922 or 1923. There have been periods of three or four years when I have had no connection whatsoever with the power company and did no work for them and received no pay from them; but I have been engaged on specific matters from time to time over the entire period since a year or two after the publication of the Lake of the Woods report.

Mr. McCumber: This matter was submitted to the Commission in 1925 and immediately thereafter the engineers from both countries began their work. During considerable of the time since 1925 you have also been employed in connection with and worked on the same project?

Mr. Meyer: Slightly from time to time.

Mr. McCumber: Did you corroborate to any extent or attempt to do so with the engineers who were at work so as to ascertain whether you could agree on any of these matters?

Mr. Meyer: I did, sir. I tried to supply the data that were requested. There is a record in my office of quite a substantial file of material that went forward, but I was not able to get all the information that was desired. In the spring of 1921, in April, we had a conference in which I spoke very frankly about our views respecting storage and further development, and I have tried to keep in touch with the investigation
16. so far as there was an opportunity.

Of course, respecting this matter there was no opportunity for me to get in touch with them, and neither did I know of any differences arising because of the fact that some data were not before the men who were doing the work.

Mr. McCumber: Were the data that resulted from our own investigation furnished to the American and Canadian engineers who were at work on the problem?

Mr. Meyer: Unfortunately this one matter that I referred to was developed only Saturday morning, and the copies were sent to Major Bullard and to Mr. Scovill this morning indicating our attitude respecting the curve. I do not feel that the detailed calculations relating to the recommendation come within the scope which the Commission has authorized to be released to the public.

Mr. McCumber: In 1925 at the first hearing we held on the subject it was intimated to Mr. Backus and to all others that the Commission would be pleased to have all the engineers interested in these projects collaborate with one another and work together for the very purpose of getting an absolute agreement between the engineers who alone could pass upon the scientific questions that were to be presented. They are technical and the Commission, of course, would not understand them without a report from
17. the several engineers, including those of the Backus interests, and it has always been a surprise to me that they were not working together in such a way that they could all bring their matters before us and lay their cards on the table long before this.

Mr. Meyer: I might say that I was not present at the hearing of 1925. I was not at that time retained by the power company in any manner. I had no connection with the project until at least about a year and a half or two years ago.

Mr. McCumber: As indicated by the Chairman, the Commission would like to have as soon as possible the engineers get together and present to us something that they can agree upon without delaying the matter too long.

Mr. Meyer: Mr. Rogers has just called my attention to the fact that, of course, we are entirely in agreement with the data so far as published; the plates, tables and text, these three volumes that were published, together with considerable material in typewritten form, in 1930. We were waiting for power and storage studies, using these as a basis. My office is full of curves all based upon these.

18. And now there is a new report that overthrows all of these so far as Rainy Lake and Namakan Lake and natural discharges are concerned. Therefore, with that as a basing point the benefits from storage as compared with nature will all vary.

Mr. Magrath: To what extent, in a practical way and expressed in power, is the difference between the figures that you have been dealing with and the previous figures?

Mr. Meyer: So far as the exact amount of power at any given site is concerned I can not tell you what that difference is; but I feel that the difference is not so much whether we use one basis or the other, but the important point comes in when we get down to this basing point, which is the condition of nature.

For example, it is of the utmost importance whether in the flood of 1927 Rainy Lake in a state of nature would have gone two feet higher according to our computations than according to the computations of your engineers in this latest report. That is of the utmost importance. The same is true with respect to the flood of 1916. It is of the utmost importance when we come to determine what constitutes ordinary high water in those lakes. So I say that so far as power studies are concerned there probably is not such a great difference, but when you come to figure the economy of developing a certain power, then it must be evident that the basing point must be correct or your conclusions can not be correct; and the condition of nature must be the basing point.

19. If we can get a certain regulation at a certain mark and we say that would represent a mark up to which the Federal Government holds an easement, it is one matter. If we have to go a foot or two or three feet below that, it is quite a different matter.

Mr. Bartlett: Mr. Meyer, on the question of storage, to get more power and more equal power there must be a question of building dams, how high they should be built and what the effect would be. That seems to be one question. Now, when you speak of the height of the water, for instance, in Rainy Lake at its natural high water mark in the past does that question enter into the question of storage or into the question of the regulation of the height of Rainy Lake?

Mr. Meyer: It enters into the question of the cost of various amounts of storage and the question of whether or not the man who is going to get the benefit, whether on the Winnipeg River or at the outlet of Rainy Lake or at the outlet of Lac Lacroix, is going to be willing to pay for the cost of that storage.

Mr. Bartlett: We have been up there and have been over these lakes so I have a visualized understanding of it but not a technical understanding. Rainy Lake is the lake whose outlet furnishes your power, is it not?

Mr. Meyer: At the present time, yes, sir.

20. Mr. Bartlett: Now, assuming for the moment that you are not going to build dams and establish reservoirs up the line, does your question of original curves still apply? Are you talking about the question of our regulating the height and the lowness of Rainy Lake? Is that largely what your curve portends?

Mr. Meyer: It has a very definite bearing upon the future of Rainy Lake in so far as additional storage and the use of that additional storage are concerned.

Mr. Bartlett: Just for the sake of getting an understanding, do you understand, Sir William, that the Reference involves our establishing high and low water marks for Rainy Lake?

Sir William Hearst: My recollection is that we are required to say at what level Rainy Lake should be held.

Mr. Bartlett: Does not that mean if it is economically feasible to build these dams and establish these reservoirs?

Sir William Hearst: I assume that the whole thing is predicated on the economical feasibility of it.

Mr. Bartlett: As a hypothetical question, if we should decide that it was not economically feasible to build these dams for making storage basins, would the question of establishing high and low water levels for Rainy Lake still be in this Reference?

21. Mr. McCumber: The question is what elevation to recommend if it is found to be practicable.

Mr. Bartlett: What I am leading up to is this, Mr. Meyer; you were speaking of some curves, which I take it represent the natural height of the water on Rainy Lake and at flood seasons and other seasons. Is not that what you mean?

Mr. Meyer: Yes; the level that would prevail if there were no dams.

Mr. Bartlett: You get at those natural curves first?

Mr. Meyer: Yes.

Mr. Bartlett: And that is the question on which you differ with the others?

Mr. Meyer: Yes.

Mr. Bartlett: Is it true that that involves our determining at some time or other under some proceeding the height and the lowness of Rainy Lake in some similar manner that they did in the case of the Lake of the Woods?

- Mr. Meyer: I think it does. In Question 4 you are asked, "What interests on each side of the boundary are benefited by the present storage?" The basis of benefit must be the condition of nature. For example, if in time of flood the present storage dams will keep that water two feet lower than it would have been in a state of nature, that is one benefit to somebody other than the power company.
22. When they keep it up to get more water that is a benefit to the power company. But it makes a lot of difference if that water were two feet higher and had done a lot of flooding.

Mr. Bartlett: A flood season would give you more power until the flood naturally subsided, but would the natural height give you any right to hold it there?

Mr. Meyer: That was not my point, although the law on the United States side, I claim, does give us that very right to hold it where it would have gone in a state of nature.

Mr. Bartlett: At flood tide?

Mr. Meyer: At flood tide; because it says that sufficient capacity shall be provided so that the water will not go any higher in time of flood than it would have gone in a state of nature.

- So I say it is of the utmost importance to determine where the water would have gone in 1927 and where it actually did go. If we could have kept that water up two feet higher we would have had an additional storage. There would have been many benefits to the power company if we had let it go, but because of all the clamor -- because no one knew how high it would go in a state of nature -- the water was released at the request of the Department; and as a result of public clamor that the
23. dam was creating a flood, we contend that the figures prove conclusively that the lake would have gone two feet higher and would have stayed all summer in a state of nature. We consider that of the utmost importance.

Mr. Bartlett: I am not sure whether I understand it, but you have helped me a little, anyhow.

Mr. Meyer: I am very sorry. I would like to make that entirely clear.

Mr. Bartlett: You can not educate me in matters of engineering.

Mr. Stanley: Mr. Meyer, do you mean to say that the water during those floods would have gone even higher in a state of nature than they did with the dams erected?

Mr. Meyer: Yes, for this reason; when those dams were built they were placed below the natural falls and a deep rock cut was made through the natural tongue of rock that extended out in the river and restricted the flow of water so as to permit the water to get to the dam and to the sluice gates. A Canadian canal exists in which there are headgates. The water was permitted to discharge through those gates. Over at the Canadian power house there were islands with trees growing on them. That entire rock mass was excavated to make an approach to the Canadian power house. The capacity to discharge the

24. water is much greater than it was in a state of nature. Therefore, you can get the water out of the lake much faster than in a state of nature and thus keep the water from rising so high, because the level of the lake has a relation between inflow and outflow. If you make your outflow larger with the same inflow your lake will not be so high. It is just a balancing made possible by this rock excavation through this natural tongue that necessitates the river making a complete right angle turn and another turn before it tumbles over the falls.

Mr. Bartlett: You mean by the excavations which you have made in building your dams you have made it possible to drain the lake more quickly than nature would, and that by virtue of compensation for those cuts and that additional outflow you have a right, by means of your dams, to hold it back to the extent that it would have been held back by nature?

Mr. Meyer: Yes; and we make it possible to do that without making the lake go higher. If we put a dam in a natural outlet and do not first increase the outflow capacity by rock or earth excavation, that lake would inevitably go higher under control than in a state of nature.

Mr. Wilson: What was done in that respect at the Kettle Falls Dams?

25. Mr. Meyer: Also considerable rock excavation was made to increase the outflow capacity in a similar manner!

Mr. Wilson: Did that excavation extend below the natural bed in depth as well as in width at the Kettle Falls Dams?

Mr. Meyer: I have not the detailed information here; but, as I recall it, yes.

26. Mr. Stanley: Your contention is that there was no raising of the natural level, of the original shore level in the impounded waters by virtue of the erection of the dams at International Falls and Kettle Falls?

Mr. Meyer: The question of natural flow makes it just a little difficult to answer that question, but I am sure that I can clear the matter up in a moment. There is no doubt about the ordinary level during the year being increased by storage in order to utilize that water. I was referring to the flood level and I wanted to show you a chart that shows the raise as it would have been according to our computations and the level that actually existed. That, I think, will show you quite clearly what I mean. Unfortunately there are so many papers and I cannot get just the one that I want. Meanwhile may I make this comment, that Mr. Rogers has just suggested that the importance of the data that I speak of, of that base data, is shown by the fact that the American engineer felt it necessary to make this reinvestigation of base data. That should be the best indication of the importance of the base data. The black line on this chart which I have in my hand shows the actual level on Rainy lake in 1927. You will note there was comparatively little variation in level during the year. These two curves, one red and one blue, show the variation that would have

27. taken place if there had been no dam at the outlet. You will notice that the water would have been higher in the state of nature during the summer, but it would have been lower during the spring and during the fall.

Mr. Magrath: Can you say how much higher or how much lower?

Mr. Meyer: There would have been a variation from spring to summer in a state of nature of about ten to eleven feet and there actually was a variation of about three or three and a half feet.

Mr. Magrath: In what year?

Mr. Meyer: In 1927 and during the summer of 1927. According to our computations the level in the middle of July actually would have been between two and three feet higher in a state of nature than it actually was. According to the latest report it would have been only a foot higher in July and the highest point reached would have been only a few tenths of a foot higher than the actual level. That is why I say that the matter is of the utmost importance.

28. Mr. Bartlett: I am getting out of my kindergarten frame of mind, so perhaps I may ask another question. Do I understand if, in a state of nature it floods to a certain point on a man's land, for instance, that your right to build a dam gives you the right to hold it all the time at that extreme height?

Mr. Meyer: No, not at all.

Mr. Bartlett: Do you claim any rights under your charter in the state, or whatever powers you have, to build a dam to hold the water higher than it would be by nature?

Mr. Meyer: At certain times of the year.

Mr. Bartlett: You have that in your charter?

Mr. Meyer: The act of Congress authorizes the construction of that dam in the interest of navigation to a height to hold the level at high water mark.

Mr. Bartlett: All the time at high water mark?

Mr. Meyer: If we so choose, but if we held it there all the time we would not get the benefit of the storage.

Mr. Bartlett: But you have the power under the charter to hold the water as long as you please at the flood height?

Mr. Meyer: At high water mark. It does not say "extreme high water mark" and we do not claim it to mean that. It says "high water mark". That elevation was shown at 497 on the plans that received the approval at that time.

Sir William Hearst: High water mark was a fixed point on your plans?

29. Mr. Meyer: It was fixed at the height of the dam as shown at 497 with reference to the flashboards to raise it to the extreme high water mark of 500 or 501. That is more or less ratified, and our rights in Canada refer to it in the same way that the use or non-use of the flashboards shall be under the proper control of the Government of Canada.

Mr. Bartlett: In the United States have they anybody exercising control?

Mr. Meyer: I do not think there is anybody there, but I think Major Bullard could say what part the United States representatives took in that.

Major Bullard: There is a general supervision with respect to navigation, but the supervision has never been a very active exercise.

Mr. Bartlett: Your charter, as you understand it, gives you the right by your plan to hold the water at high water level, using the term "high water levels" perhaps in the sense that it is the mean or average high water mark. Is that your understanding of it?

Mr. Meyer: That is a question just what that phrase means, what particular height.

Mr. Bartlett: That or the flood height?

30. Mr. Meyer: We do not think it means either extreme.

Mr. Bartlett: Probably the mean high water mark. See if I get you. By virtue of building a dam you have widened and deepened the channel so that you could, if you so desired, drain the lake faster than it would drain by nature?

Mr. Meyer: Yes.

Mr. Bartlett: So that you perhaps claim a right to find out where the high water mark is and hold it there as long as you think it would be held there by natural forces?

Mr. Meyer: We feel that under the act we have the right, in time of extreme flood such as that of 1916 and 1927, to let the lake rise above the level at which we make any claim to have the authority to hold it under ordinary circumstances, but only as much as it would go under natural conditions. We claim to have the right to hold it at a certain level to use the ordinary storage during certain years.

Mr. Bartlett: How long can you hold it there at this high point?

Mr. Meyer: We feel that the right is to hold it there in order to store the water and improve navigation and power.

31. Mr. Bartlett: You think the charter gives you the right of storage as well as the right of power?

Mr. Meyer: We decidedly think so and that it adds to that right the right to let the lake come up in time of extreme flood to the level that it would reach in a state of nature and then recede to this fixed level again at which we could hold the water and utilize it. Remember in time of flood the water is being released at four times the rate, roughly, at which you can utilize it. We get two or three reservoirs full in time of flood and then for ten years we have enough water to suffice.

Mr. Bartlett: Does this theory go between you and the commission engineers?

Mr. Meyer: Not the theory, but the fact as to this relation between the natural level and the natural rate of outflow. We have that natural level upon which we can measure the advantage of regulation.

Mr. Stanley: As I gather it from this plan you have here of Rainy Lake, the effect of this structure would be at certain times, by the computations of both the Canadian and the United States engineers, to raise the level of the lake above what it would be in a state of nature?

32. Mr. Meyer: Yes.

Mr. Stanley: And to lower it at other times below what it would be in a state of nature?

Mr. Meyer: Yes.

Mr. Stanley: Can you tell me from an examination of that map just how many months in the year this dam would lower the level of the lake below what it would be in a state of nature?

Mr. Meyer: Only during the flood water months.

Mr. Stanley: Actually lower it?

Mr. Meyer: It would lower it only during the time of flood water and that would be during the months of June, July and August of 1927 as shown on the chart.

Mr. Stanley: Those are the months in which it would raise it above the natural level?

Mr. Meyer: This is the actual level?

Mr. Stanley: This is above it?

Mr. Meyer: But that is the natural level it would obtain.

Mr. Stanley: "Actual level" it says here?

33. Mr. Meyer: Actual level. But this is the computed natural level. The dam is there and did hold the water as shown by the solid line. If the dam were taken away and the water taken away, the difference would be shown by the difference between the two curves. It is very substantial, amounting to about two feet in the summer.

Mr. Stanley: The effect of the structure would be in the flood months --

Mr. Meyer: In occasional years.

Mr. Stanley: -- to raise it above the natural level, some months below and other months above?

Mr. Meyer: It is a much more uniform level.

Mr. Stanley: Would this uniform level established by these dams raise or lower the lake above the computed level in a state of nature? What would be the difference in the level of the lake as computed after the erection of these structures and the level of the lake in a state of nature?

Mr. Meyer: Do you mean taking the entire year from year to year over a long period?

Mr. Stanley: Yes.

Mr. Meyer: The general average would be higher.

Mr. Stanley: How much higher?

Mr. Meyer: I cannot tell you that offhand. That depends on this relationship that is under discussion. It
34. might be three feet.

Mr. Stanley: It might be less?

Mr. Meyer: Well, roughly, three feet. Say, call it three feet.

Mr. Stanley: What would be the effect upon the natural condition of the shore line and the vegetation of the change of the level established by a state of nature, the raising of it three feet above this level? What would be the effect upon the natural shore line, that is upon the beaches that were established by a state of nature and the vegetation that had grown up in a state of nature?

Mr. Meyer: Wherever the shores are high and rocky you could go for miles and tens of miles and possibly several hundred miles without finding any indication of any change. I did so in 1914 personally. When you come to a bay or inlet where there is deep soil, the vegetation will show that it cannot continue to grow; there will be dead trees in bays and inlets.

Mr. Stanley: You will kill the vegetation where it overflows?

Mr. Meyer: Yes.

Mr. Stanley: What would be the effect upon beaches, sand bays and things of that kind?

35. Mr. Meyer: The beaches in places where there is natural sand would be covered and the surface removed. For example,

during the summer of 1916 the western section of the lake has a bay that is bordered by sand. That one flood of 1916 stripped the rubbish off and left the long beach exposed above the normal level that had been there before the flood. If you go to a point where there are rocky shores and only a little sand beach, the sand beach would be obliterated, and if there was a steep bank behind it, it could never reform. But in some way the beach will reform. Nature will provide those beaches again because nature provided it in the first place and it is only a question of time where and when the beaches will reform.

Mr. Stanley: Can you tell me how much time?

Mr. Meyer: In this case where there is sandy material, one year will do it and on many lakes the beaches are there. In other cases I would say it would take possibly two generations to do it.

36. Mr. McCumber: I can understand the informative value of ascertaining what the high level would be at the highest in a state of nature before you had widened this outlet, but inasmuch as you already have a charter and that charter fixes the sea level datum at 1108.61, it seems to me that the real value now is to determine what effect the recommendation made by the engineers would have upon the situation that now exists with that dam there, because we start with that dam as it is submitted to us, and the question that is submitted is to what extent, if any, we should authorize the raising of the lake above what it is now, not by a state of nature but with all these gates and so forth and the widening to get rid of the channel. I could understand it better if your argument were directed towards that point of where we now begin with 1108.61 and with the dam already erected and with the gates for increasing the outflow.

Mr. Meyer: But there is this other question that is specifically asked of your commission to determine the benefits of present storage. The benefits must involve the basic point which is the condition of nature.

Mr. McCumber: I understand that is a different feature.

37. Mr. Meyer: On the other feature we could quite neglect that and consider the question of additional storage and what the benefit of additional storage would be compared with the present. The whole thing goes back to a state of nature for all comparisons. Supposing you put additional storage on those lakes, the benefits finally can be measured in a state of nature both on the Rainy and the Winnipeg rivers.

Mr. McCumber: You say it goes back of that. Here is the question; it is very clear:

"To regulate the level of Rainy Lake in such a manner as to permit the upper limit of the ordinary range of the levels to exceed 1108.61 sea level datum,"

and then, if that is found practicable, what elevations are recommended. It seems to me we must start with that dam in Kettle Falls as it now is and make your determination upon that basis.

Mr. Meyer: Fundamentally I would say yes, but it is

38. always difficult to get this measure of advantage and desirability. Suppose we go about to prove whether it is practicable. First of all we might consider it practicable to do so if we consider the physical possibilities. We might consider the practicability from the physical possibilities' viewpoint. But from the viewpoint of whether it is economic or not, we must find some basic plan from which we measure, and if we accept the dams and a certain type of regulation in the past and then superimpose some new form on this which means additional storage, we might get some measure that would serve the purpose. I am not saying that it cannot be done in that way.

