

FINAL REPORT
OF THE
International Joint Commission
ON THE
RAINY LAKE REFERENCE

WASHINGTON—OTTAWA

1934

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FINAL REPORT

RAINY LAKE REFERENCE

INTRODUCTION

The Rainy Lake Reference was transmitted to the Commission by the Government of the United States and the Government of Canada on February 27, 1925. The text of the Reference is as follows:—

I have the honour to inform you that, in pursuance of Article 9 of the Treaty of the 11th January, 1909, between Great Britain and the United States, the Governments of Canada and the United States have agreed to refer to the International Joint Commission the following questions for examination and report, together with such conclusions and recommendations as may be deemed appropriate:—

Question 1. In order to secure the most advantageous use of the waters of Rainy lake and of the boundary waters flowing into and from Rainy lake, for domestic and sanitary purposes, for navigation purposes, for fishing purposes, and for power, irrigation and reclamation purposes; and in order to secure the most advantageous use of the shores and harbours of both Rainy lake and the boundary waters flowing into and from the lake, is it, from an economic standpoint, now practicable and desirable, having regard for all or any of the interests affected thereby, or under what conditions will it become thus practicable and desirable—

- (a) 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 elevation 1108·61 sea-level datum?
- (b) To regulate the level of Namakan lake and the waters controlled by the dams at Kettle falls in such a manner as to permit the upper limit of the ordinary range of the levels to exceed elevation 1120·11 sea-level datum?
- (c) To provide storage facilities upon all or any of the boundary waters above Namakan lake?

Question 2. If it be found practicable and desirable thus (1) to regulate the level of Rainy lake, and/or (2) to regulate the level of Namakan lake and the waters controlled by the dams at Kettle falls, and/or (3) to provide storage facilities upon all or any of the boundary waters above Namakan lake—

- (a) What elevations are recommended?
- (b) To what extent will it be necessary to acquire lands and to construct works in order to provide for such elevations and/or storage, and what will be their respective costs?
- (c) What interests on each side of the boundary would be benefited? What would be the nature and extent of such benefit in each case? How should the cost be apportioned among the various interests so benefited?

Question 3. What methods of control and operation would be feasible and advisable in order to regulate the volume, use and outflow of the waters in each case in accordance with such recommendations as may be made in answer to questions 1 and 2?

Question 4. What interests on each side of the boundary are benefited by the present storage on Rainy lake and on the waters controlled by the dams at Kettle falls? What are the nature and extent of such benefits in each case? What is the cost of such storage and how should such cost be apportioned among the various interests so benefited?

Each Government will appoint from its public service such engineering and other technical assistance as may be necessary to enable the Commission to make the desired examination and to submit their report.

The Rainy Lake Reference grew out of the investigation relating to the Lake of the Woods. One of the recommendations of the Commission in its report on the latter investigation was that when the demands for water-power should warrant it, the reservoir capacity of the Upper Rainy watershed might be increased. For this, and presumably other reasons, the Governments decided to request the Commission to carry out an investigation of the Rainy Lake watershed some-

what similar in character to that which had already been completed in connection with the Lake of the Woods watershed, and at the same time that their plenipotentiaries signed the Convention and Protocol in the matter of the regulation of the Lake of the Woods, they also addressed to the Commission identical letters of reference concerning the levels of boundary waters within the Rainy Lake watershed.

Engineers It will be noted that in the letter of reference provision was made for the appointment of engineering and other technical assistance from the public services of the two countries. The Canadian Government appointed Mr. Stuart S. Scovil, at that time of the Dominion Water Power and Reclamation Service, who has remained on this work throughout and has had charge of all Canadian operations. The United States Government appointed the District Engineer, Duluth District, Duluth, Minnesota. This latter office has been held in turn by several officers of the Corps of Engineers, United States Army. Major E. H. Marks, from April, 1925, to June, 1925, and Major C. F. Williams, from July, 1925, to September, 1925, made preliminary arrangements, including the provision of funds and the laying out of field work. Major R. W. Crawford from September, 1925, to July, 1928, carried out the field work and initiated the hydraulic computations. Major P. C. Bullard acted from July 18, 1928, to October, 1932, and Major (now Lieut.-Colonel) A. K. B. Lyman served from that date up to the close of the investigation.

Hearing, 1925 A public hearing was held at International Falls, Minnesota, September 28 to 30, 1925. At the outset of the hearing there were put into the record numerous written protests from towns, municipal organizations, conservation and other societies and individuals, against any change in the water levels of Rainy lake or the other lakes embraced in the investigation. Oral statements were also made on behalf of the State of Minnesota, the Arrowhead Association, the Izaak Walton League, and other organizations and individuals on the United States side, as well as on behalf of the Government of Manitoba, the City of Winnipeg, the Winnipeg Electric and Manitoba Power Companies, the Canadian National Railways, the Town of Fort Frances, the Shevlin-Clarke Company and various lumber companies on the Ontario side of the boundary. Mr. E. W. Backus set forth the views of the companies represented by him as to the additional storage on Rainy, Namakan and other lakes.

Conferences In January, 1926, the Commission had a conference in New York with the engineers, who supplied an estimate of the time and funds necessary for the collection of the engineering data needed for the formulation of answers to the questions of the reference. The engineers were instructed to proceed with these investigations.

The Commission held an executive meeting in Ottawa in October, 1928, when the engineers reported that the field investigations had been practically completed, but that studies necessary to an engineering report which could embody conclusions were of such a complex and involved nature that much time would still be needed to complete such a report. The engineers were instructed to prepare for publication, for the information of interested parties, basic physical data pertaining to the watershed resulting from their observations and field investigations.

This Preliminary Report was prepared and published in 1930 and copies were sent to all interested parties. It consists of four volumes, Text, Tables, Plates, and Atlas.

At the October, 1929, meeting in Ottawa, after conferring with the engineers, it was decided by the Commission to hold a public hearing as soon as interested parties had had an opportunity of studying the Preliminary Report of the Engineers.

When the Commission met in Ottawa, in October, 1930, however, owing to the fact that in the interval Major Bullard had decided it was necessary for him to check the basic data, which would take some considerable time, and that after this check had been completed it would still be necessary to prepare engineering studies based on the data, and to prepare the Engineers' Final Report to the Commission, it was found necessary to postpone the public hearing.

Throughout 1931 the Canadian and United States engineers continued their examination of the data collected in connection with the investigation and conferred together from time to time. They also reported progress to the Commission at both the April and October meetings in this year. Because of the large interests involved and the widespread concern as to the outcome of the investigation, the Commission felt it important that nothing should be left undone to bring together all relevant information necessary to enable them to answer the questions of the reference.

Engineers' Final Report The engineers completed their Final Report and submitted it to the Commission in April, 1932. Attached to this report is a statement by Mr. Scovil setting forth certain points in which he did not find himself in agreement with Major Bullard; and also a statement by Major Bullard commenting upon Mr. Scovil's reservations and exceptions. The final report consists of 451 pages of text, together with 125 plates, a separate volume of 140 tables, as well as the Atlas of maps. Chapters II, X and XI, consisting of a Summary of Results, Determination of Extreme Low and Ordinary High Natural Levels, and Storage and Power Studies, Benefits and other Effects, were published separately for the information of interested parties, to whom copies were forwarded. Copies of the complete report were filed in the offices of the Commission, in the offices of the United States District Engineer at Duluth, of the Government of Minnesota at St. Paul, of the Deputy Minister of Surveys of Ontario at Toronto, and of the Deputy Minister of Mines and Natural Resources of Manitoba at Winnipeg, where they were made available for study by representatives of the various interests.