Mr. McCumber: Your present operations will prevent the water ever rising as high as it would in a state of nature?

Mr. Meyer: If operated as it was operated.

Mr. McCumber: If operated properly, and that being the case, it seems we get right back to the proposition that we are to start with the condition as it now exists with all the facilities of getting rid of the surplus water in time of flood and then determine what is the better method of dealing with the whole subject.

39. Mr. Meyer: But when we come to damages, are we not faced still with the situation of what would happen in time of flood if there were no dams there, because if the level, for example, in a state of nature, would go up to this maximum level which is two feet higher, say, than the present level that we might accept in our answer to this question of providing additional storage, we should know, I say, whether it would go up to that upper level or stay two feet below, because how can we show the desirability or the cost of this additional rise unless we have the condition of nature to compare with the condition of control?

Mr. McCumber: What was submitted to the commission is, in my own individual opinion, what damage will result from raising the level under present conditions and not what that would have been had things been left in a state of nature, because we have the condition as it now exists and we are to base our damages, if I read this matter correctly, for what further damages there are, upon what may result from whatever operation may be agreed upon.

Mr. Meyer: But in determining this cost of raising and the damage that is done, will we not have to know what the level in a state of nature would have gone up or stayed down to?

Mr. Bartlett: You have to know what your original rights were.

40. Mr. Meyer: Assume our original rights were to hold it to the level of the ridge. We are now considering the advisability of raising it two feet higher. When we consider the advisability and cost of doing so, we must know in a state of nature whether it got one foot higher or two or three feet higher.

Mr. Bartlett: I do not understand what it is Major Bullard has kept you from seeing. What is it that Major Bullard

or anybody else has kept you people from seeing?

Mr. Meyer: The report sets forth a new relation between lake level and outflow which results in a conclusion that in a state of nature in the flood of 1927 we will say, the lake level would only have gone to the height of this table, for example, whereas according to our conclusions it would have gone two feet higher.

Mr. Bartlett: We all thought you were seeing everything we had. What is there you have not seen?

41. Mr. Meyer: The base data I felt Major Bullard did not have at that time. Those were the slope readings we made in 1916 which are not published and only in blue print form in the offices of the two commissions with the other field notes, and so far as I can determine they never came to their attention, and those slope readings during the flood of 1916 in my estimation absolutely prove the correctness of the curves published by your engineers and adopted by us in 1917.

Mr. Bartlett: I thought you gave the impression the commission had not given permission to you to see everything.

Mr. Meyer: Well, the letter that I read from indicates that those computations for which I asked are not among the computations that the commission has authorized to be released to the public. This was the request. I have the answer here:

"With reference to the calculations that you have requested I do not feel that detailed calculations relating to the engineering phases of the river come within the scope of the material which the commission has authorized this office to release to the public."

Mr. Bartlett: Who is that from?

Mr. Meyer: From Major Lyman on September 13th in answer to my request for certain calculations.

Mr. Bartlett: That is this September?

Mr. Meyer: Yes.

42. Sir William Hearst: That refers to calculations made by the International Board of Engineers, I assume?

Mr. Meyer: Yes.

Sir William Hearst: And if I understand you correctly, your contention is that certain data exist in the offices of the International Joint Commission that the International Board of Engineers did not have before them?

Mr. Meyer: That is correct. They are summarized on this sheet of paper.

Sir William Hearst: You say that by reason of that lack of information they have gone in error?

Mr. Meyer: That is my belief.

Mr. Bartlett: I should like that cleared up.

Mr. Meyer: Yes, I should like that cleared up and I do not want any room for doubt about our acceptance of all the printed, published data of 1929 and 1930 which include the relationship between Rainy Lake outflow and stage, adopted by us in 1917, accepted by Mr. Scovil and Major Crawford in 1929 and 1930 and published in these reports. We accept those; we stand on those.

Mr. Bartlett: Do you give the impression that the commission should have permitted you to see something and refused to do it?

43. Mr. Meyer: I cannot say of course the commission has not given permission, but apparently the authorization to the engineers was not sufficient to permit the Duluth office to turn over to me and permit me to examine computations which I hoped would lead to our getting together on a common ground respecting this outflow relationship.

Mr. Bartlett: I expect Major Bullard can explain what he means. I do not know.

Mr. Stanley: As I understand you, the data was available, but not the engineering computations from the data?

Mr. Meyer: The data involved computations and those computations ended, I might say, in a curve of relationship between natural lake level and outflow. We disagree with those as published this spring in the report of the reinvestigation by Major Bullard and his assistants. We agree with the earlier reports and of course with our own report of 1917. I tried to find out the reason for those new deductions and conclusions and tried to get the detailed computations that were basic thereto.

44. Mr. Stanley: What I am trying to get at is this: You were permitted to see the data, the observations made by these various engineers, as I understand, but not the deductions that they made from those. Is that correct? The various observations and lake levels as made by the two governments were available to you. Is that correct?

Mr. Meyer: They have become available in this report just published and in the reports of 1929 and 1930.

Mr. Stanley: But the deductions they drew from those various observations and levels were not available to you. Is that correct?

Mr. Meyer: The deductions so far as expressed in natural lake levels were, yes, and they differed from our earlier conclusions, and I tried to find out the reason for this difference.

Mr. Stanley: If the data and the deductions were available, what were not available?

Mr. Meyer: The computations that led up to the deductions. We disagree respecting the conclusions and I tried to reconcile them.

Mr. Stanley: In other words, the observations and recorded data as to various lake levels you have and their conclusions from that data. What they did was not to show you how they reached the conclusions?

Mr. Meyer: Yes.

45. Major Lyman: The method used in making these deductions is described in detail starting on page 202 of our engineers' report.

Mr. Stanley: Then you had the data and also the conclusions?

Major Lyman: And also the method described.

Mr. Stanley: He only wants to know how you reached those conclusions.

Major Lyman: The method is described in the engineer's report.

Mr. Stanley: Was that data available?

Major Lyman: Yes.

Mr. Stanley: I believe you have stated this, but I did not catch it correctly. Just state again for the record wherein you differ from these various engineers in the 1932 report in your conclusion as to lake levels and inflow and outflow from the conclusions reached by these engineers.

Mr. Meyer: We differ respecting all the computed natural levels for Namakan lake, Rainy lake, Lake of the Woods. We therefore disagree as to the basic point from which benefits and costs must be measured, which is the state of nature.

Mr. Stanley: What is that difference, I mean in feet and inches?

46. Mr. Meyer: That difference amounts to two feet during the flood of 1927, which in my judgment is of the utmost importance. The difference is not serious so far as low water is concerned. We differ respecting all the computations leading up to the deduction of ordinary high water mark on those lakes, because they involve what we consider are faulty premises. I have stated that I believe the reason for that is that these slope readings taken during the flood of 1916 did not come to the attention of Major Bullard and his assistants when they were making these computations because these computations absolutely controvert the report of 1917 and the reports of your engineers of 1929 and 1930 so far as natural lake levels on Rainy Lake, Namakan Lake and Lake of the Woods are concerned.

Mr. Stanley: As I understand you, you differ with them as to the height of high water in certain months during the flood of 1927. Is that right?

Mr. Meyer: That is one of the points.

Mr. Stanley: During what period did that last?

Mr. Meyer: It lasted all summer from some time in the month of May until some time in September, but the difference has continued during the years.

47. Mr. Stanley: To my mind the practical point is: Can you state to us what would be the difference in the production of hydro electric power expressed in horse power, by the proposed structures under your calculations and under the calculations of the Commission's engineers?

Mr. Meyer: So far as the amount of power is concerned, I presume there will be relatively little difference. So far as the cost of that power is concerned, there will be a tremendous difference.

Mr. Stanley: Can you state what will be the horse power?

Mr. Meyer: I am sorry; I finished this work on the train coming over. It is such a tremendous subject and it has only been possible for me to get that in the last few weeks when I saw these differences between your earlier reports and the last report. I have been working on the 1929 and 1930 reports which I have accepted.

Mr. Stanley: You see our point of view. We want to find out the practical results.

Mr. Meyer: Surely, and I say I think we can iron these things out. If the view is that I have been furnished with every-
48. thing I need, then we will have to carry our fight to your Commission; we will have to carry our differences to your Commission, because I am unalterably opposed to the acceptance of these computed natural levels as I have stated.

49. Mr. Stanley: Mr. Chairman, would it be advisable at this time to go into the question upon which Mr. Meyer has made certain suggestions as to the difference between the proposed structures to be erected under present conditions and the dams recommended by Mr. Backus and others previously to this Commission? We have been considering up to this time various projects involving certain costs and the development of a certain amount of hydro-electric power. Now Mr. Meyer says they have abandoned those projects and propose other structures less costly and developing less hydro-electric power. Whether it is important to go into that question at the present time or not while he is on the stand I do not know. If it is we had better take it up now.

Sir William Hearst: I did not understand Mr. Meyer to make any definite statement as to what he felt the development ought to be at the present time. I may have misunderstood him.

Mr. Meyer: You are quite right. What little time I have had has been absorbed in these computations trying to reconcile our differences and my inability to do so. I have not had time to continue the studies of the projects. I did present to your engineers, however, preliminary conclusions for the spring of 1931
50. respecting what we then thought probably would be the projects that we would feel from our viewpoint to be desirable assuming, of course, that those who benefit would have to pay and that we would be among those who would be largely benefited and were willing and are now looking at it from that viewpoint.

Mr. McCumber: Assuming, Mr. Meyer, that you agree entirely with the 1929 and the 1930 reports made by the engineers, could you not supply the Commission with a proposal that you think should be the proper proposal based upon those figures so we could compare that with what they have reported to us?

Mr. Meyer: I would be very glad to do that.

Mr. McCumber: How long would that take?

Mr. Meyer: If we can set aside the results of the re-investigation so far as base data are concerned and accept the data so far as they were published in 1929 and 1930, dependent somewhat upon accessibility of the Receivers and the length of time they will need to consider the matter, I think I can get my conclusions to them inside of three or four weeks easily.

Mr. McCumber: You have already indicated that so far as you are concerned if there is any agreement between you and the engineers it must be a surrender on their part to your views; and if it should happen that they would not surrender their views it might be well for you to furnish the Commission with your views on the assumption that we should follow the 1929 and 1930 reports.

Mr. Meyer: I would be glad to do that.

Major Bullard: Mr. Chairman, I should like to reply to one or two of the points that Mr. Meyer has raised. I can not undertake to and I do not think the Commission would care to have me discuss all of the points considered. I would like to especially emphasize the points that Senator McCumber has just made.

When I first reported to this Commission, in 1928, four years ago, a request was made of Mr. Meyer for a definite plan of what his clients proposed to do. That request has been repeated from time to time. There have no doubt been reasons based on Mr. Meyer's clients or other elements which have prevented or interfered with the establishment of any definite plans on his part; but the fact remains that to date I have received nothing in the way of a definite plan.

Mr. Meyer made reference to a plan which was turned over to me in 1931, I believe he said -- I do not remember the exact time. That plan as presented to me, as I understand it, was an outline of various dams, lake levels and so forth, which it was suggested that the engineers of the Commission could present and could thereby be made subject to discussion. It was not the plan, as I understood it, that Mr. Meyer or his clients were presenting for their own projects.

Now Mr. Meyer says that he disagrees and he implies that we must agree or he will fail to agree with us. However, he believes that the 1929 report is correct. Such being the case, I see no objection to his making a definite plan based on what he believes to be correct and presenting it to the Commission. I believe that we will get very much quicker results if such a plan is presented.

Mr. Meyer: Has suggested that the engineers of the Commission have not placed their cards on the table. I do not remember

that Mr. Meyer has ever placed a single card on the table.

Mr. Bartlett: What cards have you not put on the table?

Has there been any time that you refused him data or information as to what you were doing?

Major Bullard: Detailed computations showing the actual carrying out of methods have not been offered or given to him. The data on which he can reproduce those calculations, the methods by which they were obtained, and the final results have all been made available to him.

53. Mr. Meyer: Mr. Chairman, the inference made by Major Bullard is that I presented in Chicago at our conference a plan for discussion which was not to be our plan. I hold in my hand, "Outline of General Plan for Upper Rainy Improvements. A. Storage Projects. Lac Lacroix: Low Water; High Water; Range; Storage; Approximate Natural Low Water; High Water: Range."

And so on the same information for Basswood, for Crooked, for Saganaga, for Northern Light in Canada, for Sturgeon in Canada.

"B. Power Projects. Location, Crooked Lake: Approximate Head; Approximate Dependable Flow; Approximate Power.

"Lac Lacroix: Approximate Head; Approximate Dependable Flow; Approximate Power."

The same for Sturgeon Lake, Canada. You will note two developments on the boundary. "Type of Regulation Proposed. Our Suggestions. Storage Suggestions. Our Considerations. The Price Of Steam Power Incidental. Figures on Which We Base Our Conclusions Respecting the Advisability of Certain Power Developments. Cost of Clearing. Power Development Suggestions." Four pages.

I consider that that was the gist of our project. I consider it so today. It is up to the Receivers to find time to hear me and consider the matter and pass on it. I am powerless to submit any project until my clients have an opportunity to pass upon the project.

Mr. Bartlett: That was presented by you to whom?

54. Mr. Meyer: To Major Bullard and Mr. Scovil's representative, Mr. Strome, on April 28, 1921.

Mr. Bartlett: Have you any objection to that going into the record?

Mr. Meyer: I have no objection to that going into the record. It was prepared rather hurriedly for their use and information, and I shall be glad to go over it and furnish a copy.

Sir William Hearst: The Secretary of the Commission informs me that there are copies of that on file with the Commission.

Mr. Meyer: I want it understood that this today must be my own and can not be my clients'.

Sir William Hearst: We understand that.

Major Bullard: There is one thing I should like to add. If there is anything that I have said that could be construed as a reflection on Mr. Meyer personally, I would like especially to indicate that such was not my intention. I have the highest regard for Mr. Meyer.

Mr. Meyer. Thank you, and I am sure I do not consider it a personal matter at all. I have been limited by the cards I could put on the table. You people want to know what my clients have to say. Incidentally, you may be interested in my own views.

55. Mr. Bartlett: They did present this to you at that time, Major Bullard, did they?

Major Bullard: Yes.

Mr. Bartlett: Was it of assistance in working out your problems?

Major Bullard: It was of very little assistance because of the reservations with which it was hedged. I was given to understand that it was not any proposition on which the clients of Mr. Meyer would take any stand.

Mr. Bartlett: It was a tentative guide to work by?

Major Bullard: It was a suggestion and that was about all, as I understood it.

Mr. Bartlett: It did no harm?

Major Bullard: No; it did no harm, but it advanced the results practically not at all.

Mr. Stanley: Let me see if I understand you and Mr. Meyer. This memorandum of suggestions as I understand it, contained ideas of the engineer and not concrete, responsible proposals by Mr. Backus or any other power company. Is that right?

56. Major Bullard: I do not remember that any distinction was made at that time as to whether they were definitely Mr. Meyer's ideas or those of his clients or both. I was, however, given clearly to understand that it was by no means a firm proposition, but that it was something that we could present and it would then be subject to discussion and perhaps even criticism by the clients of Mr. Meyer.

Mr. Stanley: Would you state, Mr. Meyer, to what extent this is your proposal and to what extent it is the proposal of your clients?

Mr. Meyer: Mr. Chairman, may I put the situation in this way: At that time your engineers had presented no plan whatsoever respecting storage or power development but had published the physical data from which others could work. We took the maps and the physical data and tried to work out some project that in the light of that information could probably be carried through if the Commission should later on decide on some such project and make a certain charge against my clients.

I discussed these projects at some length and co-operated with the other engineers of my clients and went down to Chicago with this as the best expression of a project that we could make at that time. There are many other studies to be made. These mass curve studies had not been made. Data had not been carried forward. It might be possible that the drought of 1930 and 1931 would produce a low water period in excess of anything we considered in 1917 or that was considered in 1929 or 1930, and that proved to be the case. In other words, there would necessarily be a revision. How could my clients come before your engineers and submit a project to which they would sign their names and say, "We are willing to pay for that thing if you put it through."

57.

Mr. Bartlett. I do not think there is any difference between you in respect to the procedure.

Mr. Rogers: Mr. Chairman, I would like to say just a word on behalf of the Receivers. We naturally must retain someone to advise us as to the technicalities of this matter. The receivership is an operating receivership. We are interested in determining what assets of this company are of value; and it is our understanding that in order to make that determination we must determine to what extent power and storage projects can be developed economically. It is our duty to protect any interests which the companies may have in those power sites for this entire project. On the other hand, it is perfectly safe to say that the matter is being approached from a purely economical angle.

In order to decide the question -- there are many questions involved -- we have asked Mr. Meyer to advise us. The information he gives us is that one very important matter is the matter of what the ordinary high water levels of these lakes would be; that is, in a state of nature. I believe the importance of that question will appear more forcibly when the Assistant Attorney General of the State of Minnesota addresses you, and I believe, as Mr. Meyer suggested, that the Commission's engineers concede the importance, the great importance, of that determination. May I ask Major Bullard if that is not true?

58.

Major Bullard: There is involved in that point a matter of law upon which I am unqualified to speak. I have made in the report a certain assumption with which I know Mr. Wilson will disagree, but upon which I have had some small legal advice, and that is that flowage which has been established prior to the present time and on which there is a presumption that the statute of limitations has run, is now established in the right of the company which has caused the flowage; and that, therefore, those lakes where flowage now exists the amount of damage for such property would apply rather from the established level than from the natural ordinary high water mark. That would tend to reduce to a very small amount, I believe, the economic effect of choosing a plan for development.

On the other hand, if my assumption as to the law is incorrect -- and it may very well be because I am not versed in the law -- the weight of it would be considerably greater. I believe, however, that the determination :

59.

of a definite plan of development need not wait for a decision on the matter. Does that answer your question, Mr. Rogers?

Mr. Rogers: Not exactly. It is my understanding that in 1929 and 1930 certain reports were published containing what has been called certain basic data. It is also my understanding that certain engineers of the Commission subsequent to that time determined that that information, or at least a part of it, was not correct or not of any value; and since then a good deal of time and money have been spent in determining different basic data. I can not conceive of that being done, Major Bullard, by your men or by you unless you considered it to be of great importance. I do not know anything at all about the technical features of this matter; in fact, I had not heard of it until a month ago; but it does seem to me that the matter must be of importance.

60. Secondly, if the matter is of importance it is most assuredly simply an engineering problem. I should be very much surprised if these engineers in conference would not be able to agree upon the main features of their differences. They are engineering problems which this Commission probably expects the engineers to decide and not problems for the Receivers of this Company to decide.

So we have to what little extent we have done anything about it assumed that there would be no dispute as to all computations of basic data, and that the question to be determined would be what projects are feasible, what can be done, in the light of this published information. I believe that is somewhat the position in which the Commission finds itself.

Now, if the change made by the 1932 report as against the 1929 and the 1930 reports is not important, I do not see why we should have to use it. If it is important I should think it would be advisable for us to try to find out just what brings about the difference and try to arrive at some agreement with respect to it.

I might say further that Mr. Backus is not one of the receivers of this company and that, as I stated in the beginning the project will be considered, I believe, by the receivers in much the same way that it would be considered by the Commission; that is, the same purposes will have to control any determination by the receivers. Certainly acting as receivers the attitude towards the plan is impersonal which might be the case with others who have had considerable to do with the entire project.

61. But my entire point is this, that we have a very difficult problem, and it seems now as we are advised by our engineer that it can not be determined, that the whole matter is up in the air; whereas the only thing that should be for determination is the matter of the particular project to be used. I would like very much to see some sort of an attempt made at least to work out some basic data which would be satisfactory to all concerned. If it is not of importance it ought to be very easy to do so; and if it is of importance and no agreement can be reached, then, of course, we should not be asked to agree with conclusions with which we do not in fact agree.

Mr. Magrath: Mr. Scovil, do you wish to say anything?

Mr. Scovil: I will not say anything at the present time, sir.

Mr. Bartlett: You have to leave tonight, do you not?

Mr. Scovil: Yes, sir.