At the regular meeting of the Commission in Ottawa in October, 1932, the Commission conferred with the engineers, as well as with representatives of the Receivers of the Minnesota and Ontario Paper Company, the State of Minnesota and the recreational interests. The engineers were instructed 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."

At the meeting in Washington in April, 1933, the Commission again conferred with the engineers, who reported that they would require time to study a report prepared by Mr. Adolph F. Meyer on behalf of the Receivers of the Minnesota and Ontario Paper Company outlining a scheme of development of the Rainy Lake waters. At the same meeting a letter was considered from the Attorney-General of Minnesota explaining that it would take some time to prepare the case of the State, and that they would not be ready for a hearing before October, 1933. In view of the considerable time that had already elapsed, the Commission decided to hold public hearings in June, 1933. This was not found practicable, however, because of the death in the interval of Mr. Commissioner McCumber.

After giving all interested parties an opportunity to study the Final Report of the Engineers, the Commission decided to hold public hearings in the city of Winnipeg beginning October 5, and in Minneapolis beginning October 9, 1933. In sending out notices of these hearings there was included a copy of the Supplementary Report of the Engineers dated April 3, 1933, prepared in response to the request of the Commission in October, 1932.

Final Hearings, 1933 At the hearing in Winnipeg on October 5 and 6, 1933, briefs or other statements were filed on behalf of the Governments of Canada, Ontario, and Manitoba, the Department of Public Works of Canada, the Department of Indian Affairs of Canada, the City of Winnipeg, the Town of Fort Frances, the Winnipeg Electric Company, the Manitoba Power Company, and Northwestern Power Company, the North Western Ontario Associated Chambers of Commerce, and the Canadian National Railways. Oral testimony was also presented on behalf of these interests, as well as on behalf of the J. A. Mathieu Lumber Company and subsidiaries, the Local Union of the Pulp, Sulphite and Paper Mill Workers of Fort Frances, the Quetico-Superior Council and the Receivers of the Minnesota and Ontario Paper Company.

Public hearings were held in the city of Minneapolis on October 9 to 12 inclusive, 1933. Briefs or other statements were filed on behalf of the State of Minnesota, the Receivers of the Minnesota and Ontario Paper Company, the Izaak Walton League, the Minnesota Conservation Council, the Quetico-Superior Council, the American Legion, and other organizations and individuals, for the most part in Minnesota, as well as copies of certain Acts and Resolutions of the United States Congress and the States of Minnesota, Wisconsin, and South Dakota, decisions of the Supreme Court of Minnesota and of the Judicial Committee of the Privy Council of Great Britain, etc. Oral testimony was presented on behalf of these various interests, as well as on behalf of Mr. E. W. Backus, and of the Town of International Falls, and by counsel and engineers representing various Canadian interests.

SUMMARY OF PHYSICAL CONDITIONS

The area to which the Rainy Lake Reference refers forms a sector of the headwaters of the Hudson Bay drainage basin, which latter is one of the main drainage systems of the northern continent, and which extends from the height of land slightly west of Lake Superior to the Rocky mountains. The Rainy Lake drainage basin, sometimes referred to as the Upper Lake of the Woods drainage basin, comprises an area directly west of the Lake Superior drainage system, and extends south of the international boundary into Minnesota to the northern limit of the Mississippi basin.

The waters from the Rainy Lake basin flow generally westward along the international boundary until they reach the Lake of the Woods; from the Lake of the Woods the flow is northwesterly by way of the Winnipeg River through the provinces of Ontario and Manitoba to Lake Winnipeg. In Lake Winnipeg the waters of the Saskatchewan join those of the Winnipeg to form the Nelson River, which flows from Lake Winnipeg into Hudson Bay and has a drainage area of 450,000 square miles.

Drainage Basin The Lake of the Woods drainage basin has been conveniently divided into three sections, viz: the Upper Rainy watershed, being the portion above International Falls and Fort Frances; the Lower Rainy watershed, being the portion immediately tributary to the Rainy River below International Falls; and the watershed of the Lake of the Woods proper, being that portion which, except the Rainy River, drains directly into Lake of the Woods above its outlets at Keewatin and Kenora.

Rainy Lake, with an area of approximately 345 square miles, forms the collecting basin for the Upper Rainy watershed, an area of 14,900 square miles, of which 10,360 square miles are in Ontario and 4,540 square miles in Minnesota. Approximately 150 miles to the east and at an elevation of 475 feet above Rainy Lake, the drainage commences in North Lake on the international boundary and

flows through Gunflint Lake into Lake Saganaga. From the latter lake, the river connection between intervening lake expanses diverges from the international boundary and the flow is through Ontario around the north side of Hunter's Island, by way of the Maligne River, Kawnipi Lakes, and Sturgeon Lake to the boundary waters of Lac la Croix. Meanwhile, along the international boundary to the west of Lake Saganaga, a second water system, tributary to Lac la Croix, has its source in Cypress Lake, from which the flow is westward through Knife, Carp, Birch, Basswood, Crooked, and Iron Lakes, and thence into Lac la Croix.

Stream Flow The flow from Iron Lake is through two channels, the larger percentage leaving the boundary and passing through Ontario by way of McAree Lake to Lac la Croix. The smaller channel, which has been further reduced by the presence of a small dam placed in the aid of logging operations, follows the international boundary, through Bottle Lake, a continuation of Iron Lake, into Lac la Croix.

From Lac la Croix the entire outflow, except in extreme flood stage, is again to the north, away from the border and westward through Ontario by way of the Namakan River to Namakan Lake. A secondary chain of lakes along the international boundary, draining into Namakan Lake, comprises Loon, Little Vermilion, and Sand Point Lakes. During periods of extreme high water on Lac la Croix, a small percentage of the outflow of the lake is over Beatty's Portage into Loon Lake.

Control Dams At the outlet of Namakan Lake, control dams were constructed whereby the levels of and the outflow from Little Vermilion, Crane, Sand Point, Kabetogama and Namakan Lakes into Rainy Lake have been artificially controlled since March, 1914. From the outlet of Rainy Lake, which has been controlled since March, 1909, by the dam and power house of the Minnesota and Ontario Power Company, the flow is through the Rainy River into Lake of the Woods.

In addition to the Maligne River, mentioned above, the boundary waters are augmented by tributary streams on both the United States and Canadian sides. The most important of these are the Seine and Turtle Rivers, which discharge into Rainy Lake on the Canadian side, and the Kawishiwi and Vermilion Rivers on the United States side, the former flowing into the boundary waters at Basswood and the latter at Crane Lake. Below International Falls, two important tributaries, the Big Fork and the Little Fork Rivers, join the Rainy from the south.

Economic Use Of the land situated along the international boundary above Rainy Lake, there is a relatively small percentage suitable for cultivation. The land is covered almost entirely by forest, either virgin or second growth. From North Lake along the boundary down to and including Lac la Croix, there is practically no settlement. The Laurentian rock formation generally underlies the Upper Rainy watershed, with frequent outcrops, the soil cover being scant. In addition to the boundary lakes mentioned, there are numerous lakes, both tributary to and along the boundary, which in the aggregate represent 2,670 square miles, or 18 per cent of the total drainage area.