62. Mr. Winston: I should like to make my position here today clear for the sake of the record. Although I represent the Quetico Superior Council, I am not actually representing them because I am not in touch with their work. I am simply here intending to listen rather than actually to represent them. I feel that limitation in discussing this question. I know if further consultations between engineers mean a prolongation of the decision of this question, it will affect the decision of those who believe they represent the public. I cannot say definitely what that will be, but I should apprehend it will probably be one which will not be fortunate to them if this matter has to be delayed longer. Although I cannot speak for the Council, for those who represent the public, it does seem to me if they disagree with the engineers' report, it will be their duty to submit the points of disagreement they have at the time of the hearing, and I do not see how that cannot be done by the proponents of the power project if they in turn pay some attention to what purports to be the final report of the engineers.

63. Mr. Magrath: I hope you all understand that the line the commission was following was to get the most complete data possible and have it available for the public, and then give the public ample time to study it and then give the public ample opportunity to be heard. That is what we have been working forward to, and you are not nearly as anxious to have it disposed of as we are because it has been before us for a very long time.

Sir William Hearst: I do not see how this gentleman's clients would be prejudiced by delay. I thought they wanted it never to happen.

64. Mr. Winston: If there were a perpetual delay, we would be delighted, but it is a very difficult thing for an organization which attempts to represent and express public opinion to carry on indefinitely, and this has dragged on for a long time and it is very hard for us to keep up the interest of the public we represent and also carry on our own work. The representatives of the Council are making studies based upon the reports of the Engineers which they have at present and which they consider to be final. I do not know what effect this change would have. It might not have any. I am apprehensive whether it might in some way impose difficulties on them and I hope, possibly before the commission grants further time for the consideration, that the representatives of the public be given an opportunity to explain what effect it would have upon their side of the case. It may not be possible, but I would hope that might be done.

Mr. Magrath: Do you gentlemen from Minnesota care to be heard now?

Mr. Wilson: That is according to your own wishes. We have a statement of our position which we have prepared. It will take some little time to present it. If the commission prefers to hear it now, we are prepared to go ahead.

Mr. Magrath: If you are prepared to go ahead, we will be pleased to hear you.

Mr. Wilson: We should like to get away tonight if we can.

Mr. Magrath: Then start now.

65. Mr. Wilson: I may say, Mr. Chairman and members of the Commission, as has been indicated by correspondence that took place between Attorney General Benson of Minnesota and the Washington office of the commission, the authorities of the state had not assumed that this meeting of the Commission today would assume the proportions of a hearing. They were advised there would be a preliminary discussion of the matter and that representatives of the state and other parties interested would be welcome with a view to clearing up points with reference to any difficulties which might exist and clarifying the issue, thus expediting the ultimate disposition of this reference in which the state of Minnesota is most vitally concerned.

66. May I say at the outset in order that the commission may get a picture of the state interest that the state has a two-fold interest in these proceedings; first, in its sovereign capacity with respect to the conservation and protection of the rights of the public in the lands and waters affected, respecting navigation, fishing, recreation and other general public uses of those lands and waters; second, in its proprietary capacity with respect to the state lands bordering on those waters. The state owns, according to a rough estimate which we have just made, nearly 12,000 acres of land directly bordering on the Rainy Lake and Namakan reservoirs, which are now under regulation by the existing dams at International Falls and Kettle Falls, of which land something like half has been set aside as state forests. The state has made claims for damages caused by the existing dams to those lands and the timber thereon, which claims are involved in pending lawsuits and also in statements of these claims which were filed with the Commission at its request in 1916 and again, I believe, in 1925, aggregating upwards of \$100,000. The lawsuits for those claims were originally commenced in 1914 and 1916, and the amounts were stated in the claims at an aggregate, I believe, of \$275,000. Those were placed, of course, at outside figures because complete investigations had not then been made. Later at the commission's request, more detailed estimates were filed, and as I have said, those estimates aggregated upwards of \$100,000 for damages caused to the state lands on Rainy Lake and Namakan reservoirs by the existing dams. The state also owns considerable areas on the tributary waters above the Namakan reservoir, practically all of which have been set aside as state forests. These lands and the timber thereon will be affected by any storage project which may be carried out on the upper waters. As I have said, practically all of those lands bordering on the upper waters have been set aside as state forests, and I have also already stated that approximately half of the lands bordering on the existing reservoirs have been set aside as state forests.

Mr. Stanley: That is half the shore line?

67. Mr. Wilson: No, our estimates are based on the acreage, but I assume it would probably amount to half the shore line, not half the shore line of the lakes, but half the shore line of the state lands. I do not know what the proportion is. I asked Major Bullard this morning if the engineers had made any estimate of that,

and he said they had not. That is a matter of detail which can be submitted at a later time when it becomes advisable to go into it.

Mr. Stanley: You do not know roughly what it is?

Mr. Wilson: I do not know, but the state does own a very considerable proportion of the shore line of those existing reservoirs, a much higher proportion than it owns of the shore line of the Lake of the Woods.

Mr. McCumber: These are damages that occur from the Kettle Falls and the International Falls dams?

Mr. Wilson: That is right.

Mr. McCumber: I do not just remember what the laws of the State of Minnesota are, but is there any statute of limitation against these claims that runs against the state itself?

68. Mr. Wilson: I shall have something more to say about that, but it is the claim of the state that the statute does not run against the state lands by reason of the fact that they are administered lands held under federal grant and subject to the state constitution, and our Supreme Court respecting appeals held in a flowage case they are not subject to the application of flowage rights by prescription and they may not be otherwise acquired by adverse process.

Having regard to the fact that the engineers in submitting their final report have suggested that further studies and analyses of the matters covered by the report may be desirable, and for the purpose of facilitating preparation for the final hearings by all parties interested, the State of Minnesota respectfully suggests that each interested party, and also the commission, if it deems proper, indicate its position upon the following matters, to which I shall refer in some detail. I may say that some of these points have already been covered by the discussion that has taken place this morning, as will be seen.

69. 1. Does any party question the correctness of any portion of the physical data set forth in the engineers' report of the conclusions based thereon? If so, to what extent are such data or conclusions questioned, what further investigations or studies should be made with reference thereto, and by what agencies should such investigations or studies be made. It already appears that certain of these basic data are very seriously questioned.

Mr. Rogers: Are they questioned by the state?

Mr. Wilson: Not by the state. I have a statement to make on that; after I have enumerated those questions which we think would be helpful in clarifying the issue, I will state the position of the state upon each of those questions.

2. Do any of the parties interested in the use of boundary waters for power production desire to avail themselves of the plans of regulation and use proposed in the engineers' final report, and if so, are such party or parties prepared to carry out such proposed plans within a reasonable time if permitted to do so?

It has already been indicated tentatively by Mr. Meyer here this morning that the principal proponent of the project is not prepared to avail itself of the proposed plan set forth in the engineers' report, but as Mr. Meyer has said, it remains to be finally determined by the receivers of the Minnesota and Ontario Paper Company what their action will be in that respect.

70. 3. If there is no party ready, able and willing to proceed with one or other of the recommended plans, do any of said parties desire a modified plan for the regulation and use of said waters for power production? If such modified plan is desired, what are the features thereof?

4. If such modified plan is contemplated, are the data contained in the engineers' final report sufficient to answer the questions of the reference as they apply to such modified plan? If the information given in the engineers' report is not sufficient therefor, what further investigations and studies will be necessary, and by what agency should such additional investigations and studies be carried out?

71. 5. Is it contemplated that under question 4 of the reference, that is the question relating to the ascertainment of the cost of the storage from the existing dams and the allocation of the benefits therefrom, the damages suffered by the State of Minnesota and by individual land owners from the past maintenance and operation of the dams at International Falls and Kettle Falls will be determined, regardless of the operation of any statute of limitations, and that a method for the settlement of such damages will be recommended?

The answer to that question is obviously of vital importance to the state in order that the state may determine what action it should take with respect to its own damage claims, and it is likewise of importance to the individual settlers who have claims pending, for reasons that I shall elaborate, with your permission, a little later.

6. Is it contemplated that the regulation of the Rainy Lake reservoir below elevation 1108.61, sea level datum, and the regulation of the Namakan reservoir below 1120.11, sea level datum, will be inquired into and recommendations made with reference thereto, in case no recommendations should be made for regulation of said waters above said levels, respectively? If so, what plan of regulation of said waters is desired by the parties interested therein?

That goes to a matter which has already been the subject of considerable discussion here this morning, and it is a matter in which both the state generally and a large number of its settlers are very vitally concerned.

72. 7. Is it contemplated that under the present reference the feasibility and desirability of having the regulation of Lake of the Woods as well as the waters referred to in the reference brought under the control of a single international body will be inquired into and recommendations made with reference thereto?

That matter has also been referred to incidentally in the course of this morning's discussion. The position of the State of Minnesota, in so far as we are now able to indicate it, upon the foregoing matters is as follows:

1. This relates to the accuracy of the engineers' report. The representatives of the state are not prepared at this time to express any definite opinion as to the correctness or incorrectness of any particular portions of the data or conclusions set forth in the engineers' report.

However, we agree with the other gentlemen who have already discussed that subject this morning that it is vitally important to all concerned that any differences respecting those basic data should be reconciled, if it is at all possible, in order that all parties may have the foundation upon which to proceed.

73. 2. With respect to the readiness of any interested parties to avail themselves of the plans of regulation and use of the boundary waters proposed in the engineers' final report, it is the position of the State of Minnesota that unless someone is prepared to carry out such plans within a reasonable time, it would be a waste of effort on the part of the commission and all parties interested in the reference to prepare for hearings on the proposed plans or to give any further consideration thereto. Obviously it would be a difficult, laborious and expensive task for all of the interests involved to determine how they will be affected by the far-reaching changes in natural conditions which will result if the plans set forth in the engineers' report should be carried out. If no one is ready, willing and able to carry out those plans, they may as well be eliminated from consideration.

74. In this connection the representatives of the state call attention to the fact that the matters involved in the reference have been a subject of public and private concern for over twenty years, and that the reference has been pending before the commission for over seven years, during which a state of uncertainty has existed as to the future disposition of the lands and waters affected. We respectfully urge that in the interests of the public as well as of private parties concerned, both in the United States and Canada, it is desirable that the matter be brought to an early conclusion, and that to that end the questions at issue should be concretely defined and further consideration confined thereto.

3. With respect to any proposed modified plan, if any modified plan is desired, it is the position of the State of Minnesota that the party or parties interested therein should submit a complete and detailed proposal of such modified plan immediately, so that the state and other parties concerned may have sufficient opportunity to determine the effect thereof upon their respective interests and may prepare for final hearings before the commission accordingly. It is obvious that if the various interested parties should prepare for hearings on the assumption that a certain plan is to be considered, and it should later develop that some different plan is desired, much of the time and labour spent on previous preparation will have been wasted, and further delays will result. We therefore suggest that if any modified plans are contemplated, they should be declared at once.

I understand from what Mr. Meyer has said, he will be ready speedily to outline such a plan to his clients and to obtain their determination with respect thereto within a short time.

75. 4. With respect to any additional investigations and studies which may be required in case modified plans are proposed, the question may well be raised whether any further expenditure of public funds therefor would be justified, in view of the large amounts already expended upon the investigations and studies which have been made. However, if modified plans should be proposed, and if the commission should deem them worthy of consideration, the State of Minnesota would submit that any further investigations and studies necessitated thereby should, insofar as the public interest may be affected, be made by the commission's engineers under the direction of the commission with as much dispatch as possible. Other studies and investigations not required for the protection of the public interest should be promptly made by the interested parties at their own expense.

76. 5. With respect to the settlement of past damage claims based upon the maintenance and operation of the existing dams at International Falls and Kettle Falls, it is the position of the State of Minnesota that provision should be made in the course of these proceedings for the determination of the amount of such claims. The state respectfully submits that the commission is authorized and required to make such determination under question 4 of the reference. The state further submits that it would be proper and desirable for the commission to recommend a suitable method for the settlement of such claims after the amount thereof has been ascertained.

In this connection the state respectfully calls attention to certain circumstances and events bearing on the question, and I would ask the commission to indulge me with their patience while I review briefly certain matters which are familiar to certain members of the commission, but perhaps not to those who have become members in later years.

77. In the first place, experience gained in the trial of lawsuits which were brought by individual land owners upon their damage claims demonstrated that the ordinary machinery of the law was inadequate to secure redress under the peculiar and complicated circumstances which existed. In the ordinary course of legal proceedings, each individual land owner would be obliged to obtain and produce in court all the evidence necessary to prove the liability of the operator of the dams for the maintenance of the damaging water levels, in addition to the evidence of the actual damages which he sustained. This process would have to be repeated in each case. Experience showed that the trial of an average case of an individual land owner might be expected to consume two weeks or more in court. The cost of such proceedings to the individual land owners would be all out of proportion to the amounts involved, and in most if not all of the cases the expense would be practically prohibitive. The taxpayers of the county in which the trials were laid would also be subjected to an excessive burden on account of the cost of maintaining the courts and juries.

Ordinarily when such a project is undertaken the proponent either secures the necessary rights and settles damage claims in advance, or, after obtaining the requisite authority, institutes condemnation proceedings, in which his liability is conceded or ascertained once and for all, and an expeditious method is afforded for the determination of the individual claims for damages. Usually it is considered, as a matter of right, that the party who

desires to use the property of others for his own benefit through such an undertaking has the burden of making provision for just compensation in advance. The projects in question, however, did not take that course. The dams were constructed and have been
 78. operated ever since without securing any considerable flowage rights and with no settlement of damage claims except in an insignificant number of cases. No flowage rights were secured on any state lands, nor has the state received any compensation for damages thereto.

Mr. Bartlett: Are the suits pending?

Mr. Wilson: The state lawsuits are still pending and I think a considerable number of the private lawsuits are still pending.

For the most part the injured land owners were left to seek such remedies as the law afforded.

Many of the individual land owners, as well as the state, commenced actions for damages during the years from 1914 to 1917. The state first brought an action in 1914 for \$200,000 damages alleged to have resulted from the dam at International Falls. In 1917 a second action was brought for \$25,000 additional damages alleged to have been caused by the International Falls dam since the commencement of the first action. A third action was brought in 1917 for damages alleged to have been caused by the dams at Kettle Falls. The claims covered by these three actions, aggregating \$275,000, were based on general estimates. Later, as I have
 79. already indicated, after a more careful examination had been made, estimates putting the damages at over \$100,000 were filed with the International Joint Commission.

As has been said, the legal proceedings proved inadequate. The late John E. Samuelson, Esq., attorney for a large number of the private land owners, appeared at the final arguments before this commission on the Lake of the Woods reference at Washington, in 1916, and stated, referring to his previous experience in court, that the inefficacy of the law, with its expense and delays, was such that he did not believe that the settlers would be able to obtain justice through the actions which they had commenced. It is obvious that in the state's cases, involving altogether over four hundred separate parcels of vacant wild land scattered around the shores of a number of different lakes, the difficulties would be vastly greater than in the cases of individual settlers, whose lands were in use and were under more or less constant observation. It seemed that unless some new machinery could be created for investigating and settling the damage claims by practical methods adapted to the situation, both the state and the individual land
 80. owners would be helpless to secure anything like adequate redress.

The first intimation that a solution might be found through proceedings before this commission came from the commission itself at a hearing held on the Lake of the Woods reference at International Falls in September, 1915. Representatives of the state and of the individual settlers having lands on Rainy Lake and tributary waters appeared at that hearing, without any particular expectation that their damage claims would be considered. They were told by the commission that definite information was wanted as to the value of the lands affected by the flowage on Rainy Lake and other upper waters, and were allowed further time for

furnishing such information. Written statements of the claims of the state and of various individual settlers were thereafter filed with the commission, and further hearings were held in the winter of 1916, at which the state officials and the settlers, with their attorneys, appeared and testified in support of their claims. At the final arguments on the Lake of the Woods reference held at Washington in April, 1916, appeared representatives of the state and of the settlers and urged the commission to make some special provision for the settlement of the damages on Rainy Lake and other upper waters, as well as on Lake of the Woods, pointing out the practical impossibility of securing relief in court. Members of the commission then intimated that such provision might be made, but no official action was taken at that time. The final report of the entire commission on the Lake of the Woods reference, filed in 1917, though it dealt with the matter of damage claims on Lake of the Woods, failed to deal with the damage claims or other concrete problems involving Rainy Lake and its tributaries. The American members of the commission made a supplemental report containing more or less detailed recommendations with respect thereto.

81.

Mr. Bartlett: Did the commission assess damages in the case of the Lake of the Woods?

Mr. Wilson: The Commission recommended provision should be made by the United States government for ascertaining all those damages, and provision has been made and it is now being carried out.

Mr. Bartlett: By what agency?

Mr. Wilson: The War Department, I believe, was directed to ascertain the damages, and the government also instituted condemnatory proceedings for the acquisition of the necessary flowage rights, for which appropriations have been made. I believe so far no appropriations have yet been made for the payment of the past damages, but it is expected that some day, after they have been ascertained, such appropriation will be made by Congress.

82.

Mr. McCumber: What is the cause of the delay? Why has Congress not made the appropriation?

Mr. Wilson: I think Major Bullard could explain that better than I can. I think he is more familiar with it.

Mr. McCumber: I do not want to interfere with your line of argument at all.

Mr. Wilson: I have appeared as counsel for the state in the condemnatory proceedings, but we were interested primarily in the matter of flowage rights and have not taken any active part respecting damage claims.

Mr. McCumber: I will not press the question.

Mr. Bartlett: The point is the United States government assumed the damages.

83. Mr. Wilson: That was done pursuant to the treaty respecting the Lake of the Woods. Canada forwarded the United States a certain sum of money under that treaty and under its agreement with the United States was to assume the responsibility for securing flowage rights and settling damage claims.

Mr. Bartlett: Are suits pending against this corporation?

Mr. Wilson: Yes. On Rainy Lake it is different. On the Lake of the Woods the government brought blanket condemnatory proceedings in which all appeared and submitted proof of their claims without the necessity of proving liability for the damage levels which was admitted in advance.

Mr. Bartlett: But these suits you speak of now?

Mr. Wilson: Those were brought against the Minnesota and Ontario Power Company, which by change of name has become the Minnesota and Ontario Paper Company, the association now in receivership which is responsible for the operation of the existing dams.

Mr. Bartlett: Were they trespass suits?

84. Mr. Wilson: They were damage suits. They were not brought exactly for trespass or ejectment, but they were damage suits for the results of the overflow which occurred from the dam at International Falls up to the year 1914. That damage was covered by the first bunch of suits that were brought. Later, in 1917, the state brought another suit for further damages caused by the dam at International Falls. In the meantime the dam at Kettle Falls had gone into operation, and in the same year, the spring of 1917, the state brought a suit for damages to its land on Namakan caused by that dam.

Mr. Bartlett: Are they still pending?

Mr. Wilson: They are still pending, for reasons I shall discuss.

Mr. Bartlett: In what court?

Mr. Wilson; In the district court.

Mr. Bartlett: Did they try injunction proceedings?

Mr. Wilson: No, I shall have something to say about that.

Mr. McCumber: The government condemned the lands for the Lake of the Woods.

Mr. Wilson; That is pursuant to the treaty.

Mr. McCumber: And under that treaty the government of the United States were to pay for those lands to the owners?

Mr. Wilson: Yes, after having received a sum of money from Canada.

85. Mr. McCumber: And all these years have passed and the Government has not appropriated the money to do it?

Mr. Wilson: Appropriations have been made for payment for the future flowage but not for the past damage claims which amount to something in addition to the flowage. That is, the various settlers on the Lake of the Woods claimed that since the government undertook the responsibility for this flowage, their lands have been damaged from time to time in various respects. They have lost the use of their lands and their crops have been flooded or they have been prevented from cultivating their land, and they are entitled to temporary damages by reason of those dams, and they are also entitled to permanent compensation for damage to flowage rights over their lands, which is being taken care of in compensation proceedings.

Mr. Bartlett: Did Canada pay the money to somebody?

Mr. Wilson: I believe Canada paid the money to the United States. I believe it was provided Canada should pay something over \$300,000.

Mr. Bartlett: And the United States has not made the distribution yet?

86. Mr. Wilson: It is all appropriated in case the courts should decide in certain cases Canada should pay certain sums. That was by reason of the fact the power development on the Lake of the Woods was entirely in Canada.

Mr. Bartlett: And the American Congress has not done its part?

Mr. Wilson: I am not in a position to state that, because I do not know what the total amount has aggregated, nor would I assume to say what the liability on the part of the American government would be.

87. Major Bullard: Since the question has been raised I think it might be disposed of. The appropriation that Mr. Wilson has indicated has been made and is being disbursed to pay for the easement, the right to continue the flowage in the future on the Lake of the Woods. The report on the past damage claims recommending payment, under certain conditions, of some seventy-odd thousand dollars was submitted to the last Congress, and I believe was passed over due to press of other work.

Mr. Bartlett: Has the United States got the Canadian money? Were they to share equally?

Major Bullard: In the matter of flowage easement Canada undertook to pay, and has paid, to the United States some \$275,000, with an additional undertaking to pay half of anything over that amount. The United States has appropriated \$375,000 to put to that \$275,000, and that amount is now being disbursed.

Mr. Wilson: I think I have stated, referring to the fact that the report of the Lake of the Woods Reference failed to deal with the questions forming the Rainy Lake upper waters, that the American members made another report containing more or less detailed recommendations with respect to those waters above the Lake of the Woods.

88. Thereafter the representatives of the state and of the settlers continued their efforts to secure some provision for the settlement of their damage claims through proceedings before the Commission, believing that as long as there was any prospect of getting action in that way it was better to work for that end, suspending proceedings in the law suits in the meantime.

The power interests operating the dams in question also worked for the submission of the matter to the Commission and consented to the continuance of the law suits. Those interests have never attempted either to bring the court actions on for trial or to secure a dismissal thereof, but on the contrary have both expressly and tacitly acquiesced in keeping the suits in a state of suspense, pending the determination of these proceedings before the Commission.

In the meantime, during all the years that have elapsed since the dams were constructed, the power interests have had the benefit of using without compensation the shore lands of the state and of the private land owners for water storage and power purposes from time to time as occasion required. In effect, the power interests have repeatedly, though not continuously, trespassed upon these lands and have appropriated them to their own use without authority of law whenever it served their purposes to do so.

89. The power interests may and doubtless will, as has been indicated here this morning, contend that they have had lawful authority from the governments of the United States and Canada to maintain and operate the dams. They claim the right, under such authorization, to raise the levels of the Rainy Lake reservoir and the Namakan reservoir to the elevations specified in the reference, 1108.61 and 1120.11, respectively. The state answers that in so far as these levels are above the natural ordinary high water marks, as they appear to be from the engineer's report and from evidence gathered by the state such governmental authorization

was illegal and void. The state further contends in this connection that the authority of the United States government to regulate the water levels up to the ordinary natural high water marks was limited to regulation for navigation and other related public uses, and that the government had no power to authorize private interests to interfere with the natural level and flow of the waters for any other purpose in such manner as to injure state or private property. Nevertheless, as I have said, the power interests have assumed to control the waters in question for their own benefit under the guise of governmental authority, without any adequate provision for determining the rights of property owners affected or for serving the general interests of the public in the waters.

90. That such an astonishing situation has been permitted to exist for so many years can only be explained by the fact that the state and the private land owners concerned were led to believe that the whole matter would be settled within a comparatively short time through the proceedings before the Commission. It was not anticipated that so long a period as has now elapsed would be required.

The engineers in their report have assumed, for the purpose of determining the cost of the existing storage in the Rainy Lake and Namakan reservoirs, that necessary flowage rights have been acquired by prescription, and inferentially, that damage claims have outlawed, except as to those land owners who have kept their rights alive by the maintenance of actions at law. The State of Minnesota respectfully submits that this assumption is at least questionable in the matter of law, and that in any event it was beyond the province of the engineers to make such an assumption, in the absence of an authoritative determination by the courts.

91. The State further says that certain land owners have lost their rights by prescription or limitation; but provision should, nevertheless, be made for the determination and payment of damages to all who would legally have been entitled thereto but for the operation of the statutes of limitation, in view of the peculiar and complicated circumstances of this case as hereinbefore outlined.

In this connection the State does not assume to suggest that the method used in settling the Lake of the Woods claims or any other particular method should be recommended or followed in the present matter. The State does, however, most strongly urge that in view of the altogether unusual circumstances which have been pointed out and in consideration of the long period of uncompensated use of the waters in question which the power interests have enjoyed, and of such further use of the waters as may hereafter be lawfully permitted, those interests should be required to make just and equitable settlement of all damages to which the land owners would lawfully have been entitled, regardless of the operation of any statutes of limitation.

In this connection the Attorney General of Minnesota desires to make it clear that he has no authority to act for any private land owner in the prosecution of his claim, and he assumes no such authority. However, he deems it within his province as the legal representative of the State to make the foregoing representations in behalf of the State and of all its

92. citizens who may be affected by the matters in question.

6. With respect to the regulation of the Rainy Lake Reservoir and the Namakan reservoir below the elevations specified in the Reference, 1108.61 and 1120.11, respectively, it is the position of the State that such regulation is necessarily involved with the determination of the questions of the Reference respecting those waters, and that if further regulation of those waters below those levels by means of the existing dams is to go on, such regulation should be inquired into and recommendations made with reference thereto, regardless of what action may be taken with respect to higher levels.

As already pointed out, the State contends that the past regulation of the waters controlled by the existing dams under the guise of governmental authority has been without legal sanction in so far as the waters have been raised by the dams to any extent above the natural ordinary high water marks. The State further contends that in so far as the dams have interfered with the natural level and flow of the waters below the ordinary natural high water marks, such interference, to the extent that it may have injured state or private property, has been illegal except in so far as it may have been undertaken with proper governmental authority for the benefit of navigation or other public uses of the waters.

93. In that connection, I may say, in answer to the question that Major Bullard raised, that we deem it to be the fundamental law in Minnesota and in most of the States of the Union, recognized by the Supreme Court of the United States, that the public waters belong to the States. At least such is the law in the State of Minnesota; and the fact that such is the law in that State has been expressly recognized by the Supreme Court of the United States; and that the right of the Government to control to any extent public navigable waters is limited to control for purposes of navigation and other recognized public uses. And we contend that the Government has no authority to authorize any private corporation or individual to interfere with the natural level or flow of public waters even below the ordinary high water mark in such manner as to injure property.

Mr. Bartlett: Was any considerable part of the land that was overflowed tillable land that was really valuable?

Mr. Wilson: Not on Namakan Lake. There was considerable damage to land on Rat Root River, and there was very extensive damage to valuable hay meadows.

Mr. Bartlett: Where were they?

94. Mr. Wilson: They were both on the Rat Root River and on Kabetogama Lake. The Rat Root River runs into Black Bay, which is an arm of Rainy Lake, and Kabetogama Lake runs into Namakan Lake. There were very extensive hay meadows on which valuable crops of wild hay had been cut for years which has been practically destroyed.

Mr. Bartlett: Are there any suits pending by the land owners around the shores of Rainy Lake itself where they may have flooded near residences, buildings, or factories?

Mr. Wilson: I think there are some.

Mr. Bartlett: Were there any suits brought in Canada?

Mr. Wilson: There were some suits brought in Canada, but as to the disposition of all of them I have no definite information. I know there were some suits brought in Canada but as to how many I cannot say.

Mr. Bartlett: I had not thought that the question of damage was before this Commission. Do you think it is under the present Reference?

95. Mr. Wilson: That is our contention for the reasons which I am indicating. Question 4 of the Reference directs the Commission to ascertain the cost of additional storage and what interests are benefited thereby. We deem the matter of damage to be inherently involved in that question of the Reference. But there are a few further considerations which I can dispose of now within a few minutes if the Commission wishes to hear this further.

We call attention to some further considerations in respect to the operation of these existing dams, and that is that the operation of these dams, without supervision by any international body constituted to secure proper recognition of the interests of the public and of the rights of property owners, has been highly unsatisfactory. As Major Bullard has indicated already, very little attention has been paid to that by the United States authorities. These additional considerations support the position of the State as already indicated on this point.

7. With respect to bringing the regulation of Lake of the Woods and the waters mentioned in the present Reference under the control of a single body, it is the position of the State of Minnesota that since the level of Lake of the Woods must necessarily be materially affected by any regulation of Rainy Lake or other tributary waters, the regulation of the entire chain of waters of the Lake of the Woods watershed, in so far as such regulation may be lawfully authorized, should be brought under unified control.

96. 8. The Attorney General of Minnesota desires to say that he has no authority to determine the policy of the State with respect to the regulation or use of the waters in question for navigation or for power purposes or for any other purposes, and that no statement herein made on his part should be construed as indicating the position of the State either for or against such regulation or use. Authority to determine the policy of the State with respect to those matters is vested in the state legislature and in the Department of Conservation, whose representatives are here.

Mr. Bartlett: Do you not think that they should be declared by this time?

Mr. Wilson: I may finish by saying that that is subject to the provisions of the State Constitution. In respect to their declaring their policy, I might say, in view of the fact that the engineers' report has been completed in the interim between sessions of the legislature, the legislature could not very well have declared its policy, and, inasmuch as this Department of Conservation was newly created by the legislature, it could not very well have declared a policy. Before this Department of Conservation was

97. created and vested with jurisdiction over lands, waters, timber and minerals of the State we had no body which had authority to declare policies of the State except the legislature or the people through the Constitution; and on account of the fact that the engineers' report has only recently been filed, there has not been opportunity for such declaration.

It is the position of the Attorney General that as soon as the issues involved in the Reference have been defined and the basic facts pertinent thereto have been determined, he will submit them to the Department of Conservation, and also, if necessary, to the State legislature, in order to enable them to take such action as they deem proper with respect to the policy of the State upon the questions of the Reference. The International Joint Commission will be duly advised of any action which may be taken in the matter by the Conservation Department or by the State legislature.

Mr. Bartlett: Does the Federal Act declare a policy with respect to this whole matter?

Mr. Wilson: The Shipstead-Newton-Nolan Bill, to some extent, declares a policy by providing that the waters bordering on the lands of the Superior National Forest shall not be interfered with in any way without the consent of Congress, except certain small lakes which are not involved in this Reference. So to that extent Congress has declared its position in the matter.

98. Mr. Bartlett: And your position would not be contrary to that?

Mr. Wilson: Our position would not be contrary to that, no, sir; in fact, the legislature of the State of Minnesota by resolution adopted, I think, at the 1929 session memorialized Congress to pass the Shipstead-Newton-Nolan Bill. To that extent the legislature has gone on record to the effect that the waters of the Superior National Forest, which includes a considerable part of the waters here in question, should not be interfered with without the consent of the United States.

9. Regardless of what may be officially determined as the policy of the State with respect to the questions of the reference, the Attorney General of Minnesota deems it his duty to maintain all legal rights of the State which may be involved, both with respect to the State's claims for damages to its lands and with respect to the general rights of the public in the conservation and use of the waters in question and the state lands and forests bordering thereon.

99. In this connection the Attorney General calls attention to the fact that the state lands affected are trust lands, including school lands, swamp lands, and forest lands, held under the provisions of the State Constitution, and that no rights or interests therein can be acquired by prescription or adverse possession, and that the acquisition of such lands or of flowage rights or other interests therein is controlled by the provisions of the Constitution and statutes of the State.

We further call attention to the fact that a considerable portion of the lands has been set aside as state forest under the provisions of the State Constitution, and withdrawn from sale.

The Attorney General deems it his duty to insist that no state lands be overflowed for any purpose, either by the existing dams or by any dams which may hereafter be constructed, unless lawful authority therefor be obtained.

He further deems it his duty to insist that the natural level and flow of the waters in question be not interfered with by the existing dams or by any dams which may hereafter be constructed in any manner that will injuriously affect the public interests or property rights unless lawful authority therefor be obtained.

I think that covers the position of the State so far as we are able to indicate it at this time. If there are any questions we should be glad to answer them.

100. I may say that Mr. Willard, who is Director of the Division of Drainage and Waters of the Department of Conservation of the State of Minnesota, is here representing Mr. Cox, the head of that department, as I have previously stated, and he would like to make a statement as to the attitude of that department. The Attorney General, of course, is not only the legal representative of this State but is also counsel for that department, and he will act for it in case it requires any legal counsel or services; but, insofar as the policy of the department is concerned, the Attorney General has nothing to do with that and I shall leave it to Mr. Willard to make such statements as he has been authorized to make on that subject. May I say also that the representatives of the State appreciate very much the consideration which has been given us here by the Commission.

(Thereupon, at 1:10 o'clock p.m. a recess was taken until 2:15 o'clock p.m.)

A F T E R R E C E S S

The Commission reconvened at the expiration of the recess, at 2:15 o'clock, p.m., Mr. Magrath presiding.

Mr. Magrath: Gentlemen, Mr. Winston wishes to say a few words which he omitted to say this morning.

Mr. Winston: I simply want to state to the Commission the program which the Quetico-Superior Council and those organizations which are associated with it propose as an alternative to the power program.

101. In the first place, the Quetico-Superior Council sees the Superior National Forest Park in the State of Minnesota as the only remaining land for the purposes suggested. Even in the Middlewest, which is in a comparative state of nature, it has been logged to a certain extent it is true, but still it is a beautiful country. As I say, it is the last piece we have in Minnesota, if not in the whole country, and converting it into power purposes would to our minds mean the spoliation of the country. We propose, with the consent of Canada, a treaty be instituted which will set aside the Superior Forest and as much of the Quetico Park as the Dominion of Canada may see fit to grant as an international forest, similar regulations being in

effect governing both areas, the primary purpose of this international forest to be the protection of timber, providing that the cutting be done in such manner as to impair the beauty as little as possible. In so far as power development would interfere with that, we are opposed to it. The American Legion and the Canadian Legion in endorsing that program have suggested, if it is possible, to create this international forest to be dedicated to the memory of the two armies that served together in the war.

Mr. Magrath: Now, Mr. Willard, are you ready to go ahead?

102. Mr. Willard: Mr. Chairman and members of the Commission, after what Mr. Wilson said about the Conservation Commission of Minnesota I do not see that there is any need for me to go into the subject matter.

Prior to the session of the legislature of 1931 there was no department of state within the state government which had been given jurisdiction over the use, regulation and conservation of public waters. There is no department now specifically delegated to do that, but the legislature of 1931 created a Department of Conservation which has taken over the Department of Forestry, Department of Drainage and Waters, and the Department of Game and Fish. They are formulating a program to be presented to the next legislature, and it is hoped that within that program will be encompassed the right to establish a state policy with reference to the use of public waters.

103. Mr. Cox, the Commissioner of Conservation, wanted me to state to you that he himself and the members of the Commission of Conservation are keenly interested in the disposition of the problem that you have here today. They are not only concerned with the utilization for industry of powers where they appear to be of an outstanding practical value, but they are much more interested in representing the general public in the use of these waters.

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I think he would also want me to express to you his heartfelt appreciation of the attention which the Commission has given to this problem. With that I have nothing further to say.

Mr. Magrath: Thank you, Mr. Willard. Is there anyone else that wishes to be heard?

Mr. Johnston: All I wish to say, Mr. Chairman, is that there are quite a large number of interests on the Canadian side of the border that are affected by these questions before the Commission, and we have been taking preliminary steps to coordinate our ideas and prepare for a final hearing.

These interests are diverse and may be grouped under three heads. For the Dominion, the Dominion will be more or less responsible for representations having to do with international waterway matters or international waterway responsibilities. The Department of Indian Reserves is also interested inasmuch as there are several Indian reserves located on the lakes in question. The Canadian National Railway will also be affected by the questions and will make representations. The Dominion fishing interests will make representations, and, of course, the navigation interests.

These all come within the compass of the Dominion jurisdiction.

104. In Ontario the Province will be interested from the point of view of the power interests located in the Province, and these will be rather involved inasmuch as there are powers above the Lake of the Woods and below the Lake of the Woods.

Then, there are the timber interests for which the Province of Ontario is responsible. These will involve the lumbering interests and the departmental policy with respect to clearing and forestry and such other matters as come within the compass of the Province. There are the Ontario fishing interests which will involve the parks, and so forth. All of these fall within the compass of the Ontario jurisdiction.

Then there will be the group which might be termed the Manitoba interests. These have to do largely with power and consist of the undeveloped power sites on the Winnipeg and the developed power sites.

These Canadian interests are giving their consideration to the problem now and to the report of the engineers and will be prepared in due course to present their views to the Commission upon the occasion of the next hearing or whatever the Commission may decide is the proper procedure.

105. But the interests are diverse and the problem is complicated. We do not wish to be hurried too rapidly into a final consideration. Important points have been raised this morning as to basic data. We have been going ahead on the basis of the final report. I think some ruling should be given by the Commission as to what data we should follow in order that all final representations that come before the Commission will be from the same fundamental material.

With regard to the Canadian interests I might say that we would not care to be hurried into a final decision for some months. It is a complicated problem and can only be analyzed slowly and carefully. At the present hearing we have no representations to make; we are simply forming our ideas and getting ready to present our final briefs.

Mr. Magrath: But you are actively engaged in getting ready, are you?

Mr. Johnston: Absolutely. We have no difficulties before us. We are simply proceeding with the basic data that we have been furnished with and analyzing it with respect to all of the interests concerned.

Mr. Stanley: As I understand you, you will have to determine which is the authoritative data?

Mr. Johnston: We have simply gone ahead on the basis of the last reports.

106. Sir William Hearst: I understand that you are assuming that the 1932 data are correct?

Mr. Johnston: Yes; but I think there should be a ruling

given so we can all approach this from the same basic data.

Mr. Magrath: Is there anyone else that wishes to be heard?

Major Bullard: Professor Wisler has called my attention to the discussion of the correctness or incorrectness of the basic data. I do not think there is any question as to the accuracy of the basic data. The point brought up is not as to basic data; it is as to computations based on those data. The basic observed physical data are published in the reports. In addition to the reports there are certain other computations. They were included, in part, in the original reports with the statement that it was thought that those computations would not have to be revised. That understanding had to be itself revised. The basic data were not modified but the conclusion therefrom which anybody is welcome to make was modified.

Mr. Stanley: Major Bullard, as I understand it, the engineers of both countries are practically agreed on the essentials of these basic data for 1932?

Major Bullard: I think so.

107. Mr. Scovil: I might state in that respect, sir, that results of storage and regulation show about the same effect but not the results of natural levels; they do not.

Sir William Hearst: I did not catch that last statement.

Mr. Scovil: Not the results of producing natural levels on the various controlled lakes, they do not show the same; but in so far as storage and regulated flow are concerned they do. Furthermore, as I have pointed out to the Commission previously and as Mr. Meyer pointed out today, the possible regulated flows are based on extreme low water conditions. We have not as yet come to an extreme low water condition which may modify all results.

As to individual benefits, inevitably they will be the same, but we do not know what we can get out of that storage and that watershed at the present time under extreme low water conditions, and we are still in that period.

In the period since, let us say, 1912, when more or less accurate records were being kept we have had two or three low periods of runoff which govern what may be secured in the way of regulated flow. We are now in a very prolonged period of extreme low runoff, and we do not know what the result of this may be. It may modify everything. So that is the situation as I see it.

108. I might still further make this statement, that while we have had certain disagreements over data or the computations, in the end, so far as storage and benefits from storage are concerned, they have given almost identical results, but I do not nor can I agree with the deductions as to natural levels.

Sir William Hearst: The deductions that are embodied in the report of 1932?

Mr. Scovil: Yes, sir.

Mr. Bartlett: Are those deductions in the report of 1932 made from physical facts where you can measure, and so forth? Are they made from facts which are agreed upon?

Mr. Scovil: Let me put it in this way, sir: There are certain physical facts; Mr. Meyer now has certain physical facts which we did not have available.

Mr. Bartlett: Give me an illustration of what that means; what kind of physical facts?

Mr. Scovil: Particularly in flood stage.

Mr. Bartlett: What kind of physical facts, I mean?

Mr. Scovil: Actual records of water flows.

Mr. Bartlett: Before the dam was built, do you mean?

109. Mr. Scovil: Before and afterward, both. This whole question of Rainy Lake and Rainy Lake records has been somewhat a question of controversy at times. In my own opinion I believe the records are entirely within a reasonable limit of accuracy. When I say a reasonable limit of accuracy I mean that they are records on which any company -- I am not talking now about a government in this connection, but a company intending or proposing power development and a scheme of development throughout contingent upon that would, at the proper analysis, rely upon it.