Logging operations have been extensively carried on in the United States, and few large stands of saw timber remain south of the boundary. On the Canadian side logging is being carried on under government regulation throughout the watershed. Large quantities of pulpwood are obtained from both sides of the boundary and represent one of the largest potential values which the area possesses. In general the pulpwood is used by the paper mills located at International Falls and Fort Frances, which, with the existing saw-mills, are the principal industries supporting a combined population of twelve thousand people in these two towns.

Other industrial developments in the watershed are found principally in the iron mining districts around Winton and Ely in Minnesota, and near Atikokan, Ontario.

In addition to these developments, the area is attracting an increasing number of sportsmen and tourists. Of the boundary lakes, Crane Lake on the Namakan chain has exceeded the others in the development of this potential use of these lakes.

FACTS AND CIRCUMSTANCES

For a clear understanding of the facts and circumstances surrounding the present investigation, it is necessary to summarize briefly the history of the Lake of the Woods Investigation. About 1887 the Canadian Government authorized the construction of what was known as the Rollerway Dam in the western outlet of the Lake of the Woods to improve navigation conditions. Between 1893 and 1895 the Keewatin Power Company, under authority of the Government of Ontario, built the Norman Dam in the Winnipeg River about a mile below the Rollerway Dam. Stop-logs were placed in this dam in 1898 at the expense of the provincial Government for the purpose of controlling the outflow for the benefit of navigation. In 1899 the Rollerway Dam was partially removed, but the Norman Dam continued to have a marked effect upon the levels of the Lake of the Woods, the mean lake levels of which were maintained about 3.5 feet above what they would have been under natural conditions.

Lake of the Woods Investigation

In 1902, as the result of surveys by engineers of the United States War Department, a project was adopted by Congress for the improvement of Warroad harbour, on the south side of the Lake of the Woods, so as to provide a seven-foot channel. When this project was extended by Congress in 1905, it was proposed by the United States engineers that the Norman Dam might be so operated as to secure a level more satisfactory to the maintenance of the projected depths in Warroad harbour than the stage which had prevailed since the adoption of the project. This proposal was brought to the attention of the Government of Canada by the Government of the United States, the specific suggestion being that the Norman Dam be so operated as to prevent the level of the Lake of the Woods from falling below the datum of 7.2 on the Warroad gauge. This proposal the Canadian Government did not feel could be accepted because the maintenance of the minimum stage of 7.2 would result in injury to important industries at Keewatin and Kenora in time of high water, and also because it would be impossible to maintain a minimum stage of 7.2 during low water without constructing a dam in the eastern outlet of the lake. As a matter of fact in 1906 the eastern outlet was completely closed by the construction of a power plant by the town of Kenora.

Meanwhile complaints had been made by settlers on the south shore in Minnesota that their lands had been submerged by high levels caused by the construction of dams at the outlets in Canada. The complaints were reported upon by Colonel Neff of the United States Department of the Interior. There were apparent here two more or less conflicting interests on the south shore, navigation demanding a relatively high level on the Lake of the Woods and settlers complaining that their lands were flooded.

Diversions

It appears that the submission to the Commission of the question of the regulation of the levels of the Lake of the Woods and the advantageous use of its waters, and of the waters flowing into and from that lake, was an outgrowth of changes and fluctuations in its level which culminated in the low water conditions of 1910 and 1911, and also of attempts, on the part of certain interests in the United States to divert some of the water from

the Lake of the Woods watershed into Lake Superior. This proposed diversion was from Birch lake in northern Minnesota, against which the city of Winnipeg and other Canadian interests had protested.

In June, 1912, the Lake of the Woods Reference was transmitted to the Commission. When the Commission came to consider the terms of this Reference and the questions that would have to be answered, it at once became apparent that the investigation would involve extensive field surveys and the collection, analysis and co-ordination of a vast amount of physical data. This technical work was put under the charge of the Commission's consulting engineers, Mr. Adolph F. Meyer, of Minneapolis, and Mr. Arthur V. White, of Toronto, who were appointed in October, 1912, and who for a period of years were with their staffs continuously engaged in gathering the data to enable the Commission to answer the questions of the Reference.

Areas As the Commission stated in its Report on the Lake of the Woods investigation, the extent and magnitude of the area to be covered in this investigation and the difficulties surrounding the field work, may be better understood from the fact that the superficial area of the Lake of the Woods, including Shoal lake, is 1,485 square miles, or about 400 square miles greater than that of the state of Rhode Island. The entire drainage area of this lake and its tributary waters is 27,170 square miles, an area 5,000 square miles greater than that of Nova Scotia, and greater than the combined areas of the states of New Hampshire, Massachusetts, Rhode Island, Connecticut and Delaware. As most of the area that had to be surveyed in detail was the low land subject to past or possible future flooding, and as most of this land was swamp, marsh or bog, the difficulties encountered in the field work are manifest. Nevertheless this work was carried on without reference to unfavourable climatic or other conditions, and was prosecuted with all possible dispatch and at the least possible cost.

The consulting engineers completed their field work and computations and submitted their report to the Commission in September, 1915. This report consisted of three volumes and an Atlas, the former including Text, Tables and Plates. Additional matter was added in 1916 and the report in its final form appeared in 1917.

Meanwhile the Commission had held public hearings at various places in the Lake of the Woods district and had obtained a quantity of testimony. These hearings, the record of which was subsequently published in a series of volumes, were held at International Falls and Warroad in 1914; at International Falls, Warroad and Kenora in 1915; at International Falls and Winnipeg in 1916; and final arguments the same year at Washington.

Lake of the Woods Report The Commission submitted its own Final Report to the two Governments in June, 1917, which was published the same year. In this report, as a Supplement to its discussion of the Lake of the Woods situation and its conclusions and recommendations, the Commission surveyed the physical conditions of the area, as well as its history, the problem of the international boundary, the progress of settlement, and the various interests involved in the investigation, such as water supply and sanitation, agriculture, lumbering, mining, fisheries, navigation, recreation and power development. It is to be noted that in all these matters the Commission in reporting upon the Lake of the Woods Investigation, necessarily included the field of the present reference, which is part of the Lake of the Woods watershed. However, neither in the field work of the engineers, nor in the public hearings, were the physical or other circumstances of Rainy Lake and the waters tributary to Rainy investigated to anything like the same extent as in the case of the Lake of the Woods proper. In effect therefore, the results of the present investigation of the storage

possibilities of Rainy Lake and its tributaries will be to provide the same detailed information in regard to those waters as was already available for the Lake of the Woods proper.

Convention and Protocol To complete the record of these facts and circumstances leading up to the present investigation, it remains only to record the fact that on February 24, 1925, there was signed at Washington a Convention and Protocol between His Britannic Majesty in respect of the Dominion of Canada, and the United States, for regulating the level of the Lake of the Woods, and of identical letters of reference submitting to the International Joint Commission certain questions as to the regulation of the levels of Rainy Lake and other upper waters. It may be noted that by the terms of this Convention and Protocol the final settlement of the Lake of the Woods question was definitely tied up to the Reference to the Commission of the Rainy Lake problem.