I am not altogether without experience in this. Since I left college I have specialized in such work; and so far as Canada is concerned, or the United States, I have been engaged since 1925 by three of the largest power companies reporting entirely on similar projects; for the United States the International Paper Company, reporting both in Canada and Newfoundland; and so far as Canada is concerned both the Gatineau Power Company and the Beauharnois, Light, Heat and Power Company and the Montreal Light Heat and Power Company. I feel and know that I have some knowledge of the subject.

110. In the last analysis I never felt, as I have told the Commission, that there was any reason to modify our preliminary reports of 1929 and 1930. I still feel that while there may be differences in some of the individual computations that may bring in slight differences, yet they are not of such percentage that they affect the final results at all. In so far as regulated flow is concerned, coming back to natural levels, I do believe there is an effect.

Sir William Hearst: Well, are the natural levels an important element in the report?

Mr. Scovil: They are, sir. In dealing with the boundary waters, down to Rainy Lake and dealing with the Lake of the Woods one must start with the natural levels or deduce natural levels. What outflow is there in the state of nature? Then after that by providing so many feet of storage on different lakes what the outflow may be under regulated conditions, and then it is the increase of regulated outflow over natural that shows the benefit.

Mr. Bartlett: There is a distinction between natural

flow as observed and recorded by marks perhaps on shore. That would be what you would call definite ascertainment of natural flow before a dam was built, would it not? That is, if you find where the marks were on trees or rocks. Is there in this case some record, or records, however incomplete, existing prior to the building of the dam?

Mr. Scovil: There are records in this respect of the relation between lake stage and outflow under natural conditions. So that using them one may derive what the natural level would have been in subsequent years.

111. Mr. Bartlett: There is probably no difference between Major Bullard and Mr. Meyer as to the record of physical markings prior to the building of the dam, is there?

Mr. Scovil: It is not so much a question of physical markings, sir, as a record of water levels taken at certain periods; take at Rainy Lake above and below the falls.

Mr. Bartlett: There are some records of physical markings of the height of the water in its natural state prior to the building of the dams, are there?

Mr. Scovil: Yes.

Mr. Bartlett: Do I understand that there is any dispute as to the accuracy of those records?

Mr. Scovil: No.

Mr. Bartlett: There is no way to dispute them, is there?

Mr. Scovil: No. The trouble, if any, comes about through the relationship between lake stage and outflow in the higher stages.

Mr. Bartlett: Now, let me see if I understand it. Taking these markings prior to the building of the dam, are there some records of elevations prior to the building of the dam?

Mr. Scovil: Yes.

112. Mr. Bartlett: Taking those into consideration, does the difference between these two sets of engineers arise because of the conclusions to which they come based on those known facts?

Mr. Scovil: These records cover only a certain range in lake elevation and outflow. They do not go to extreme flood stage.

Mr. Bartlett: And that has to be computed?

Mr. Scovil: That has been questioned.

Mr. Bartlett: That is what you mean when you talk about curves, is it not?

Mr. Scovil: Yes, sir.

Mr. Bartlett: That is a projection of known facts in relation to a theoretical conclusion based on those facts?

Mr. Scovil: Yes, sir!

Mr. Bartlett: So really the difference between them is a computation or a conclusion difference, is it?

Mr. Scovil: Yes, sir.

Mr. Bartlett: If they got together could they within an hour or a day or as long as they want exchange ideas and level those differences, do you think?

Mr. Scovil: I believe it could be done. That is my opinion.

113. Mr. Bartlett: You think they could convince each other like two school teachers who had different notions at first; that they would not have to change any records or measurements or angles?

Mr. Scovil: Conclusions derived from deductions beyond the limit of observed flows and elevations.

Mr. Bartlett: Major Bullard, is that about the way you understand it?

Major Bullard: Yes, sir.

Mr. Bartlett: Do you get that same notion, Mr. Meyer?

Mr. Meyer: Correct, sir.

Mr. Bartlett: Of course, we are all willing that you should do that and we want you to have time enough to do it. Is not that right, Sir William?

Sir William Hearst: Quite right.

Mr. Meyer: May I say that this morning I did not mean to indicate that our minds were closed, that we were asking that the other side come over to ours. But I say if it is intimated that we have been presented with everything that the other people have to present to us, then I say we are unalterably opposed to these conclusions. We are ready to present our facts, and if they will present their computations and their facts that we have asked for, we are in an open mind to consider the matter.

114. Mr. Bartlett: Would it not be a good idea that as you are all here together you stick around for a day or two to see what you can do?

Mr. Meyer: I would be very glad to do anything I can.

115. Major Lyman: I have just recently come into this case. I have with me today Professor Wisler who has been on similar cases at different times, and I should like to introduce him. I should like to have him have the opportunity of asking Mr. Scovil a few questions which might help us in clarifying this difference.

Professor Wisler: If I may presume, there are just two questions that I should like to ask Mr. Scovil. In the first place I should like to ask Mr. Scovil what he considers to be the ordinary high water level of Rainy Lake. Second, I should like to ask whether he agrees with the method and with the results

that were used in obtaining the natural high water levels as they were deduced in the preliminary report.

Mr. Scovil: I cannot give you the ordinary high water level of Rainy Lake at the present time. I have no figures with me. But as I remember the preliminary report, the June elevation was used, I think.

Mr. Strome: The average of June, July, August, September.

116. Mr. Scovil: In that respect and deducing the average high water elevation of Rainy Lake, it was entirely in accord with the Lake of the Woods report to which the engineers of both Canada and the United States, not only the commission engineers but all others interested, agreed in formal conference in Winnipeg, and came before the commission and they accepted not only the methods formally but the conclusions arrived at.

Professor Wisler: What was that?

Mr. Scovil: I have not the figures at my finger tips at the present time.

117. Mr. Meyer: So far as my statement or argument this morning was concerned, it was not the average level on Namakan Lake or Lake of the Woods as previously published. I respectfully consider the question of the high water mark on a different lake might be a subject of consideration to which I do not entirely subscribe. I did not know the report had a statement of the ordinary high water level on Rainy Lake. I am not at the moment apprised of the fact. I referred to the computed natural levels. We agreed with those. On one lake you may find in the months of May, June, July and August, the high water marks. If you find on a certain lake the month of May is a high water mark and higher than July or August or September. I would not say it necessarily follows that you can omit the high water mark of May and add the last month of September and then determine the ordinary high water mark.

Mr. Bartlett: I think something might be gained if you gentlemen could get together between now and all day tomorrow and come in Thursday morning and tell us you have made some headway in adjusting your differences. Do you think so?

Mr. Meyer: I really believe so. I think through some inadvertence the observations we made during 1916 and which are matters of record in the offices of both commissioners, amounting to several feet higher, did not come to the attention of the commission's engineers, and I believe I am right in saying Mr. Scovil did not know they existed until I referred to them this morning. Is that correct?

Mr. Scovil: Correct.

118. Mr. Meyer: From the material we used while these matters were in discussion, Mr. White, Mr. Starr, Mr. Shepherd and my assistant satisfied themselves our curves were correct. Naturally we do not publish information to show what we had believed then was correct. Those curves were not published. The data are in the files and it is unfortunate these gentlemen did not happen to come across them. I knew they were the best I could prepare and they were made for the specific purpose of checking those compu-

tations of natural levels. I believe, when these gentlemen get those figures and we get together with them across the table, we can reach a conclusion. I would like to see their calculations. I would like to refer again to my letter where I said I would like to have those calculations leading up to their conclusions as to this curve. The answer came back that those were not among the records the commission had authorized the office to release, and I stand on that position.

Mr. Bartlett: I suggest, unless somebody has something more to say before the commission, that inasmuch as Mr. Scovil is going away tomorrow, perhaps they could get some advantage by having the rest of the afternoon with him in the office where they can dig out some records. I think it would be good judgment to let them go to work on it.

Mr. Burpee: There are several large boxes of records of the Lake of the Woods downstairs.

119. Mr. Wilson: Before the subject is dropped, may I ask a question concerning the statement that Mr. Scovil made and that is the fact that we have been going through a long series of unusual water levels might change the complexion of the entire proposition, or words to that effect. I should like to inquire whether Mr. Scovil meant to intimate by that that the ultimate disposition of this reference is to be delayed until the effect which he has in mind can be determined, and in that connection I want to state most emphatically that the State of Minnesota renews its insistence that the proceedings be pushed to a conclusion as rapidly as possible upon the data which have already been gathered, assuming that these differences that have been referred to can be reconciled. But I should like to ask Mr. Scovil whether he intended to intimate that any further delay would be necessary on account of the statement which he made.

120. Mr. Scovil: There is no reason for any delay. The benefits that may be derived from storage as shown from the past low periods or the present low period, out of which we are not yet and as regards which we do not know how long it may last, will give a sufficient answer that if in any particular lake where a storage is proposed, the costs, even with possible present apparent benefits, are so close to the mark that it does not appear economic, it would hardly appear that they would be proceeded with. But in other cases where the economic factor is taken into account on past low periods where they may be close and the present is still worse, then they are out of the question entirely. There is no reason for delay. As to apportionment of benefits, that is entirely relative, a direct ratio from one power site to another.

Mr. Wilson: Thank you. May I ask further whether there could be any indication today of just what the future proceedings from now on will be and what time may be allowed for the engineers getting together as has been suggested and for the submission by the power interests of their plans if any modified plans are to be submitted. In that connection the state would like to have as much of a definite indication as can be arrived at. We are particularly interested in having these differences reconciled, the basic data established and the plans upon which the proceedings are to go forward submitted before the next legislature meets, which will be the fore part of next January, so that in submitting

121. to the legislature the water control policy of the Conservation Commission to which Mr. Willard referred, they will be able to take those things into consideration. Otherwise another meeting of our legislature, which occurs only once in two years, may come and go without any definite declaration of the policy of the State of Minnesota on the broad general question of the use of these waters.

Mr. Bartlett: Would it not be possible for the legislature to empower somebody to shape the policy as events develop?

Mr. Wilson: Yes, the legislature might, subject to constitutional provisions, empower the Conservation Commission to do that, but I am sure, through your own legislative experience, Governor, you realize legislatures like to have a lot of information about details and particulars, because they vest such extensive powers in any subordinate bodies, so that it is highly desirable that the matter be put in as definite shape as possible before the meeting of our legislature next January. We do not mean that there should be a final hearing before that date, but that these preliminary steps which are necessary in order to clarify the issue should be pushed to completion some time this fall before our legislature meets in order to put us in a position to submit the matter properly to the legislature.

122. Mr. Bartlett: I wonder what sort of programme this would be -- we are pretty nearly through with what we can do now -- for those interested in this engineering problem on both sides of the theory to get together as soon as they can and work as fast as they can and develop this matter, and for the two chairmen to keep track of them and for them to keep us informed, so that just as soon as they get anywhere we will try to agree upon a date for a hearing. If we set it now arbitrarily, it might not be so wise. I would be inclined to make that suggestion, Mr. Chairman.

Mr. Magrath: That falls within the wishes of the Commission. We have been anxious to get this matter brought to a head, and the commission will act and act promptly just as soon as we get these engineering problems cleared up so as to have the data such as will be acceptable to all interests. If we get the engineers at work to take that up, you may rest assured that the commission will lose no time in fixing a date for a public hearing.

123. Mr. Johnston: I should like to add a statement to what I said to the commission before. I stated that the Canadian interests had made considerable progress in looking into this matter. I do not want the commission to feel we have gotten very far as yet. What we have done is to have a conference to discuss the questions before the commission and the final report of the commission as it bears upon those questions. That is what I intended to state when I said we had gone ahead on the basis of the final report. We have reviewed the questions and the final report with a view to seeing how far the final report has answered the questions. We have done practically nothing with respect to computations which would enable us to reach our conclusions. Such computations have been based, I am advised by Mr. Strome, on the 1929 and 1930 records. I want to make that quite clear, that when we said we were going ahead on the final report, we were going on the basis of ascertaining how far the

and

126. Mr. Wilson: Then we should be advised of that. If no modified plans are submitted and if no one proposes to go ahead with the plans set forth in the engineers' report, a great deal of ground has been completely eliminated, unless the commission should determine to go ahead on an abstract proposition.

Mr. McCumber: These questions are submitted to us, whether there is anyone prepared to carry out the project or not.

Mr. Wilson: We do not attempt to suggest what the commission should do.

Mr. McCumber: You are just suggesting it could not do anything but go ahead on an abstract proposition.

Mr. Wilson: This thought suggested itself to us that this whole situation like most other economic problems is subject to the old basic law of supply and demand. If there is no demand for the development of this power, no one ready, willing and able to develop it at any time that can reasonably be anticipated, then it can hardly be said that it is economically desirable or practical to go ahead with it.

Mr. McCumber: That might be an excuse for delay, but hardly an excuse for failure to comply with what is submitted to us. There are certain findings that we have to make.

127. Mr. Wilson: That is true. However, the questions of the reference require the commission to determine those issues for itself. In other words, those questions do not beg themselves, and if the commission should decide right at the outset that there is no reasonable prospect within any time that can now be anticipated, there will be any demand whatever for the development of this power, certainly that would be an important factor in the economic feasibility and desirability of it, and might justify the commission in saying that no further expenditure of the time of the commission, or the money of the two governments or of the time or money of all these parties concerned, would be justified in going ahead with an inquiry which would lead to no practical results. That is, I am assuming it could be definitely determined in advance there would be no practical results. Of course, if there is a reasonable possibility that the plan proposed in the engineers' report is to be carried out, then the commission might feel in duty bound to go ahead with it.

Sir William Hearst: How can we give judgment and attempt to answer questions until we have all the material and argument before us that any person desires to present to us?

128. Mr. Wilson: I would say that the commission could not; but if the commission says to all interested parties: What are your plans? Please submit them for our consideration, if you desire to have them considered at all; and it then appears that there is no interested party desiring to go ahead with such an ambitious plan of regulation as is suggested by the engineers' report, it seems to us it would be a very serious question whether any further expenditure of the public time or money or the time or money of the private individuals concerned would be warranted. It would be a futile inquiry into an abstract proposition. So, in view of the fact that Mr. Meyer has already before this commission and also more or less publicly and privately in Minneapolis at the home office of his clients stated that it does not seem advisable to go ahead with efforts to develop the project to

the extent recommended by the engineers, and in view of the fact that there does not seem to be any other power interest ready, able and willing to undertake such development, the state thinks that whatever modified plans they have in mind should be submitted, and then the commission will be in a position to indicate whether further proceedings will be based upon those plans or upon the proposition suggested by the engineers.

129. Mr. McCumber: But the two governments that submitted the matter to the commission did not recognize Mr. Backus or anybody else. They simply wanted to know what could be done in the matter that is submitted to us on behalf of the two governments and irrespective of whether this power company or any other company was ready to go into the project. It seems to me that having been submitted to us, the only way we could relieve ourselves of our duty would be to have the governments release us from the duty which they have imposed upon us.

Mr. Wilson: I see that point and further we would have no criticism whatever to make of that attitude on the part of the commission. All that we are asking is that we be advised at as early a date as possible whether we are to go ahead and complete our investigations and determine to what extent our interests are to be affected by the plan proposed by the engineers, or whether we are to go ahead on some other plans, because the investigations that we would be required to make would necessarily be much different.

130. Mr. McCumber: We certainly want to help you out as much as possible and get this matter settled between the several engineers if it is possible for them to agree and agree early enough so that you can act on it at your legislative meeting.

Mr. Wilson: As I have already indicated, our holdings on Namakan Lake and Rainy Lake include over four hundred different subdivisions scattered round the shores of those lakes, and there are also a number of subdivisions scattered along Lake Lacroix and upper lakes. It is a tremendously laborious task to appraise the effect of these proposals on the land and the timber growing along the shore, so that if we have to go ahead with it to the extent required by the engineers' proposal, we should like to know that as soon as possible; but if some modified proposal is to be proceeded on, we should like to know that as soon as possible.

131. Sir William Hearst: We would like to help Mr. Wilson but personally I do not see how it is possible to furnish him in advance with the information he requests. I understand a public meeting is to be held. That was announced when we had the last public meeting. How can we prevent any person coming before us at that meeting with a different proposition from what the engineers have submitted to us and ask us to say whether this is not a proposition we should approve and recommend? How can we say there will not be any other person who will come forward, even if Mr. Meyer, for instance, drops out?

Mr. McCumber: But if they should agree on what would be a proposition, it would be a simple and easy matter to approve that agreement as to the engineers.

Sir William Hearst: That is these engineers, but I do not know how we could say there would not be any other alternative proposition suggested.

Mr. Wilson: Might I suggest this, that at least the interested parties could be requested to submit within a certain time any modified plans which they contemplate, so that we may

adjust ourselves to that as well as to the plan set forth in the engineers' report? This proceeding has been going on so long and the power interests who are concerned in it are so well known that it is hardly likely any of them will come forward at the last moment with some newly developed plan after they have been given an opportunity for consideration. Since Mr. Meyer has already indicated that they have a modified plan in mind and that that could be formulated within the next few weeks, could not all the interested parties be notified of that fact, and also requested, if they have any other plans in mind, that

132. they should submit the details of them so that the different parties can determine the effect of such modifications as well as the plan proposed in the engineers' report, because those effects, it is obvious, will be quite different.

Major Bullard: I want to emphasize the great practical utility of the proposal made by Mr. Wilson. Of course it is possible that others may come forward with plans and it may even be probable; but if we can discuss plans which are definitely proposed for execution, if the commission can have such plans presented, it will be much further along on its way. The plan that is developed in this report is not proposed as a plan for absolute development by some individual or organization; it is not guaranteed to be the best plan. In order to have any such guarantee, we would have to study not half a dozen or a dozen plans, but may be a hundred plans and select from them, after very exhaustive study, probably the best one. Then we could not be sure, because one individual organization would want to develop in one way suited to its own needs and another in another way. I believe it would be of the greatest benefit, in advancing the determination of this question, to ask those organizations known to have definite interests to propose by a certain time

133. a definite plan as to how they desire this development made. To be specific, I would suggest that the commission call upon the Backus-Brooks Company and its subsidiaries to furnish any definite plan; that it call upon the State of Minnesota asking if that state has any definite plan for the development. I think Mr. Wilson will cover that thoroughly. I would suggest that if the provinces of Manitoba and Ontario or the power interests in those provinces have any definite plans, that they be called upon to present them before a certain time. I would further say in regard to the difference of opinion with Mr. Meyer as to the calculations, it will certainly be of utility to discuss with Mr. Meyer while we are here, the matters which he has proposed today and of which I to-day have heard for the first time. But I do not believe that in the time that is at our disposal here we can come to a conclusion and say: We accept or we reject what you propose. It will require calculations over some time, and it may take as much as a month in order to review carefully and thoroughly the conclusions at which we have arrived. At the end of that time we may not come to an agreement. Beyond that, there are certain to be other points

134. upon which we shall not be in agreement and which will form stumbling blocks all the way along the line. I would therefore suggest that the commission give the engineers one month in which to hear anyone who proposes to criticize or question any of the calculations, not basic but close to basic data, and that beyond that time the organizations present, within say six months from the present time, their definite plans based upon the data they

believe to be correct. Otherwise I am afraid that any disagreement will simply result in further delay, more and more as we go along. I would therefore suggest again, to summarize those two points; one month to confer on the data in disagreement; six months or any time fixed by the commission of course, in which all those who propose plans submit something definite to go on.

Mr. McCumber: Mr. Meyer says he can have his plan ready from the data he has worked on, in about four weeks and have it submitted. If you are working with him during those four weeks, could you not all agree upon a plan in practically the same period?

Major Bullard: We may have differences of opinion. If we are to agree, we should be able to agree within that time, 135. but if we are to disagree, no time limit would help.

Mr. Meyer: When I made that statement then, I said it must go to the receiver. I cannot speak for the receiver. I have to go to Boston and New York. I hope to get back to my office in ten days, so it does not leave a great deal of time. But I could within four weeks present my plan to the receiver, but it will take them some time to say what the policy will be for the future.

Mr. Bartlett: I should like to ask a question of the attorney for the receiver, Mr. Rogers. Sooner or later you expect to formulate some idea of what you should contend for?

Mr. Rogers: We will have to do that.