ENGINEERING INVESTIGATION

Reference has already been made in the introduction to the appointment of engineers to assist the Commission in carrying out the Investigation and answering the questions of the Reference, and also to their having been instructed in January, 1926, to proceed with the necessary field work. In accordance with these instructions, the engineers and their assistants, proceeded to carry out the necessary triangulation, contouring, evaluation and timber cruising operations, the American and Canadian engineering forces acting in concert and dividing the area between them. These branches of the work were completed by the summer of 1928. Although the hydrometric work was also started in 1926, this work was continued to 1931 owing to the fact that the value of such records increases proportionately with their length. Upon the completion of the major portion of the field work, the meteorological and hydrological studies were begun for the purpose of determining the yield that could be depended upon at each of the possible reservoir sites that had been revealed by the field surveys.

Preliminary and Final Report In 1930 the engineers submitted to the Commission a Preliminary Report. The particular purpose of this report was to make available for the studies of other engineers, the maps and other physical data found in this investigation, as well as the results of certain preliminary calculations. This Preliminary Report, as elsewhere stated, was printed and published in four volumes, Text, Tables, Plates, and Atlas.

In 1932 the engineers submitted their Final Report to the Commission. In this report are embodied most of the material contained in the volumes of Text, Plates and Tables, some of the data having been corrected and observations of additional years added. The Final Report and the Supplementary Report of April, 1933, which have not been published, therefore supercede the printed Preliminary Report, and the Atlas accompanying the Preliminary Report now becomes a part of the Final Report.

The primary objectives of the Final and Supplementary Reports were to provide the Commission with

- (a) the engineering data and studies needed to answer the questions contained in the Reference, so far as those answers depended upon engineering facts;
- (b) a clear statement of the methods employed and the steps taken in the solution of the problems presented; and
- (c) a compilation and discussion of the basic data used in the solution of those problems, or that might be desired by other agencies in connection therewith.

Engineering Considerations

In summarizing the results of their investigation, the engineers point out that they have confined themselves to engineering considerations, not understanding it to be to their mission to consider questions not closely related to engineering. They found that the possible engineering solutions were many and various, depending upon purpose, economics, financing, restrictions, control, etc., and concluded that it was not practicable to discuss all possible solutions. What they did was to select and study a number of possibilities, and from these studies they were able to develop a solution which they believed would provide for the most advantageous use of the boundary waters.

The limiting levels for regulation, the amounts wherein these levels differ from natural levels, the increase in storage, and the total contemplated storage, will be found in tabular form on page 11 of the Final Report. The engineers proposed an extreme level of 0.5 feet above each of the high regulating limits.

It is pointed out that the extreme level of Rainy Lake would be 2.5 feet above elevation 1108.61, as mentioned in the Reference, and similarly that the level of Namakan Lake would be 5.39 feet above elevation 1120.11. The proposed storage would cause, within the regulating limits, an increase in the range of levels of approximately 16 feet on Saganaga Lake, 6 feet on Northern Light Lake, 12 feet on Basswood Lake, 2 feet on Lac la Croix, as compared with the actual ranges that obtained during the twenty-two years, 1909 to 1930, and a similar comparison for Namakan and Rainy Lakes for the period since the construction of the structures at their outlets indicates, in the opinion of the engineers, that the amplitude of the range of levels of Namakan would be unchanged, and that the range on Rainy would be reduced 2 feet.

Method of Regulation

The method of regulation presented in this solution of the problem contemplates first the maintenance of the maximum dependable flow at the outlet of the Lake of the Woods; second, the nearest approach to the maximum dependable flow at International Falls consistent with the above conditions; third, the production of the maximum dependable outflow from the other boundary waters except Saganaga reservoir; and the regulation of Saganaga so as to produce the maximum prime power below. This method is termed "Type B Regulation" in the Engineers' report.

Under this proposed regulation, the level of Rainy Lake on April 1st of each year must not exceed elevation 1108.61. In case the inflow exceeds the dependable outflow during the ensuing six months, the stage may be allowed to rise, but not higher than elevation 1110.61. The level of Namakan Lake must not exceed elevation 1120.11 on April 1st of each year and during the succeeding six months may similarly be permitted to rise to elevation 1125.0 provided the inflows exceed 3,250 c.f.s. Every reservoir above Lake of the Woods must be so regulated that when its level reaches the upper regulating limit, the full inflow must be discharged at the outlet. If, as a result of unavoidable circumstances, the stage of any of these reservoirs should rise above the upper regulating level as previously specified, it must never, under any circumstances, be permitted to exceed that maximum regulating level by more than one-half foot and must be restored to the above prescribed upper regulating level as quickly as is physically possible.

Reservoirs

Under type B regulation a continuous flow of 6,320 c.f.s. throughout the twenty-two year period of record could have been maintained at International Falls, whereas with the existing storage the maximum continuous flow that could have been maintained was 5,500 c.f.s. On Lake of the Woods a continuous outflow of 11,400 c.f.s. would have been maintained throughout the same twenty-two years, whereas the actual outflow was less than that amount for over 60 per cent of the time.

In making these studies the engineers assumed that the operation of the reservoirs would be placed under the continuous control of an international

board, which would have control over the regulation of all the lakes involved in the present investigation as well as the authority now exercised over the Lake of the Woods by the International Lake of the Woods Control Board.

In the opinion of the engineers the flowage easement to be permitted or procured upon riparian lands should include the right, with respect to those lands, to regulate the levels of the lakes within the elevations herein prescribed, and the right to clear the land to such elevation above the upper regulating level as might be required by constituted authority. The resulting damages would be assessed accordingly.

Areas Affected The areas affected by flowage have been taken as those areas lying between the ordinary high water level and an elevation 2 feet above the upper regulating level, except that the area for Rainy Lake has been taken above elevation 1108.61 and that for Namakan reservoir above elevation 1120.11. It is, however, emphasized that much of this zone will not be damaged to the full extent of its value.

The estimated areas affected are as follows:—

Reservoir	Area affected Square miles	
	United States	Canada
Saganaga.....	6.3	16.7
Basswood.....	8.7	4.5
La Croix.....	4.3	5.4
Namakan.....	16.9	4.4
Rainy.....	16.5	27.5
Total.....	52.7	58.5
Grand total.....	111.2	

Of the above, the increase in area directly flowed totals 76.5 square miles.

The structures required for storage alone would include:

On Rainy Lake, an added height of two feet on the present dam at International Falls;

On the two dams at Kettle Falls, an added height of 5 feet, and about 19 small block dams to close other over-flow outlets of Namakan Lake;

On Lac la Croix, a control dam at the outlet, and a block dam at Beatty's Portage.

On Basswood Lake, a control dam;

On Saganaga Lake, a control dam at the outlet and a block dam at Swamp Portage.

Costs of Additional Storage The respective costs of the foregoing additional storage have been computed as follows:

	Storage structures	Clearing and damages to land and improve- ments	Total	Cost per horse power
	\$	\$	\$	\$
Saganaga and Northern Light.....	78,000	610,000	688,000	123
Basswood.....	102,000	380,000	482,000	118
La Croix.....	75,000	260,000	335,000	135
Namakan (additional).....	181,000	635,000	816,000	70
Rainy (additional).....	50,000	1,000,000	1,050,000	50
	486,000	2,885,000	3,371,000	75

The studies upon which the estimates of flowage damages have been made by the engineers are not to be regarded as final and conclusive. They emphasize that this portion of their estimates includes damages which are possible and may be caused but that it may not be possible to establish the right of any particular interested party to the amounts in question.

The engineers point out that various factors of practical operation make it impossible to obtain from a reservoir the full gross benefit of all storage which is theoretically possible within a given range of levels. In their Report the "gross benefits" have accordingly been reduced to "net benefits" by the application of percentages of efficiency.

In the following table the engineers show the distribution of net benefits from the increase in storage, which benefits would be realized at the power plants on the Winnipeg River and at the outlets of Rainy and Namakan Lakes, from Type B regulation.

Net Benefits Derived from Storage from Type B Regulation—in Horsepower

Plants at outlet of	Basswood	Saganaga	La Croix	Namakan	Rainy	Total
	h.p.	h.p.	h.p.	h.p.	h.p.	h.p.
Rainy lake.....	292	400	175	2,870	5,250	8,990
Lake of the Woods.....	32	44	21	72	135	304
On Winnipeg river.....	3,770	5,170	2,290	8,690	15,820	35,740
Total benefits in horse power.....	4,090	5,610	2,490	11,630	21,210	45,030

The following table shows the same distribution of benefits, expressed in percentages of the total benefit from each reservoir:-

Net Benefits Derived from Storage from Type B Regulation—in Percentages

Plants at outlet of	Basswood	Saganaga	La Croix	Namakan	Rainy	Whole group
Rainy lake.....	7.1	7.1	7.1	24.7	24.8	20.0
Lake of the Woods.....	0.8	0.8	0.8	0.6	0.6	0.7
On Winnipeg river.....	92.1	92.1	92.2	74.7	74.6	79.3
Total.....	100.0	100.0	100.0	100.0	100.0	100.0

In addition to the foregoing benefits, flood conditions on the Lake of the Woods and on the Winnipeg River would, the engineers believe, be appreciably improved. They say that had this storage been available and utilized during the twenty-two year period, 1909-1930, in accordance with Type B regulation, the level of the Lake of the Woods would never have exceeded 1061.9, nor have fallen below 1056.0, and the greatest flood discharge would have been slightly less than that which actually occurred in 1927.

They believe that these several benefits can be obtained without materially affecting the use of the waters for domestic and sanitary purposes. No irrigation or reclamation interests are involved. Navigation on these boundary waters will in some cases be improved and in other cases be damaged by the development under consideration; however, this phase has not been studied in detail.

The cost of the present storage in Rainy Lake and in the waters controlled by the dam at Kettle Falls, is taken by the engineers as the cost of a simple storage structure at the outlet of Rainy Lake at Ranier, and the cost of the

present two dams at Kettle Falls, together with the cost of flowage rights on these lakes as they may be now legally payable. The other costs relating to the present developments of Rainy Lake are chargeable to power developed at International Falls. The cost of the present storage is reported as:

	Storage structures	Damages to lands and improvements	Total
	\$	\$	\$
Rainy.....	52,000	100,000	196,000
Namakan.....	44,000		

In regard to the present storage on Rainy Lake and on the waters controlled by the dams at Kettle Falls, the engineers remark that it is apparent that this storage, as actually operated, has been of material benefit to the allied power interests at Fort Frances and International Falls, whose organizations own and operate these dams. On the other hand, they say, it does not appear that the actual past operation of this storage has, on the whole, been of material benefit to the power interests at the outlets of Lake of the Woods or to the power interests on the Winnipeg River in Manitoba.

Storage Studies All storage studies contained in the Report of the engineers are based upon the twenty-two year period, 1909-1930, for which stream flow records are available. They have considered that the critical period from the standpoint of storage requirements and of expected dependable flows occurred between 1916 and 1930. A study of the run-off conditions of the Lake of the Woods watershed since 1930 indicates a critical condition more acute than that which existed during the period upon which the various calculations are based. For this reason the engineers consider that the results as given in their Report as to dependable flow and amounts of benefits, must be revised as soon as sufficient time has elapsed to show that the period of drought now prevailing has passed. They believe, however, that the distribution of benefits will be approximately the same, whether based on the period from 1916 to 1930, or on the present critical period.

PUBLIC HEARINGS

INTERNATIONAL FALLS, 1925

A public hearing was held in the city of International Falls, Minnesota, in September, 1925. This was in the nature of a preliminary hearing for the gathering of information bearing upon the questions of the Reference. Arguments were not presented at this hearing, as it was felt that this would not be practicable until the interested parties had before them the results of the field work and studies of the engineers.

There were present at this hearing representatives of interested departments of the Federal Governments of Canada and the United States, the State of Minnesota, the Province of Manitoba, Mr. E. W. Backus, the municipalities of Winnipeg, International Falls, Minn., Fort Frances, Ontario, and other smaller communities on both sides of the international boundary, the Canadian National Railways, the Winnipeg Electric Company and the Manitoba Power Company, the Minnesota Arrowhead Association, the Minnesota Division of the Izaak Walton League, the Commercial Club of Ely, Minn., the Commercial Fisher-

men's Association of Ranier, Minn., the Shevlin-Clarke Lumber Company and other lumber companies in the district, and various individuals interested in the subject matter of the Reference.

There were filed with the Commission at this hearing and embodied in the record, letters and documents from the Assistant Attorney-General of Minnesota, the General Land Office of the United States, the United States Department of Agriculture, the United States Department of the Interior, the Shevlin-Clarke and Virginia and Rainy Lake Lumber Companies, the Department of Drainage and Waters of Minnesota, the Canadian National Railways, the Department of Marine and Fisheries of Canada, the Department of Public Works of Canada, the Department of the Interior of Canada, the Department of Indian Affairs of Canada, the Government of Ontario, the Attorney General of Manitoba, the Winnipeg Electric Company, the City of Winnipeg, the Lake of the Woods Milling Company, the Keewatin Power Company, American Game Protective and Propagation Association, Conservation Council of Chicago, Izaak Walton League of America, Superior National Forest Recreation Association, Civic and Commerce Division of the St. Louis County Club, International Convention of Citizens of Fort Frances, Hennepin County Sportsmen's Club, the Towns of International Falls, Kenora and Fort Frances, and various individuals.

Testimony was presented at this hearing both for and against the proposed increase in levels of Rainy Lake and the waters above that lake, and as to the effect of various levels upon the interests of water power, lumbering, mining, fisheries, navigation, sanitation and recreation. It came out in the course of the hearing that some interests favoured a higher level, some preferred a lower level, and some held the view that there should be no interference with existing levels.

Backus Interests Mr. Backus in the course of his testimony filed with the Commission the following statement as representing the views of his water-power and other interests:—

“For the past several years our engineers have been engaged in making extensive exploration, investigation and survey of the various lakes and rivers on the watershed tributary to Rainy River on both sides of the international boundary, in gathering statistics relating to the run-off from these waters, and in reviewing and studying the whole subject of providing additional storage on the upper Lake of the Woods watershed, including the cost thereof and the effects which it will produce in controlling the levels of Rainy lake and Lake of the Woods, and the flow therefrom.