Mr. Bartlett: When you do, are you willing to communicate your ideas to Mr. Wilson in order that he may defend against it, if necessary?

Mr. Rogers: I do not know of any reason why we should not be willing to do that. In fact, I assume any recommendations or conclusions made by the receiver will have to be incorporated in their report to the court and become a public document.

Mr. Bartlett: Would not that answer your suggestion, Mr. Wilson?

136. Mr. Wilson: Yes, so far as the Minnesota and Ontario Paper Company is concerned. If other interests intend to submit modified proposals, we should like also to be advised of them within three months at the outside, if it is at all possible. Our legislative session is limited by the constitution to ninety legislative days after the first Tuesday in January.

Mr. Bartlett: If there are any other interests proposing plans, they will be making them known to the commission, and we will let the interested parties know what they are.

Mr. Wilson: I heartily agree with Major Bullard's proposal.

Mr. Bartlett: When Attorney Rogers gets the things formulated which the company desire to contend for -- and he will do it within a reasonable time -- if he will let you know what

that is, then you will know how to defend against it. You may agree to it. It may not affect your interests. If anybody else brings in any plans before the commission, I am sure the chairmen or secretaries will let you know. We are anxious to make progress.

137. Mr. Wilson: Would the commission be willing to instruct its secretaries to communicate with the parties suggested by Major Bullard and invite them to send their plans promptly?

Mr. Bartlett: They are all here. Mr. Rogers is here representing the Backus interests. He has agreed to do that. If anything else comes up, we will let you know, of course.

Mr. Scovil: There is one phase of it: Mr. Meyer is here representing one private interest. The Winnipeg river block interest must be represented. They have retained consulting advice jointly, I believe, between the province, the city and the Winnipeg Electric. The province of Ontario also has engineering advice, so that their engineers must be consulted in the final analysis inasmuch as any conferences held with Mr. Meyer will have to be notified to them.

Mr. Bartlett: They are not here to-day.

Mr. Scovil: They were not notified.

Sir William Hearst: They were not notified, as I explained.

Mr. Bartlett: They can be notified right away and collaborate with the others.

Mr. Scovil: Mr. W. S. Lee of Montreal is acting for the combined Manitoba interests and I suppose Dr. Hogg and Mr. L.V. Rorke will represent Ontario.

138. Mr. Magrath: The difficulty that I see is harmonizing the views and suggestions of Mr. Meyer and this report. That is the first step, is it not?

Mr. Rogers: It is as I see it.

Mr. Magrath: How long is it going to take to do that?

Major Bullard: I do not think I can say yes or no positively before a month, because it will require careful calculation to review it.

Mr. Stanley: Do you feel within a month your engineers can definitely advise us either that you have agreed or that you have disagreed; that agreement is not possible?

Major Bullard: I think we can do it on that point. If any other points come up, there might be further stumbling blocks.

Mr. Stanley: On all points essential to the problem, the erection of these proposed structures.

Major Bullard: That is very difficult and possibly impossible, because that would mean agreement all along the line, not merely basic data or preliminary computations but all the conclusions, and where there are controversies it is hardly possible to hope for that agreement all along the line. Furthermore, there are certain interests represented by Mr. Meyer whose
 139. developments would be based upon their own individual needs and would not probably coincide with those of the people in general.

Mr. Stanley: In any event it strikes me we ought to know within a month the points upon which you agree and the points upon which you disagree. In addition to that we will have the data of the disagreeing engineers and the basis upon which they reach their agreements and disagreements, upon which the commission can act.

Major Bullard: I think again we cannot promise to be able to state in a month all of the points upon which we disagree and the data representing that disagreement or those disagreements. There are likely to be disagreements all along the line, and as soon as we settle one we will come upon another one. I think Mr. Meyer, who has examined this report, in how much detail I am not positive, can probably give you better than I can -- I know as a matter of fact he can better than I can -- the points on which he disagrees. So far, I have heard basically of only one point. There will no doubt be others. I think he will agree with me on that point.

Mr. Meyer: No doubt there will be some other matters
 140. coming up though I really anticipate not a great deal of disagreement respecting most of those matters. When it comes to the working out of a project, we might suggest a different type of project, but I have been over a considerable portion of the report even though I have had only two weeks on it, and I would say I do not believe we are going to strike a great many points of disagreement. If, however, my time is going to be taken up in connection with these conferences to get together on the points of difference, I cannot be using that same time for the working out of the project. I have stopped all work on the project and have gone ahead to try to reconcile our differences. If we are to have a month to do that, I cannot at the same time carry on my work on the project. Those differences must first be disposed of before I start working out a project. Then I can work out a project that will be submitted to the receivers for them to consider and pass on.

Sir William Hearst: Mr. Meyer, what is your practical suggestion in order that we may make progress? Let us have your views.

Mr. Meyer: I think, as I have already stated, it would be better for the engineers to get together and present what
 141. data and computations they have, such as the computations that I have asked for and other similar computations so that we may check each other's work and see how we have arrived at those conclusions.

Sir William Hearst. Cannot it be arranged between your engineers to get at that at once?

Mr. Meyer: I do not see why we cannot have an immediate preliminary conference and I will turn over any information I have. Perhaps after I get back to the office, we can have a conference at Duluth where all the records are on this intermediate point. It depends on Mr. Scovil's appointments or whether we can all be there at the same time for all the conferences. On points on which Mr. Scovil and I are agreed, it would not be necessary for him to be present. On others it would be. Some reasonable time must be allowed, and I think it is the best procedure to iron out these differences first and then we can talk projects.

Mr. Johnston: Evidence has been given of certain difference that have developed. I think it is fundamental that agreement should be reached upon what were the natural levels of those lakes. Our experience in connection with the Lake of the Woods easements 142. led us to realize the vast importance of that determination. All the costs of securing easements on lands above or bordering upon those lakes will be based upon the natural levels, and if there are differences of opinion between opposing interests, I foresee there will be an unending series of obstructions and difficulties ahead of us. It is of first importance that there should be agreement upon natural levels. That will materially assist the development of this problem.

Mr. Magrath: Gentlemen, will you engineers get together for a while?

At this point the commission took a brief recess in order that the engineers might hold a conference.

Thereupon at 4 p.m. the commission adjourned until Wednesday, October 5th, 1932, at 10 a.m.

October 5th, 1932.

143. The commission resumed at 10 a.m.

Mr. Meyer: Gentlemen of the commission, last night we spent a little time in looking up the original records. They were those I referred to yesterday which are observations of the actual flow required between Rainy Lake and the location of the dam to carry certain volumes of water at certain lake stages, which I believed would fully answer the questions of difference between us. This morning I found the necessary records and turned them over to Professor Wisler and at the same time asked him one or two questions in the hope of finding out the probability of our being able to get together. Immediately there appeared such a difference of opinion between us that I feel it is desirable to put into the record now one or two questions bearing upon the same matter, and I should like to ask Professor Wisler one or two questions so that there may be on record immediately some fundamental facts that have a bearing upon the reason for this difference. If Professor Wisler agrees to answer them, I again agree to answer questions that he may ask of me.

144. Mr. Magrath: Is that agreeable to you, Professor Wisler?

Professor Wisler: Yes.

Mr. Meyer: On plate 27 of the final report you show rating curves for Rainy River above the falls and for the outlet of the lake that show the relationship between lake stage and outflow in a state of nature. Will you please refer to that plate and tell me what you have computed to be the fall between the outlet of the lake and the point above International Falls as shown by your curves for a discharge of 28,500 cubic feet per second?

Professor Wisler: Remembering that these curves show the conditions before the dam was constructed, during that period prior to 1909 the fall according to those curves was about three and one-quarter feet.

Mr. Stanley: Will you explain what you mean by the fall being three and one-quarter feet? From what point to what point?

Professor Wisler: From the lake down to the crest of the falls, a distance of about four and a half or five miles.

145. Mr. Meyer: I am sorry, the distance is actually about three miles, but we will leave that for a moment. In your answer you refer to the crest of the falls. Will you kindly locate the crest of the falls a little more specifically, so that we may know what point we are speaking about?

Sir William Hearst: Will you explain that point about the construction of the dam?

Mr. Meyer: Construction of the dam was begun in 1905 by the construction of coffer dams below the falls and small coffer dams between islands on the Canadian side in general at the sides of the channel for the purpose of building particularly the Canadian power house and for the purpose of excavating the rock ridge that still existed at the head of the Canadian channel and for the purpose of putting sluice gates at that point in order to facilitate the handling of water during construction when the coffer dam would have to be built across the main channel. Construction was continued until the fall of 1907 and then discontinued until the fall of 1908 when it was recommenced. The coffer dam was put across the channel itself in the winter and spring of 1909 and the water level was raised in the lake and under control from that time on. I should like Professor Wisler's answer.

146. Professor Wisler: The crest of the falls as I have taken it is as shown on plate 76 of the engineers' report of 1916 on the Lake of the Woods, as being at section 75.

Mr. Meyer: Your level referred to on this plate 27, being the level shown by the curve "above International Falls," represents the water level on section 75.

Professor Wisler: Yes.

Mr. Meyer: Is it true that that section 75 represents the crest of the falls right at the point where the water tumbles over?

Professor Wisler: Yes.

Mr. Meyer: Do you consider that that level on the crest of the falls from a hydraulic engineer's viewpoint is one that can properly be designated as "above International Falls"?

Professor Wisler: It is not the section at which the gauge was located. That is true. It is, however, the section at which you must start your computations to determine the elevations of the watershed at various points upstream from that section.

147. Mr. Meyer: In other words, the answer that I received from the Duluth office as to what point this curve "above International Falls" on plate 27 refers to, was given me incorrectly and contrary to your understanding of what this represents. I will refer to the letter, Professor Wisler. On September 9, 1932, I wrote to Major Lyman at Duluth:

"To what point 'above International Falls' does the rating so designated refer? By this I mean whether or not this curve refers to the stage which might be observed in the pool above the tongue of rock and the Canadian head gates."

I received the following in reply on September 12;

"The point 'above the falls' expresses the relationship at section 73 near the head of the Canadian navigation canal."

Up to this point I have assumed that this answer was correct.

Professor Wisler: That answer is correct and I wish to change my previous statement. Our computations started at section 75 and from there we carried them up to section 73 which is only a couple of hundred feet upstream from section 75 and at that point section 73 is the section to which that curve refers. In my previous statement I was in error. I should have said 73 instead of 75.

148. Mr. Meyer: Is it correct it shows the water level at a point near the head of the Canadian navigation canal?

Professor Wisler: Yes.

Mr. Meyer: And above the tongue of rock in a state of nature?

Professor Wisler: It is opposite the tongue of rock.

Mr. Meyer: So that we may get to a closer understanding, what difference would you say there was in the fall between a point opposite the tongue of rock and a point say a few hundred feet above the tongue of rock?

Professor Wisler: There is liable to be considerable difference on account of the small section there at that tongue

of rock as compared with the much larger section upstream from it.

Mr. Meyer: In other words, this curve which you have marked "above International Falls" represents a point in the rapids above the falls rather than above the falls?

Professor Wisler: It represents the elevation of the water surface at the upper end of the navigation canal.

149. Mr. Meyer: And if I say that all our observations show that there is substantially a pool of quiet water above the tongue of rock and always was in a state of nature, would you say that this curve marked "above the falls" comes within a few tenths of a foot as representing the water level in the pool above the falls?

Professor Wisler: It represents the elevation of the water surface at the end of the navigation canal. As to what the velocities are, I do not recall, nor can I give them to you without reference to our original computation.

Mr. Meyer: At the same time, if I may be pardoned for referring to yesterday's conversation, I believe both Major Lyman and at least one other man, as I recall it, representing the engineers of the Duluth office, indicated that I had all that was necessary for the purpose of checking the difference that existed and that when I asked for a copy of the computations, it was not necessary and I had all I needed. Yet it develops that apparently you and I have an entirely different understanding as to what "above the falls" means, whether it means the pool of water above the falls or some point in the rapids above the falls which is usually pretty much indeterminate when we come
150. down to making computations in a rocky channel that makes a right angle turn. I want to say this to the commission that my work is limited to a point above the falls and not in the rapids and that all our curves refer to a point above the falls. I am pointing this out because I wanted to test these two curves against actual observations. If that in fact proves to be, as stated by Professor Wisler, in the rapids, it is absolutely essential that the initial computations upon which those curves were based be furnished me at the earliest possible moment or there is not the slightest opportunity of our getting together.

Professor Wisler: I have a question I should like to ask.

Mr. Stanley: What is the approximate difference in level between the point in the rapids at which you say Professor Wisler based his computations and the level of this pool to which you refer?

Mr. Meyer: I intended to follow out the initial question.

Mr. Stanley: I want the materiality of the difference between you.

Mr. Meyer: I wanted to follow out my initial question
151. with this: If Professor Wisler's curve shows a fall --

Mr. Magrath: Have you a question to ask, Professor Wisler?

Professor Wisler: Yes.

Mr. Meyer: I was answering Senator Stanley. I intended to follow my initial question which was answered to the effect that there was $3\frac{1}{4}$ feet of fall between the lake and this point "above International Falls" now located as being in the rapids at the tongue of rock, and they actually observed on May 21, 1927, there was a discharge of 28,500 cubic feet per second, which is the same discharge used in the question I asked Professor Wisler and the observed fall is about two feet to a point beyond the tongue of rock or a foot and a quarter difference. It is a question of showing them that in a state of nature there must be a foot and a quarter fall between the point at the tongue of rock and a point just above the tongue of rock, and unless that can be proven, these curves on plate 27 must be in error, either one or both. Now, Professor Wisler.

Professor Wisler: I should like to ask what the location of the gauge was to which your curve "above the falls" is referred in your report. Where does that curve refer to?

152. Mr. Meyer: There is no exact statement made in any of the records of the men who made the measurements. For example, Mr. Acres of the Ontario Hydro Electric Commission made a measurement in 1905 and again in 1906, I think it was. He referred to the level above the falls. I will wager my professional reputation on the fact that those men took it above the falls, in the pool above the tongue of rock and not in the rapids. Beyond that I have no knowledge as to where that level was taken. The Minnesota and Ontario Power Company took readings and merely referred to them as "above the falls." There was a coffer dam located at the head gates of the Canadian canal for the purpose of excavating that tongue of rock and putting in those gates, and so far as I have been able to determine from Mr. Backus, who was upon the ground and from the engineers who were there during most of the time observations were taken, that gauge was located on the coffer dam on the Canadian side above the head gates of the canal. That is as close as I can tell you as to where it was. Our curve refers to the level above the falls and not in the rapids above the falls.

153. Professor Wisler: We made a very careful study at the initiation of these investigations as to where the gauge readings were taken and as to where the "above the falls" curve as given in the 1916 report referred, and our best information was that it referred to the elevation of the water at the side of the stream above the navigation canal, and we therefore referred our curve to the same identical point. The two curves as best we could determine are tied in at the same identical point. Our "above the falls" curve is tied in at the same identical point with the "above the falls" curve as shown in the 1916 report.

Mr. Meyer: Then Professor Wisler, instead of this curve representing the water level in the rapids opposite the tongue of rock, it actually refers to a point sufficiently above where the level is substantially stable and does refer to the same location as ours does.

Professor Wisler: Yes.

Mr. Meyer: Thank you. We have covered that amount of ground. Now, I will go back to my original question.

Mr. Bartlett: Does that mean you agree on that point?

Mr. Meyer: As to the location.

Mr. Bartlett: As to the beginning of the curve?

154. Mr. Meyer: Of our whole discussion as to the difference. Professor Wisler, on May 1, 1927, according to the published records there was a discharge of about 28,500 cubic feet per second from Rainy Lake. At that time, a water level observed on the United States side at the pulp mill, also published in the reports of the commission's engineers, shows that there was an actual fall required of approximately two feet instead of three and one-quarter feet to carry that water from Rainy Lake down the stream, past the tongue of rock, past the location of the gauge, and possibly four or five hundred feet below to where the power house is now located. How do you reconcile the fact that the actual records show a fall of two feet for a given discharge and your computations show a fall of three and one-quarter feet?

- Professor Wisler: That I should say is very easily explained by the fact that those curves from which we show a fall of three and one-quarter feet, show the fall that would have been required in a state of nature, whereas the two feet fall to which Mr. Meyer refers was obtained with the dam in place; with an obstruction in the stream and slack water existing above the dam, a different amount of fall is required entirely from what was required in a state of nature.
- 155.

Mr. Meyer: Professor Wisler, does it make any difference in the water level at any given point in the stream above a dam as to whether or not all the water is being discharged through five gates or all the water is being discharged through ten gates, as long as the gates are distributed in such a way as not to make an unequal distribution of flow across the stream?

Professor Wisler: It certainly makes a difference as regards the elevation of the water surface at any point above the dam as to whether there are any gates open or whether there are not.

Mr. Meyer: I beg your pardon. My question was whether it makes any difference if you have ten gates in a dam and you open each gate a certain amount necessary to discharge, say 30,000 cubic feet per second, or open only five of those gates a greater amount, taking every other gate, in order to discharge the same 30,000 cubic feet per second? Does that make any difference in the water surface above the dam?

Professor Wisler: I do not see the point of your question at all.

156. Mr. Meyer: It is just a question of fact I am trying to

get at, a matter of hydraulics, very simple and very easily answered.

Professor Wisler: It is a very easy question to answer. As to whether it makes any difference as to the water surface upstream whether there is a dam or whether there is not, that is the point involved, not the number of gates.

Mr. Meyer: We will get to that in a moment if you will kindly answer my question. Does it make any difference if five gates or ten gates are open as long as it is the same amount of water that is being discharged?

Professor Wisler: To the elevation of the water surface?

Mr. Meyer: Yes.

Professor Wisler: Certainly it does.

Mr. Meyer: Will you kindly explain that new principle of hydraulics with which I am not acquainted?

Professor Wisler: It is not a new principle. If you had all the gates open in a dam --

Mr. Meyer: Please limit yourself to my question. I want to be sure the premises are understood. If there are ten gates open or only five gates open and discharging 30,000 cubic feet per second in each case?

157. Professor Wisler: Certainly it makes a difference.

Mr. Meyer: Will you kindly explain how?

Professor Wisler: That is so fundamental.

Mr. Magrath: I do not think Professor Wisler understands you.

Mr. Meyer: I do not think he does. I am not trying to interrupt. I am just trying to make sure we understand each other. I want to lead from that to some other question.

Professor Wisler: If all of the water of this 30,000 cubic feet per second is being discharged through those gates --

Mr. Meyer: Certainly.

Professor Wisler: -- or some of it passing over the crest of the dam?

Mr. Meyer: I made the assumption very plain. Here is a dam. We will assume it blocks the flow completely. In one case we open ten gates; in the other, five gates, the ten gates half open and the five full open, just enough to discharge 30,000 cubic feet per second in each case. That will create a back stream curve.

Professor Wisler: So that the water passes over the crest, certainly.

158. Mr. Meyer: Instead of having all gates, we have some water going over the crest of the dam, but again only having 30,000 cubic feet per second. I will make a further assumption. I will assume, instead of a dam, we have some rock ridges in here that furnish a natural control where the artificial dam is now located, and we will assume again the 30,000 cubic feet per second flowing through. We will assume further that when we were discharging 30,000 cubic feet per second with the dam in place, we had a given water level 1,000 feet above the dam. We will now take the dam away and we will put some rock ridges in its place and let the same amount of water go through and assume that is obviously the same water level at the same location. Does that mean that the water level beyond that, the back water, will show exactly the same irrespective of what we had below this section so long as the same amount of water passes this section and as long as the water level at this section stays exactly the same? Does it make any difference above that point?

159. Professor Wisler: If I have positive knowledge that the elevation of the water surface upstream from this dam is at exactly the same elevation in each case, then it makes no difference, but you are making an assumption there.

Mr. Meyer: We are down now to the question of whether or not we can prove that at a certain point above the dam in a state of nature there was a certain water level and that under control with the dam there for the same discharge there was the same water level; that then from that point on it makes no difference, the slope in the stream to bring the water to that location is the same whether nature controls or whether a dam controls. Now, then, if we did actually observe in 1916 the water level at various points above the original tongue of rock and all the way up to Rainy Lake, and we found a certain slope required to carry a certain amount of water, will the same slope be required to carry the same amount of water and identically the same stage in a state of nature and under control from this point up irrespective of what is below?