“The data and information accruing from these investigations have served emphatically to second the conclusions of your Commission in its report of June 12, 1917, as to the desirability of storage reservoirs on the boundary waters in question for the benefit of all interests involved. The same recommendation, as affecting the power resources of the Winnipeg river in Manitoba, had been independently made by J. T. Johnston, B.A.Sc., Chief Hydraulic Engineer, Dominion Water Power Branch, Department of the Interior of the Dominion of Canada, in his report of July 16, 1915, on the Winnipeg River Power and Storage Investigations. These two reports are matters of public record and clearly present the conclusions drawn from the exhaustive investigations conducted.

“The necessity for additional storage on the boundary waters for the benefit of all interests, private and public, is so fully recognized that but little reference thereto is demanded. Conditions naturally existing have been substantially improved by the present storage on Rainy Lake and the Namakan chain of lakes which has, of necessity, been heretofore used as the sole regulating medium for the waters above along the entire boundary. Its inadequacy for this pur-

pose, and the necessity for supplementing it, has been clearly demonstrated by the fluctuation in levels that has been experienced, and by the wide variation and uncertainty in water supply for public and private purposes that have prevailed.

"The existing industrial developments and communities at International Falls and Fort Frances are based largely upon the extent of the waterpower there available. The full possibilities of this power have not been available due to the extreme variations in level and flow above referred to; the industries there have already expanded far beyond the realized power output and further development and expansion will be practically impossible unless these interests secure the proper co-operation in taking advantage of the excellent natural conditions which exist for rendering this power uniformly dependable through proper storage and regulation. This storage is economically attainable, and early action is recommended, first, to secure the benefits as promptly as possible, and second, to develop the storage reservoirs at a lower cost than will be possible if development be too long delayed.

Available Storage Capacity and Its Cost, Rainy Lake "The volume of storage on Rainy lake, between elevations 493.5 and 497.5 is 39 billion cubic feet. The amount of storage capacity added if the lake is raised to elevation 500.0 will be 24 billion cubic feet. The area overflowed between the old shore line and a new shore line at elevation 501.0 is estimated to be approximately 1,444 acres in Canada and 9,313 acres in the United States, largely swamp and low land of little value.

"On September 29, 1922, Mr. A. F. Meyer, formerly one of the consulting engineers of your Commission, prepared at the request of the Canadian engineers an estimate of the cost to compensate for the damage that would be caused by raising Rainy lake from elevation 497.0 to 499.5, with additional flowage rights of one and a half feet. His estimate amounted to \$257,000. In it was included \$78,000 for the protection and improvement of the Canadian National Railway, and the amount allowed by him for the cost of obtaining the flowage rights was extremely liberal. On the other hand, he included the sum of \$20,000 to cover the cost of providing the necessary water front protection at Fort Frances, which we estimate will cost \$42,000.

Namakan Lake "Up to elevation 508.5 the Namakan chain of lakes has a storage capacity of 30 billion cubic feet. The areas of the additional flowage rights required to raise the level of this basin to 510.0 is estimated to be approximately 1,311 acres in Canada and 4,471 acres in the United States.

"The International Joint Commission has recommended that this basin be raised to elevation 515.0 and to do this, an additional expenditure estimated to now exceed \$150,000 to \$300,000 will be required. A large part of this additional amount would be expended for the construction of dikes and other protective works. Flowage rights required are estimated to amount to approximately 2,000 acres on the Canadian side and 6,000 acres on the United States side.

"Our recommendation, however, does not contemplate any substantial increase in level on the Namakan chain of lakes other than that which may be created by such slight rise in the ordinary high-water mark as might be made at nominal expense for changes to the present dam. Rather than seek any substantial increase in storage on this chain of lakes, we recommend a plan of providing the storage on the waters along the boundary above this chain of lakes. Moreover, the regulative storage thus provided would be susceptible of far more efficient and satisfactory regulation.

Lac La Croix "This lake raised to elevation 1,200 (sea level datum) will have a storage capacity of 27 billion cubic feet. The area overflowed in Canada is estimated to be approximately 3,830 acres, and in the United States 5,300 acres. The cost of this land should not exceed \$35,000. The regulating works at the northern outlet and a crib dam at the western outlet are estimated to cost approximately \$138,710 and \$22,465, respectively, making the total cost of developing this reservoir approximately \$196,175.

Crooked Lake "Raised to elevation 1,260, this lake will have a storage capacity of 7.4 billion cubic feet. The flowage area in Canada is estimated at 1,555 acres, and in the United States, 1,585 acres. The cost of this land should not exceed \$10,000. The cost of the regulating works at the outlet of the lake, chargeable to storage, is estimated to be approximately \$79,750, or a total cost for storage on this lake of approximately \$89,750.

Basswood Lake "At elevation 1,305 this lake will have a capacity of 6.4 billion cubic feet. No flowage rights will be required, as this lake will not be raised above its present high water level. The cost of regulating works, consisting of two dams, is estimated to be \$42,500.

Saganaga Lake "At elevation 1,447, this lake will have a storage capacity of 20.4 billion cubic feet. The area to be overflowed is estimated to be 5,920 acres in Canada and 2,350 acres in the United States. The cost of the flowage rights should be less than \$25,000. The estimated cost of the regulating works, consisting of two dams, is \$72,700. The total cost of developing this storage basin will be approximately \$97,700.

Summary "The additional flowage rights on Rainy Lake to create the additional storage of 24.0 billion cubic feet are estimated to cost \$297,000.

"No additional storage which will create an expenditure is herein recommended on Namakan Lake.

"The following is a summary of the storage capacities and estimated costs of constructing the storage dams and obtaining the flowage easements on the lakes along the boundary above Namakan chain of lakes which have been described:

	Capacity billion cubic feet	Estimated costs
		\$
Lac La Croix.....	27.0	196,175
Crooked lake.....	7.4	89,750
Basswood lake.....	6.4	42,500
Saganaga lake.....	20.4	97,700
	61.2	426,125

"This storage of 61.2 billion cubic feet on the watershed above Namakan Lake is equivalent to a sustained flow of approximately 2,270 c.f.s. for a full 310 days of each year. The additional storage proposed for Rainy lake of 24 b.c.f. herein recommended, is equivalent to a sustained flow on the same basis of 895 c.f.s., giving a total new storage recommended equivalent to 3,165 c.f.s.

"The storage suggested on the lakes above Namakan chain of lakes, in conjunction with the existing storage, will provide a sustained, regulated flow of 3,600 c.f.s. at the outlet of Namakan Lake.

"The present storage on Rainy Lake of 39.0 billion cubic feet and the additional 24.0 billion cubic feet herein suggested, are equivalent to approximately 2,350 c.f.s. sustained flow additional, giving a total reservoir capacity along the

boundary waters equivalent to 4,620 c.f.s., or over 50 per cent on the mean annual run-off from this basin. Further storage is practicable in this watershed on tributaries not along the boundary, which will unquestionably be developed in the future, and thus bring the run-off under a control that is practically absolute.

“Among these are the basins of the following: Vermilion, Maligne, Turtle, Seine, Otukamamoan, Manitou, and Footprint.

Advantages of Control

“The advantages of this lake and run-off control, administered in the public interest, are substantial. It is possible to state in somewhat definite terms the gains that would accrue to power users on the entire reach from these suggested dams down Rainy River, Lake of the Woods and Winnipeg River, to Lake Winnipeg. In the definite consideration of the importance of the storage to these interests alone—which in itself more than suffices to justify the undertaking—the benefits, direct and indirect, to all other public and private interests on each side of the boundary are so definite that they should not be lost sight of. We refer specifically to navigation, lumbering, paper and pulp, general manufacturing, summer recreation, fishing, labour, agriculture, railroads, mercantile, and public advancement, health and sanitation, all of which will benefit through sustained lake levels and uniform run-off control.

“As to the water-power, developed and potential, that would benefit, we submit the following table showing power sites below the proposed storage, which would secure the full advantage of these reservoirs. As these reservoirs above the Namakan chain of lakes would provide for a uniform regulated flow of 3,600 c.f.s. at the outlet of Namakan Lake compared with the present monthly minimum of 1,000 to 1,450 c.f.s. all of the power sites below, using the high figure of 1,450 c.f.s. as the present minimum, would benefit to the extent of an increase in dependable minimum flow of 2,150 c.f.s. In addition, there are water-power sites along the boundary waters above Namakan Lake, which are not capable of practicable development without the storage provisions recommended herein. With these storages, there is here a possible potential of about 25,000 horse-power capable of development.

“All other powers which have been or can be developed without this storage, will be materially increased in primary capacity and value, at a cost for storage which is but a small fraction of the cost of developing equivalent power elsewhere. These powers are:—

Condition	Site	Mean head
Developed	Outlet Rainy lake	32
Raw	Rainy river	12
Developed	Outlets Lake of the Woods	22
Raw	White Dog rapids	55
Developed	Point du Bois	47
Raw	Slave falls	26
Raw	Upper Pinnewa (on Pinnewa channel)	18
Developed	Lower Pinnewa (on Pinnewa channel)	39
Raw	Upper Seven Sisters (on main channel)	29
Raw	Lower Seven Sisters (on main channel)	37
	Equivalent to head on full flow of	62
Raw	McArthur falls	18
Developed	Great (Du Bonnet) falls	56
Raw	Pine falls	37
Total mean head		367

“The regulated flow from the proposed storage reservoirs above Namakan Lake would directly benefit all of these powers to the extent of the increase in dependable minimum flow. It is to the general interest to maintain Lake of

the Woods at the most uniform level consistent with conditions, and this interest is not served by the exclusive use of that body and the present storages, as the sole storage for the powers on the Winnipeg river below.

“ Further, the complete development of the powers on the Winnipeg River, which is now well within reasonable expectation, will demand the utilization of all available storage to meet the uniform power demand. The proposed storage on the boundary waters above Namakan Lake will make available an increase in minimum dependable flow of 2,150 c.f.s. for all these powers, at an estimated capital cost of only \$426,125, or only \$19,800 per 100 c.f.s. It will increase the dependable power at these sites by over 71,700 horse-power continuous (80 per cent efficiency) at a capital cost of only \$5.94 per continuous horse-power.

“ The added storage on Rainy Lake will not only increase the mean head at the outlet, but will also increase the minimum dependable flow at all the power sites below by approximately 900 c.f.s. at an estimated capital cost of \$279,000 or only \$3,000 per 100 c.f.s. It will increase the dependable power at these sites by over 30,027 horse-power continuous (80 per cent efficiency) at a capital cost of only \$9.30 per continuous horse-power.

Similar Developments “ The necessity and desirability of providing adequate storage and regulation of the run-off has been well recognized in other localities, and development along these lines has been undertaken by public and private enterprise. It is interesting to note, in particular, the action taken along these lines in the province of Quebec, which undoubtedly has been fully considered by your Commission. A brief summary may here be helpful for purposes of ready comparison.

St. Maurice River “ A storage dam was built giving a complete control of the headwaters of this stream from a watershed of 3,650 square miles. This has made possible an increase in the minimum flow of the river at Shawinigan from an average of 6,000 cubic feet per second to 16,000 cubic feet per second. The cost of this scheme to the Government was \$2,500,000, or \$25,000 per 100 c.f.s.

St. François River “ This stream drains that section of the province known as the Eastern Townships. Storage dams have been built by the Commission at the outlet of two large lakes, viz: St. François and Aylmer. The minimum flow of the river has been increased by about 900 c.f.s. The cost of these dams has been about \$750,000 or \$83,333 per 100 c.f.s.

Ste Anne (of Beupre) River “ This stream is tributary to the St. Lawrence into which it flows about twenty miles below Quebec on the north shore. Two storage reservoirs have been built to regulate the flow of this stream at a cost of \$350,000. The minimum flow at the Laurentian Company's plant at Seven Falls (head 410 feet) has been increased by 100 c.f.s. at a cost of \$350,000 per 100 c.f.s.

Lake Kenogami (in the Chicoutimi District) “ Lake Kenogami is the source of two rivers where power is generated for the plants of Price Brothers and Company, at Kenogami, and the Chicoutimi Pulp Company, at Chicoutimi. These plants could be operated to full capacity only part of the year. The storage provided by the Commission shall assure a minimum flow aggregating 1,800 c.f.s. for both streams, with the result that the plants shall be operated to full capacity during the whole year. The cost of this storage (just completed) shall be over \$4,000,000 or over \$222,000 for each 100 c.f.s. of total minimum flow.

“ All of the above mentioned storage reservoirs are operated by the Quebec Streams Commission, and the benefiting companies pay an annual charge

sufficient to cover the interest on the capital cost, sinking fund in thirty years, cost of operation and maintenance and a small profit. This policy has proved a great help to the industrial development of the province.

Conclusion "It will simplify the matter of general control of this international watershed, if important matters affecting storage, water levels, outflow and regulation thereof, are left to this Commission to deal with as varying circumstances and conditions may warrant. The division, assessment, levy and payment of the cost of all the proposed work should be in the hands of the Commission. In this assessment, we shall expect that the amounts already expended by us shall be taken into account. On this basis we shall willingly pay our share of the proposed work and shall render energetic aid toward the early consummation of the maximum development, carrying with it the greatest benefit to the peoples of these two countries.

"The benefits to the people of Canada and the United States may briefly be summarized in conclusion. Navigation will be improved and may be revived after having practically passed out of existence for several years. The scenic beauty of the streams and lakes will be enhanced under control and they will become more accessible to tourists and as recreation grounds. The more uniform levels will improve the waters as fish, fowl and game preserves, and for breeding purposes. New wealth in the building up of industries, with all its concurrent and far-reaching possibilities, will be created. The construction of necessary works and power plants is only the first step in bringing into existence that new wealth, which must annually increase as the beneficial results extend to and are enjoyed by an added population of artisans, merchants, manufacturers, and indeed those in every walk of life. The increased wealth of each and every community within this area will be many times the proposed expenditures. Annually and for all time the people of both countries will enjoy its benefits, which in dollars and cents it is almost impossible to estimate."