Professor Wisler: Again based upon the same assumption that the water level at this tongue of rock to which you refer is identically the same in each case, it will make no difference.

160. Mr. Meyer: Then I see no reason in the world why, when Professor Wisler submits to me his computations and I submit to him our readings of 1916, we should not come to exact agreement. The physical facts will then be before us capable of actual demonstration. Either one or the other will be right. I think, Mr. Chairman, it has cleared the atmosphere a good deal to get this into the record.

Mr. Bartlett: I should like to ask Professor Wisler a few questions. What is the real point, if any, between you now?

Professor Wisler: The point of difference is not so fundamentally the point to which Mr. Meyer refers as it is this, and this is so clear and simple that it does not require an engineer to understand it. I think I can make it perfectly clear to all of you. The fundamental point, I think, upon which we differ is --

Mr. Bartlett: You still maintain you do differ?

161. Professor Wisler: There is a difference. It is not entirely, as Mr. Meyer has stated, the difference between these two curves, but it is also as to whether this first curve from which our computations are started is correct or whether this curve up here is. The difference is very largely as to whether or not our base curve which is shown as "above the falls" curve is correct, or whether the basic curve from which Mr. Meyer starts in his 1916 report and indicates as "above the falls" curve, is. The dotted line is our curve, the 1932 report curve. I might say in reference to some discussion that was had yesterday as to our recognizing the vital importance of these curves as being the cause of our checking the computation, it was not so much the vital importance as the evident error that must exist in this basic curve.

Mr. Bartlett: When you say "basic curve," tell me which you mean?

162. Professor Wisler: The 1916 "above the falls" curve. The reason why I term that so evident is this. Referring to the 1916 report, plate 79, it shows cross sections taken above the falls. Those cross sections show a narrow, deep channel until the water reaches a stage of approximately 492. From 492 to 494 the width of the stream does not increase gradually, but it suddenly becomes very wide, more than three times the width it assumed at the lower stages. Referring now to the discharge curve above the falls as shown in the 1916 report, that discharge curve is curved until you get up approximately to this stage where the width of the stream greatly increases. The meaning of that curvature is simply this: Remember that this is a curve that shows the discharge at different elevations. For one foot elevation you get a certain increase in the discharge. As that curve is curved, the more it is curved, the more that discharge increases for a given fixed rise in the water surface. All discharge curves with which I have been familiar keep increasing in their curvature as they go up, meaning that you have a greater and greater increase in discharge for a given rise in level of the water surface. The reason for our investigating these curves was the fact that this curve does not show such an increase in discharge with a given rise in stage when you get above the elevation of around 494, but instead the increase in discharge becomes a constant above that stage, in spite of the fact that the width of the stream triples. You get the same increase in discharge for a rise of one foot at these higher levels as you do at the lower levels, which to me is fundamentally impossible.

Mr. Bartlett: That is why you think their curves of 1916 are wrong?

163. Professor Wisler: Yes, and that was the reason for our going ahead and computing these curves as we felt they must exist. I submit to you as being the fact that our curve when drawn in through the only discharge measurements that we have for verifying

it, coincides more closely with those discharge measurements than does the original curve as shown in the 1916 report.

Mr. Bartlett: You come from some starting point. What starting point do you regard as fixed and proven?

Professor Wisler: With the information that is shown on plate 76 and with the cross sections as shown on plate 79, we can determine what the discharge must be over those falls.

Mr. Bartlett: Were those cross sections taken before the dam was built?

Professor Wisler: Yes.

Mr. Bartlett: From what data?

Professor Wisler: From field surveys.

Mr. Bartlett: Field surveys before the dam was built?

Professor Wisler: Yes.

Mr. Bartlett: Were those questioned?

Professor Wisler: I have never heard them questioned.

Mr. Bartlett: You use that as a basic start so to speak and figure a different curve from what Mr. Meyer does, on the theory there must be a greater curve due to the hydraulics of the situation?

164. Professor Wisler: Yes, there must be a curvature in that curve from the very fundamental theory of hydraulics.

Mr. Bartlett: And you get a curve to a greater height than Mr. Meyer does because you figure on this quantitative proposition that you have just been explaining?

Professor Wisler: We get a curvature lower; it falls below their curve.

Mr. Bartlett: Do you not get more fall than he does?

Professor Wisler: We get more fall, but the fall is independent entirely of this curve.

Mr. Bartlett: Does not the curve represent the fall?

Professor Wisler: No, the difference between the two curves represents the fall.

Mr. Bartlett: One is the base line and the other --

Professor Wisler: The one is the curve at the falls or just above the falls at the head of the navigation canal and the other refers up to the water surface in the lake.

Mr. Bartlett: But you have a different curve than he has representing a different fall of the water?

165. Professor Wisler: Well, that shows a difference in the fall of the water, but as I say, our greatest difference, I should say, is not as to the amount of fall that occurs there, but as to the starting point, our basic curve, the curve that shows the relationship between stage of water and discharge right at the falls.

Mr. Bartlett: What does all this get to -- the question of where the natural level of the water was in a state of nature?

Professor Wisler: Yes.

Mr. Bartlett: And you project that from certain data that you have known at a certain point on the falls, do you?

Professor Wisler: Yes.

Mr. Bartlett: Do you project from the same point? As I understood it, Mr. Meyer projects from a certain point above the sharp falls and you project from the sharp falls.

Professor Wisler: We really start at the same point, the head of the navigation canal.

Mr. Bartlett: Having agreed on that, your difference in computing the natural level of the lake is a question of hydraulic theory?

166. Professor Wisler: Yes. I might say further that Mr. Meyer has been attacking the fall that we indicate, the difference in level between those two curves. I might explain to you why we have as great a fall there as we have indicated. We have wanted to be fair in this. We are not concerned with either side. We were simply wanting to be fair in it. Therefore we selected, in computing this upper curve, a high frictional co-efficient in order to be fair and in order not to take any chances and get too low a natural level of Rainy Lake. We selected our co-efficient so high that we felt we were on the safe side. Had we selected as low a co-efficient as we felt we might be justified in doing, we would have gotten a curve up here in the lake that would have fallen below this, and would have agreed with what Mr. Meyer contends is the actual case.

Mr. Meyer: Oh, no.

Mr. Bartlett: Is the only guide we have in getting at the natural level of the lake a question of computation? Are there not any historical marks or erosions on stones or things of that sort?

167. Professor Wisler: The lake has been under artificial regulation for a period of over twenty years and practically all of these original marks are now submerged and there is no way that I know of.

Mr. Bartlett: Is there not any farmer there who knows where they used to go down to drink?

Professor Wisler: There is one source of information we are still working on. There is an old Indian living up there who has lived there all his life and we have been endeavoring to get in touch with him. We sent a man out there just a short time ago to see if he could not find him and get from him some information. As to the outcome of that trip we have not learned yest.

Mr. Bartlett: We had a lot of this in New England and the wash on the shore and rocks was used for that. We have had a case pending for years on the Connecticut river. We have lots of things of that sort, marks on the ledges and things like that.

Professor Wisler: The difficulty here is that the lake has been raised so that all those marks are under the water surface. That is the trouble we have had! We have sent a man up there several times and the stage of the lake was so high that they were unable to find the original marks, but we are hoping that the lake is now low enough.

168. Mr. Bartlett: If you will pardon me, I am unlearned enough to understand how certain the point is from which you start. What is it that you absolutely know when you start with your curve?

Professor Wisler: Well, we know the condition there at the falls in a state of nature.

Mr. Bartlett: That is, from surveys, the condition of the rocks, the depth of the water, and so forth, you have a starting point?

Professor Wisler: Yes, sir. Taking the curve as shown in this report on Plate 83, we know beyond any argument, I believe, that if this curve is correct for the lower portions -- and we believe it to be substantially correct for the lower portions -- I say if it is correct up to the point where the tongue of rock becomes submerged the width of the stream trebles we know there must be a continued increase in that curve from that point on up.

Mr. Bartlett: Because that holds it back?

169. Professor Wisler: That holds it back in the low stages. In effect, what that original curve indicates is this: When you get up to the point where the width of this stream trebles there is no water discharge over that tongue of rock. There could not be any discharge over that tongue of rock or there would be a curvature in this curve up above.

Mr. Bartlett: As a result you have a natural level of the lake lower than that arrived at by Mr. Meyer?

Professor Wisler: Yes.

Mr. Bartlett: About how much?

Professor Wisler: I do not remember the exact amount.

Mr. Bartlett: Do you know, Mr. Meyer?

Mr. Meyer: In the flood of 1927 it was something over two feet all summer, varying in amount.

Mr. Bartlett: And the difference between you would vary with the height of the flood? Is that true?

Mr. Meyer: Yes. Mr. Chairman, may I add a word? First of all, I want to say there is nothing in what Professor Wisler has said that does not involve the same considerations to which we all gave attention in 1914, 1915 and 1916 when these curves were originally worked out. Professor Wisler made the statement that his curve as published in the report of 1932 more nearly conforms to the observed meterings than the curve published in 1916 and 1930 and agreed to by Mr. Scovil yesterday.

170. I find on referring to this diagram that Professor Wisler's curve is about 0.8 of a foot below Mr. Acres' metering when there was a discharge of about 14,000 cubic feet per second, which is a strategic point as I see it, and which is the point where his curve starts to drop away down and where our curve stays up and passes through Mr. Acres' metering, accepting that as being correct.

Professor Wisler has referred to the impossibility of finding any natural high water marks. I can only conclude, then, that he has completely discarded the photograph that we took of natural high water marks as we considered them to be; for example, on October 15, 1913, and as published.

Mr. Bartlett: Did they have access to those photographs?

Mr. Meyer: They are in this published report. In addition to that, there are dozens of photographs that are published. There were also water marks photographed in 1915. It is true that the dam had been in, but it is true also that there are levels that are in the lake that show that the lake had never been at those high water marks at the time these pictures were taken. Therefore, I say that the marks were there to show where the water went in the past in a state of nature. You can see very decided defined marks on the rocks. You notice these marks showing the lichen and moss.

Mr. Bartlett: What makes that show white in the photograph?

Mr. Meyer: All of the lichen were removed there. Some represent levels that did not occur as frequently.

171. Mr. Bartlett: You think that was a water line at some time?

Mr. Meyer: Yes, decidedly. This is just a lichen that has been removed by the water. There are three water marks shown on the picture. That is Plate EE taken in 1915, and water marks are shown running all the way up to elevation 500. The first engineers that went on the Lake of the Woods put a large bolt into the rock on the Fort Francis side and called it 500 because it represented the high water mark on Rainy Lake.

Mr. Bartlett: My experience with water marks is that you get a streak sort of parallel with the water.

Mr. Meyer: That is true, simply because the lichen had not all been removed to the same point. At some time the water was up to the upper mark; at another time it was at an intermediate mark, and at still another time it was at this lower mark.

Mr. Bartlett: Did it not make a ridge in the rock itself?

Mr. Meyer: No, the rock was too hard and the water did not stay long enough.

172. Now, to go back to the question of hydraulics as though the fundamental hydraulics of the situation proved our curve of 1916 to be wrong. The photographs published in our report are the best possible proof of the way the water came down the stream, around the end to the tongue of rock and up to the crest of the falls and tumbled over the crest of those falls. Plate MM showing Koochiching Falls has only a few buildings in the background taken before any dam was built, clearly showing the tremendous drive of water from around the end of the rock and leading up to the crest of the falls. The section at the crest of the falls is not the section through the tongue of rock. Let us have that clear. This Plate MM clearly shows the tongue of rock with the water very much higher above the tongue of rock than it is on the side below the tongue of rock.

Section 73, which is at the tongue of rock, shows high points at elevation 496, and the entire section that we are speaking about that Professor Wisler said would be trebled is shown on this photograph very clearly as being covered with timber, broken rock and debris, with only a small section sufficiently clear from trees and debris to admit any appreciable amount of overflow.

The section which carries the water is shown as 24 or 25 feet deep, and then alongside of this deep 25 feet comes this section that Professor Wisler referred to that would treble in size carrying, however, practically no water to think of when we think of 30,000 or 40,000 feet because the high points read elevation 496.

173. We had computed the discharge at those various sections when we derived those curves in the same way, and I still insist that the actual measured fall from Rainy Lake from above that tongue of rock as made in 1927, which shows about two feet as against the computed fall of 3.5 feet required to bring that water down, is proof that those curves of 1932 can not be correct.

Mr. Bartlett: How far is it from the point where the fall is sharp back to where we are trying to compute the level of the Lake?

174. Mr. Meyer: About three miles.

Mr. Bartlett: What we are talking about is to determine how much the water falls from the level of the lake in going down to this sharp fall.

Mr. Meyer: Not quite to the sharp fall, but to a point above where that sharp fall occurs.

Mr. Bartlett: I am not sure I understand it. If the lake is back here three miles or so, and the falls, we say, are down three miles, the lake narrows up somewhat in getting down to the falls?

Mr. Meyer: There are rapids right outlet and then the river is wide and deep with practically no fall for almost the entire distance until you come right above the head of the rapids at the falls.

Mr. Bartlett: You are talking about how much the fall is from the level of the lake down to the sharp falls.

Mr. Meyer: Just ahead of the sharp falls where the river is still wide and deep.

Mr. Bartlett: That at different stages of the level of the lake varies somewhat, does it?

Mr. Meyer: It does decidedly. It varies somewhat in a state of control.

175. Mr. Bartlett: I am talking of a state of nature. In a state of nature there would be some fall in getting down those three miles?

Mr. Meyer: Yes.

Mr. Bartlett: Would the fall be more when the lake is higher than when the lake is lower or vice versa?

Mr. Meyer: In general it is conceded to be the case that it requires more fall at the higher stages than at the very low stages.

Mr. Bartlett: When the lake is high water, flood water, is there more fall from that level down to the falls, these three miles, than there would be when the lake is down low?

Mr. Meyer: Yes, because of the rapids at the outlet.

Mr. Bartlett: This thing you call curve, does that have anything to do with the decline of the water as it gets down to the dam?

Mr. Meyer: Yes; the curve represents that fall.

Mr. Bartlett: I am trying to see what it means. The curve represents the decline on this drawing that I have made?

176. Mr. Meyer: May I put it in this way? There are two curves. The one curve is at the left hand side of your drawing, being the lake, and the second curve is at the right hand side of your drawing, being the point above the falls, and each curve shows how high the water is when there is a given amount of water flowing in the river.

Mr. Bartlett: I guess then I am not right. If that is the level of the lake, the full height it is falling going down the three miles is not what is represented on the map?

Mr. Meyer: No, but the difference is represented by the difference between these two curves; that is, the fall from the lake to the falls is represented by the difference between the two curves shown on the drawing.

Mr. Bartlett: Instead of saying three feet or two feet, you represent that by a curve?

Mr. Meyer: Yes.

177. Major Bullard: Might I interrupt for a moment just to make it a little clearer just what this curve means basically? These curves are all based essentially on the same idea. Measuring on the left you have certain elevations measured from the assumed 500 which was just taken arbitrarily. So that at any point on the curve you can see at the left that the elevation of the water surface is, say 491 and so on.

Mr. Bartlett: What represents the level of the lake?

Major Bullard: The level of the lake is represented at any time by anyone of these curves as going across the 494. If you take the elevation 495, then going down to the bottom of the curve you come to the figure 18 which is 18,000 and that shows you the number of cubic feet per second passing through the river for that elevation. If you lower the level of the lake to

493, starting from 493 you read over to the curve showing the lake and you get a discharge of about 13000.

Mr. Bartlett: You are away over my head. These curves do not have anything to do with the slant of the water from the lake down to the falls, do they?

Major Bullard: The difference between the two curves does.

Mr. Bartlett: It is merely a way of your showing --

178. Major Bullard: A variation in discharge as dependent upon water levels. I might show that in another way by drawing a sketch. Suppose we go into the field and measure on a certain date that the elevation of the lake at a certain point is 500 feet above some assumed level.

Mr. Stanley: Those elevations all refer to sea level datum?

Major Bullard: This particular level to which we refer, the 500, was taken without reference to sea level. Suppose at elevation 500 we determine that the discharge was 30,000 cubic feet per second. We measure 30,000 along the horizontal and put a dot opposite the 500 and opposite the 30,000. On another day we measure the elevation at 492 and we find the discharge was about 10,000. At other elevations we make other discharge measurements, and we draw a smooth curve through those.

Mr. Bartlett: It is only a geometrical curve like a stock market curve or something like that. It has not anything to do with the lake level. There are some ways of computing the slant from the falls back up to the level of the lake, and Mr. Meyer gets a higher level from his computations than you do.

179. Major Bullard: There were a number of measurements made. Mr. Meyer drew a curve and we drew a curve, and we were not greatly different, but extending it into the area where there were no measurements there was a great deal of difference as to whether it should go up as a straight line or as a curved line.

Professor Wisler: If I may interject one more remark, we have had so many differences here that I think it is rather lucky we have one case in which we agree. In reply to a question that I believe Governor Bartlett asked as to whether there was greater fall in that stream from the falls up to the lake at high stages than at low, Mr. Meyer said there was and with that I heartily agree. However, I might call attention to the fact that the curves as indicated on plate 33 of the 1916 report show the reverse to be the case; that at high stages there is a fall of one and six-tenths feet, whereas when you come down a little bit lower, that keeps increasing. The fall, in other words, becomes less and less as the stage increases.

Mr. Meyer: What does the same plate show the fall to be in low water?

Professor Wisler: That depends upon which of the various curves you take. There are several curves at the low stages, and if you take the curves that apply to the same dates, they indicate the same thing.

180. Mr. Meyer: If I may refer to the blue print which shows the curves of 1916 so far as the mean or average relationship is concerned, I think it must be very evident that they show about one foot at extremely low water and about one and seven-tenths or one and eight-tenths feet at high water. Professor Wisler stated that the difference in fall of three and one-quarter feet and two feet for the same discharge and that the difference in fall shown by the curves of 1932 as opposed to the difference in fall shown by the curves of 1916 and 1930, was due, as I recall it, largely to the fact that they had used large frictional coefficients to be on the safe side; that they had no grudge against anyone and were not trying to use a curve or a discharge coefficient which would be disadvantageous. I want to say that our curves were worked out in 1916 without reference to whose foot would be pinched by the result and that we used coefficients we believed to be accurate and correct, which were later checked by the slope readings of 1916 to which I have referred and which are available for anyone to use to get the correct coefficients and not coefficients that are either on one side or the other.

Mr. Bartlett: What was the object of working them out in 1916?

181. Mr. Meyer: To derive the fact of the relationship in a state of nature between Rainy Lake level and discharge.

Mr. Bartlett: It was done on some reference or other?

Mr. Meyer: Mr. White and I as engineers to the commission on the Lake of the Woods reference worked out these curves to which I now agree, to which Mr. Scovil now agrees, to which Mr. Scovil and Major Crawford agreed in 1930. Hydraulically, we are told, it is impossible for the upper portion of that curve to be a straight line. I challenge that statement and I am willing to prove in any laboratory, where a controlled section on a stream varies as it does in this case, you can have exactly that type of curve. I go one step further. I show you in the 1932 report, plate 13, which shows the rating curve of the Namakan river at the outlet in Lake Lacroix, and I ask you to look at the upper end of that curve as I pass my ruler along that curve, and I ask you as to whether or not that line is substantially straight. I will show it to each one of you commissioners. Is it substantially a straight line as showing the relationship between outflow and stage for lake Lacroix? This is a situation considerably similar in that it is a lake with a rough, rocky, irregular outlet.

182. Mr. Bartlett: That is a straight line. That is all it means to me.

Mr. Meyer: That is all I want to prove. There are other rating curves where there is control, where there is a straight line relationship, showing it is not a physical impossibility for this curve to be correct. In fact, I say it is decidedly physically possible to be correct because I say it is based on computations and also on observed readings.

Mr. Bartlett: Do you ever take into account in this sort of study the situation that would exist at the bed of the river if there was no water in it? Is the terrain at the bottom of the river up three miles at the same level as it is down at the falls?

Mr. Meyer: We carefully consider the shape and height of the bottom and the sides and the turns the water must make in coming down the stream, the size of the channel, the irregularities.

Mr. Bartlett: If the channel dips down a few feet in going this distance, would that make the water flow faster?

183. Mr. Meyer. The water flows fastest near the outlet where it goes over rock ridges. It jumps over two ridges; then it gets down into a wide, deep section of the river where there is only $3/10$ ths or $4/10$ ths of a foot fall in about two miles, because the channel is so large there is practically no fall. The fall represented by those two curves that I have been referring to represents substantially the fall required to force that water through those rapids at the outlet of the lake. That, hydraulically, is what it substantially represents, because there is only $3/10$ ths or $4/10$ ths feet fall in about two miles against a fall of $1-3/10$ ths feet repeatedly observed in a distance of about half a mile where those rapids occur.

Mr. Magrath: Perhaps you had better say a word or two as to your work in the past in connection with this problem before us because there seems to be some doubt. They do not seem to be aware of your connection with this work in the past.

Mr. Meyer: The curves called in question in the 1932 report are the curves that are published as part of the report of the consulting engineers to the International Joint Commission in the Lake of the Woods investigation. Mr. Arthur B. White then represented Canada, and I represented the United States. Our report was made in 1916, after an exhaustive study of all of these matters.

184. Mr. Bartlett: I should like to ask Professor Wisler some questions. Can you tell me how you came into this case or what your initial position is or something of that sort?

Major Bullard: Professor Wisler is consulting engineer for the American engineer assigned to the duty of assisting the commission in determining the Rainy lake levels.

Mr. Bartlett: That is yourself?

Major Bullard: I have been. Major Lyman is now officially designated for that purpose by the state department.

Mr. Bartlett: How long have you been on the case?

Major Bullard: I was on duty from July, 1928, until July 1932.

Mr. Bartlett: Who was your predecessor?

Major Bullard: Major Crawford. There were two other officers, Major Merks and Major Lamb who were originally assigned and had only a very short time in connection with it. Major Crawford did the real initiation of the work.

Mr. Bartlett: In your work did you take into account the

185. marks, physical evidence of the height of the lake?

Major Bullard: I cannot give you positively from my own knowledge how much weight was given to that.

Mr. Bartlett: Who can?

Major Bullard: I am not sure whether Professor Wisler can or not, but the actual work was carried out by Mr. Voght who is at present at Duluth and is not here today.

Mr. Bartlett: Who figured out the curve? Professor Wisler?

Major Bullard: Mr. Voght under Professor Wisler's direction.

Mr. Bartlett: When did Professor Wisler come in?

Major Bullard: He was employed about December, 1929.

Mr. Bartlett: As regards the matter of a curve, do you take into account these monuments or evidences of height of water, or do you make your curve theoretically, and then compare that with other evidences of the height of the water?

Major Bullard: I would prefer to have Professor Wisler answer that.

186. Professor Wisler: We did take into account all the data available: the photographs to which Mr. Meyer referred and the records of high water levels and all that. We gave it all its proper weight.

Mr. Bartlett: In making this curve you differ with each other. Did you consider monuments at all or was that all theory?

Professor Wisler: Well, I cannot say that we considered monuments. There are no monuments.

Mr. Bartlett: Apparently there are some evidences of the height the water went to at different times. I do not know whether there is substantial evidence of that or not. But I am asking you whether you took such evidence into account or just made your curve theoretically.

187. Professor Wisler: Well, it is made theoretically and then checked as well as we could check it by all the observed levels. If I may make this further statement, I am not at all averse to a reconsideration of our curves. I am not, however, optimistic as to our agreeing as to which is correct and which is wrong. We both are so firmly convinced that we are correct that I am afraid it will be difficult to reconcile fully our views each with the other. I should, however, like to say this, that it appears to me as though this matter has assumed entirely undue importance. It is important in connection with the determination of the natural levels of Rainy Lake. It is important in determining the damages that have occurred to property owners on Rainy Lake and it is of some importance in determining the cost of this storage that is obtained on Rainy Lake. I should, however, like to call your attention to the fact that the storage on Rainy Lake is the cheapest storage that we have had on any of the lakes and it matters not whether we start with our

curves or whether we start with Mr. Meyer's curves, we arrive at the same conclusion.

Mr. Bartlett: As to what?

188. Professor Wisler: As to the profitable storage that can be obtained on Rainy Lake. It is merely a matter of degree, of a slight change in the cost of that storage, and that change I will guarantee will not be so great as to make any vital difference in the final conclusions as to any of the questions of the reference. The answer to question 4 will be slightly different if we start with our curves from what it would be if we start with Mr. Meyer's curves, but in either case the final conclusions are the same.

Mr. Stanley: Question 4 has to do with the cost of storage?

Professor Wisler: Yes.

Mr. Stanley: That is the thing I have been waiting to get at all the time. The one point that is of interest to the commission is the amount of water power developed, the approximate cost of it, and then the variation in the levels of the lakes, both high and low water, in a state of nature and under this system of control. When it comes to low water, of course the lakes, I presume, will always be higher to a degree than they would be in a state of nature?

Professor Wisler: Yes.

Mr. Stanley: When you come to considering high water, does the construction of your dam raise the level of the lake above what it would be in a state of nature, say by three feet? Is that what it would raise it?

Professor Wisler: No.

Mr. Stanley: What is the level of the pool you create?

189. Professor Wisler. The amount of rise in the level varies considerably from time to time. It depends upon the natural flow of the stream as to how much water may be drawn out of Rainy Lake at any particular time, so that it is very hard to set any figure as being the amount that the lake has been raised. It depends upon the particular day to which you refer.

Mr. Stanley: I understand that of course you let the water out of the dam for use and that lowers the level, but under the proposed structure with the gates closed, how much would this dam raise this pool above what it would be if there were no dam there?

Professor Wisler: That in turn depends entirely upon how much water there is flowing.

Mr. Stanley: We will assume the flow of the water over the dam. If you put in these proposed structures and close your gates, how much will those structures artificially raise the level of the pool?

Professor Wisler: The elevation of the dam is at elevation 497. The height above natural high water is six and one-tenth feet.

190. Mr. Stanley: Take any arbitrary figure. Say that the level of the water was 497 or 490 in a state of nature. Assuming there is water enough flowing to go over the dam, how much would the proposed dam with its sluices closed raise that above that arbitrary level?

Professor Wisler: If the water was at 490 in a state of nature, with the dam closed it would be around let us say 498 because there would be about a foot of water going over the crest of the dam.

Mr. Stanley: Ordinarily, whatever the high water was in a state of nature, with the same amount of rainfall occurring after the construction of the dam, the subsequent high water would be the high water that you had in a state of nature plus the artificial height of the dam, would it not?

Professor Wisler: No.

Mr. Stanley: Approximately that?

Professor Wisler: No.

Mr. Stanley: What is the artificial raise?

Professor Wisler: For the reason that the back water does not increase, that is, as you raise the water level down to the dam by, say six feet, you will not raise the level of the lake six feet. It will be something less.

191. Mr. Stanley: Leaving out the question of the rapids, the tendency of this dam is to raise any high water that much higher, leaving out the foot or two of those falls, with the dam than without it?

Professor Wisler: It would if there were no excavation.

Mr. Meyer: Just one word more. I am sorry I have kept you with our details so long. I have repeatedly referred to actual measurements of the fall from the lake to the dam during the flood of 1916. I assume that when Professor Wisler referred to having used all the observed levels, he did not refer to those observations.

Professor Wisler: I cannot answer that question at present for I have not with me all the data with which we worked. I am not sure whether we had any data in regard to the fall during 1916. My recollection is that we did have it, but I would not say positively one way or the other.

192. Mr. Meyer: Then, may I ask this question, Professor Wisler? If you have the actual, observed fall through Pither's Rapids for a certain lake stage and you have the actual, observed discharge, the amount of water flowing at the time, and you have the cross section of the channel as referred to by you previously, as shown by the map of Pither's Rapids and as referred to in the report, is it not true you can then compute coefficients of discharge for use in that channel which are actual facts and not

estimates?

Professor Wisler: Yes. May I say just one word in reply? The net result that would accrue from the use of these actual coefficients to which Mr. Meyer has just referred would be this, if I may have the blueprint, it would in no wise affect the "above falls" curve used in the 1932 report. The only difference that would result would be to drop the "in lake" curve used in the 1932 report, thereby showing still lower natural levels in Rainy Lake.

Mr. Meyer: Thank you for that answer, because I believe it will fully show the absurdity of the curves. It will show, for example, that in a state of nature at a lake stage of 497 water would have been flowing out of that lake at the rate of over 38,000 cubic feet per second, and the lake never on any reasonable assumption of flood inflow could have made the high water marks shown on the rocks.

Mr. Bartlett: What have you to say to that, Professor Wisler?

Professor Wisler: I simply can say we have not seen those high water marks on the rocks referred to by Mr. Meyer.

Mr. Meyer: You said you used them, the photographs of them, not the marks themselves.

193.

Professor Wisler: I will say this, that that dotted curve may be slightly in error, but no attack has yet been made upon the method that was used in deriving it. The method upon which that curve was derived is basic. If the laws of hydraulics apply, the "above falls" curve as published in the 1916 report, cannot be correct.

Mr. Meyer: I can only answer that if the laws of hydraulics apply as I have studied them and taught them in the University of Minnesota for a number of years in the same way Professor Wisler is teaching in the University of Michigan, that curve of 1916 is correct, so you will see what chance there is of our reaching an agreement.

Mr. Bartlett: The commission knows Mr. Meyer and his qualifications. I should like to ask Professor Wisler as to his education and experience and knowledge.

Professor Wisler: I have been graduated from the University of Michigan, receiving the degree of Bachelor of Civil Engineering and Master of Science in Engineering.

Mr. McCumber: What year?

194.

Professor Wisler: In 1913 I received the Bachelor of Civil Engineering and in 1915, Master of Science. I should have graduated in 1907 had I not had difficulty with my eyes, so my statement of my number of years of engineering experience may appear inconsistent. I have had twenty-five years of experience as consulting engineer in hydraulic engineering.

Mr. Bartlett: Are you teaching?

Professor Wisler: Yes.

Mr. Bartlett: Where?

Professor Wisler: At present I am Professor of Hydraulic Engineering in the University of Michigan.

Mr. Bartlett: How long have you been professor?

Professor Wisler: My rank was changed from associate professor to professor about a year and a half ago.

Mr. Bartlett: How many years do you say you have been teaching in the college?

Professor Wisler: I have been teaching there since 1915, with the exception of two years when I was associated with a consulting engineer in Albany, New York.

195. Mr. Bartlett: When you are advising on a case like this, are you still teaching in the college?

Professor Wisler: I am not teaching there this week.

Mr. Bartlett: But generally speaking, they permit you to go out?

Professor Wisler: Yes.

Mr. Bartlett: Do you advise on cases more or less?

Professor Wisler: I am busy practically all the time, being retained by someone or other.

Mr. Bartlett: Have you been on any large cases we know about?

Professor Wisler : I was employed by the State of New York in the defence of the state in connection with claims arising as a result of the construction of the barge canal. I have been consulting engineer for the State of Michigan, the Department of Conservation, for the last nine years. I have this last summer been engaged by the Indiana Engineering Company in some litigation which they had with the State of Illinois -- various jobs of that character.

196. Mr. Bartlett: Not knowing very much about your experience and having had this difference here, I thought it was well to ask what you had been doing. That was all.

Mr. Stanley: One other question. Can you tell, roughly speaking, about what would be the approximate difference in cost including damages and the like of that overflow in the area affected, between the calculations based upon your computations and the calculations based upon the computations of Mr. Meyer?

Professor Wisler: The estimated cost of damages to lands and improvements on both Rainy and Namakan lakes as given in our report is \$100,000. That is based upon damages as they are at present legally payable.

Mr. Stanley: What would those damages be if you took his calculations?

Professor Wisler: I do not know.

Mr. Stanley: Would there be any material difference?

197. Professor Wisler: That depends upon more than is indicated by these curves. It depends upon the determination of the ordinary high natural level, the ordinary high water mark as it is frequently referred to, and I suspect that there will be considerable difference of opinion between various individuals as to what will be that ordinary high water mark on Rainy Lake.

Mr. Stanley: If you accept his computations, his statement, as correct; supposing you had made no observations yourself and you are given the computations, the findings of Mr. Meyer, and told to estimate the area affected just as you did from your own data, what would be the difference?

Professor Wisler: Using the "above falls" curve as shown in the 1916 report, I am not sure what Mr. Meyer would say is the ordinary high water mark in Rainy Lake, and until I knew that, I could not answer your question. It might possibly be we would be in complete agreement, but I cannot answer it until I know what his answer would be.

Mr. Stanley: Can you make any approximate of the difference from his computation of high water mark as shown by that curve?

Professor Wisler: He has rather indicated in some of his remarks there would be no damage.

198. Mr. Stanley: So I gather, that it would be less at least. As I understand Mr. Meyer, he intimated that with the present construction the water in a state of control would be no higher than with that tongue left there. Am I correct?

Mr. Meyer: Correct in so far as the extreme flood water is concerned, but not as far as the every day levels from year to year are concerned.

Mr. Stanley: Do your computations, Professor Wisler, give a high water mark above his computations of natural high water mark?

Professor Wisler: Well, Mr. Meyer has not submitted any computations or any determination of the high water mark.

Mr. Meyer: The maximum high water mark.

Professor Wisler: And the vital thing here is what is the ordinary high water mark.

Mr. Stanley: That is what destroys the vegetation. High water for a few hours or a day or so will not do any great amount of damage?

Professor Wisler: No.

Mr. Stanley: It is the settled stage of water does it?

Professor Wisler: Yes.

Mr. Meyer : On Rainy Lake high water always lasts a long time; it is not like a stream.

199. Mr. Stanley: You cannot tell me whether your computation would result in a materially greater damage to riparian owners than Mr. Meyer's?

Professor Wisler: I have certain definite opinions as to what the ordinary high water mark on Rainy Lake is, and I do not believe that that would be greatly different, regardless of whether we used Mr. Meyer's curve or whether we used our own curve. As to just how much difference there would be between what he would determine as being the ordinary high water mark and ours, that I could not say.

200. Mr. Stanley: As I understand it, the commission is anxious to ascertain just how material your differences are as to the effect of these constructions in raising the level of the lake generally above what it would be in a state of nature and the damage to riparian owners, as regards timber, agricultural land and the like. That is the vital thing now. We have skilled engineers, both American and Canadian, and Mr. Meyer, qualified in every way to advise us, and we could be happy "were t'other fair charmer away." If it is true that the net results of their computations are not materially different, we could, to be on the safe side, take the computations of the engineer who shows the greatest amount of damage and reach a conclusion on that.

Mr. McCumber: Might I ask Professor Wisler a question here. You heard the testimony of Mr. Scovil. In substance, if I have it correctly, it was that the difference between your conclusions and those of Mr. Meyer for all practical purposes was hardly material. Do you agree with that?

Professor Wisler: Hardly material?

Sir William Hearst: So far as storage was concerned.

Mr. McCumber: Do you agree with that?

Professor Wisler: Yes.

Mr. Stanley: As I understand the matter, they are agreed as to the amount of storage obtainable, and as to the cost of that storage outside of injury to riparian owners, there is no difference between them. The difference is as to the effect upon the shore lines by the difference in level.

Mr. McCumber: I understood the testimony of Mr. Scovil was rather as to the practicability of the matter to the questions that must be decided by the commission.

201. Sir William Hearst: I did not so understand him. I understood him to say for practical purposes from a storage standpoint he did not think there would be any material difference, but when you came to the question of property damage, there might be a material difference.

Mr. McCumber: He did not indicate it would be very material in any instance as I remember his testimony. My purpose in asking this question is this: I can see no reason why you and Mr. Meyer, notwithstanding you disagree so much on one point, cannot get together and agree about what it would mean if you adopted Mr. Meyer's proposition. You have already given us the result of what you have adopted. Why cannot you get together and see if you can agree upon what the result would be upon the several questions if you accepted Mr. Meyer's proposition?

Professor Wisler: I would be very happy to get together with Mr. Meyer and see if we can agree. I might say, however, that there is going to be another point aside from the point that he has raised in regard to the correctness of those curves, which is likely to lead to very material differences, to which you refer, Senator Stanley. I suspect there will be a great difference perhaps as to the conclusions that we will draw as to what the ordinary high water mark is.

202. Mr. McCumber: Suppose you take Mr. Meyer's conclusion. I assume that he is certainly capable of making a conclusion and that he will make it for you. Then can you not get together and agree upon what the results of those conclusions would be from Mr. Meyer's standpoint for the many questions we have to answer?

Professor Wisler: Yes.

Mr. McCumber: Then we can decide to better advantage at least as to what we will do in the case from an engineering standpoint.

Mr. Stanley: As I understand it, from an observation of these lakes as you have stated it the rise and fall of these lakes are nothing like as rapid or sudden as the rise and fall in a river a mile or so wide. Whatever stage is obtained is held for some time on account of the immensity of the watershed. In that event, if you established any high water mark as a result of the proposed structure, you practically figure that the water reaching that point will be destructive to boat houses or vegetation or mills or anything else that happens to be below it. Is that right?

Professor Wisler: Yes, sir.

Mr. Stanley: So your high water mark whatever it is will form a fairly substantial basis upon which to calculate damages?

203. Professor Wisler: Yes, sir.

Mr. Stanley: Then I do not see why you and Mr. Meyer can not get together, take your high water mark and his high water mark -- you have already your computations of the value of these various properties -- and ascertain what would be the difference in damages to riparian owners and the like between the two calculations. Does not that seem feasible to you?

Professor Wisler: Yes, sir, it does.

Mr. Stanley: What do you think about it, Mr. Meyer?

Mr. Meyer: I think it could be done.

Mr. Magrath: Before we adjourn, gentlemen, is there anything else you would like to say at the present time? Otherwise, the matter is closed for the present.

204. Major Bullard: I would like to say to the Commission that in any further work that is to be carried on I will not be in a position to keep in touch with the calculations and the developments; that Major Lyman before there will be any further meeting of the Commission will be in full swing and will carry on better than I could; that while I do not wish to say to the Commission that I do not desire to be called again, I do wish to say that if I can be of any service I am sure that the Chief of Engineers and the War Department will always be ready to order me back; but I feel that it will not be necessary, and I want to express to the Commission my appreciation of the great honor which it has been to work under the Commission and the great courtesy which has always been shown me. In order to be sure and a little bit more positive, I would like to ask if there is any difference as to the understanding of the mission of the engineers in regard to the point that has been discussed. I have worded it in this way: The engineers to report to the Commission an opinion as to the effect of any plans proposed by interested parties, agreeing, as far as possible, upon the data and methods of calculation, or reporting what may be such differences and their effect.

Mr. Meyer: Mr. Chairman, is there any doubt in anybody's mind now, after all that has been said, as to whether or not I shall have access to calculations and computations leading up to these matters about which there have been differences?

Mr. Stanley: Major Bullard, did you put in that memorandum the approximate area affected?

Major Bullard: I said the effect of any plan.

205. Major Lyman: In connection with Mr. Meyer's request for computations and data, there are certain limitations which are placed upon me as to what may be distributed. There are certain War Department files, and so forth which can not be let out. They are not public documents. There is also certain work that is carried on in the office that I can not let out. But I will always be very glad to meet Mr. Meyer if he will come to our office and discuss the matter with him, and I will let him have everything I can within limits of the regulations.

Mr. Meyer: Thank you, Major Lyman; and I understand, then, that the restriction you have just referred to does not cover the calculations that I had requested in my letter of September 9th and to which you replied on September 12th that the Commission had not authorized those calculations to be made public? You would now feel free to make them public if the request were renewed?

Major Lyman: I do not feel that it is necessary to send out my work sheets and the figures that have been worked on in the office. In reply to that request, I feel that the method of computation and all the data which were used in the computation are in the reports. The method is described on page 202. There are some things which I can not set out formally, but which can be had in the office informally; and if Mr. Meyer will come to

Duluth I think we can have a discussion and iron out the details of this request.

206. Mr. Meyer: Thank you, Major Lyman, and I believe if I had had access to the computations I had requested at that time we could have saved at least this morning's time of the Commission and considerably more.

Mr. Magrath: If there is nothing further at this time, gentlemen, the Commission will now go into Executive Session.

(Thereupon, at 1:15 o'clock p.m., the Commission went into Executive Session).