Recreational Interests Those opposing any change in levels on the lakes under investigation were represented principally by E. C. Oberholtzer, Hugh J. McClearn and George H. Selover. Early in the hearing Mr. McClearn, speaking on behalf of the Arrowhead Association described the nature of these interests that opposed any change in levels. "There are literally thousands of people" he said, "who are interested in these lakes, people from other parts of the United States and from all these cities and villages in Minnesota whom we represent here. They are primarily interested because they are adjacent to and in some instances adjoining these lakes. They are interested in the riparian rights, in the beaches, in the summer resorts. Some of the counties in the so-called Arrowhead District, northeastern Minnesota, have spent millions of dollars in constructing roads from different cities to these lakes. There are many people here who have established summer homes on these lakes because of their beaches, because of their timber, because of their canoe routes, because of all the things that are attractive to summer outings. There are many more from other states in the Union, and, I doubt not, from different provinces in Canada, who come here annually during the summer months and who are interested in these lakes, that the levels be not changed, certainly that they be not changed unnecessarily."

Mr. Oberholtzer in his statement on behalf of himself and various property owners on Rainy Lake expressed the view that the increase in levels could not be of any material benefit to the industrial interests at International Falls and Fort Frances; that it would not be of any benefit to navigation; but would unquestionably benefit companies operating power upon the Winnipeg River and at the outlet of the Lake of the Woods. He put forward the following alternative proposals:

**Alternative
Proposals**

“ We claim that we have another plan for the development of this same region which means far more to the people and is of far more immediate public interest than the plan presented by the power company. It is a plan inaugurated in 1909 by President Roosevelt when he set aside the Superior National Forest. In his wisdom he foresaw that public sentiment was in favour of just such preservation. At the same time by Order in Council, Ontario set aside the Quetico Forest Reserve, one of the most beautiful forest reserves in the north at that time. The people were extremely proud of this at the time because it was the first case of international co-operation for some project of that sort. People had worked from both sides to get this tract of public land set aside for public use and exploitation. This policy has since been extended by some of the states as some speakers have shown, and it is the policy we should like to see continued.

“We believe this region has the possibilities of the Thousand Islands of the St. Lawrence, or northern Maine, of some of the wonderful regions in Europe for recreation. It is a region in which the people have already acquired a public interest by the fact of all these homes, by the fact that people come in here year after year and are coming in more and more every year. They are just acquiring a taste now and it is nothing compared with what it will be in ten or fifteen years. When you destroy the beauty of that region you destroy its utility. The people who come in here are coming in first of all because it is wild and natural, because it is all that a city cannot give them. It is the truest recreation they can get. These people when they buy a site do it in the same way as they buy a site in a city, for some particular feature it possesses. It may be a group of trees, a sandy beach, a beautiful sand point, with a promontory at the end of it. If you destroy that one feature—if the property comprises 100 acres and you destroy only half an acre which contains that essential feature, you destroy the entire value of the land. It has no other value for summer purposes. Its utility may be entirely gone.”

**Izaak Walton
League**

Mr. Selover, who filed protests from members of the Izaak Walton League in Minnesota, Illinois, Iowa, Wisconsin, Indiana, Arkansas and Missouri, described the League as an organization of those “ who want to preserve what little we have left of the outdoors. It has about two thousand chapters over the United States principally in the Mississippi Valley. . . . The national organization has its headquarters in Chicago.” It was at the instance of the Izaak Walton League national organization that Congress passed and the President signed the first swamp salvage act in the history of the country. Swamp lands in the border country were necessary for the preservation of fish life. Drown out the swamps and marshes and you destroy fish life. “ Our plea to you is to help to preserve things as they are unless some over-weening public necessity absolutely demands their use.”

Minnesota

Considerable testimony was submitted on behalf of the State of Minnesota. The Assistant Attorney-General, Albert F. Pratt pointed out that “ There are two things in which this state is vitally interested, that is, in connection with the present situation as well as the proposed raising of Rainy and Namakan Lakes. One is the regulation and control of these two waters; that is, on the waters respectively controlled by the dam at Kettle Falls and the dam at International Falls. We consider that a matter of vital importance to our citizens, to the settlers, to the people living in that territory, and to the state itself. . . . The second matter. . . is the ascertaining of the value of the lands and timber belonging to the state of Minnesota which have been appropriated and taken and for which no compensation has been made.” Mr. Pratt added that the state’s claim would be \$5 an acre as the minimum which would be considered. The state had prepared and submitted to the Commission in

June, 1925, a statement in detail of the areas of land, the amount of timber, and its value, all as estimated, owned by the state, affected by the present situation at the different levels stated therein. Mr. Pratt's comments on these two interests will be found at pp. 356-362 of the International Falls hearing.

Effect on Fish Life The following statement was filed on behalf of the Game and Fish Commissioner of Minnesota:

“Generally speaking, higher water levels are beneficial to fish life. However, any substantial increase in water levels over and above that ordinarily maintained in a state of nature over a long period of years will naturally destroy the natural spawning beds of fishes of the shallow water spawning species, as well as the aquatic plant life found in such shallow waters, and no one can foretell how many years will be required to re-establish or develop new and proper spawning places. In addition there is involved the problem of the development of plant life, not only that vitally necessary and essential in the life of all species of fish at certain periods of life of each, but that upon which migratory birds are dependent for food supply during breeding season, but during flight as well.

“Generally speaking, it is not high water levels which are destructive to fish and aquatic plant life, but rather a varying and irregular artificial change of water depths and levels. For example, if the normal or average water level in a lake or stream be taken at benchmark 500, and through the construction and operation of a dam the water level behind or above such dam be raised 15 feet or to benchmark 515, such level maintained for a period of, say, weeks or months, and then lowered to benchmark 505, or lowered 10 feet, such radical and artificial variation in level would prove, and has by experience been proven, to be absolutely destructive to fish and plant life.

“As a concrete example, conditions prevailing in the head waters of the Mississippi, occasioned by the so-called flood control reservoir dams, maintained the past few years by the federal government may be cited, as well as the situation in lake Kabetogama developed by the operation of the Kettle Falls dam. As a result of the failure on the part of the Government to maintain a uniform state of water in the head waters of the Mississippi, pike and other species of fish are rapidly disappearing and the game and fish department has experienced great difficulty in obtaining a sufficient amount of spawn the past two years to operate its pike hatcheries particularly at their maximum capacity; in fact, in the spring of 1925 the hatcheries were only operated at 49 per cent of the maximum capacity, and therefore the production of pike fry was 49 per cent of the 1924 output.

“Shallow water spawners of the finny tribe can easily adjust and accustom themselves to changing water conditions brought about by spring floods and abnormal precipitation at other seasons, but cannot do so when abnormal artificial conditions are developed. Therefore, if a reservoir or storage project affecting the boundary waters is ultimately looked upon with favour, it is hoped that a maximum height or water level in each chain of lakes affected by the construction of a dam, and a not materially lower minimum height or water level in each chain may be prescribed to be maintained in the chain of lakes; in other words, that a uniform stage of water will be available and provided throughout a twelve months' period, and that such maximum and minimum water level provisions be rigidly and permanently enforced.

“In the absence of profiles and contours of the probable affected territory, it is hoped that the game and fish department may be given an opportunity to analyse the findings of the Commission's engineers and make comment thereupon before the Commission makes its final report.”

Conservation of Area The following statement was filed on behalf of the Commissioner of Drainage and Waters of Minnesota:—

“ The following preliminary memorandum is submitted stating generally the position taken, on present information, by the Department of Drainage and Waters, State of Minnesota, with respect to the subject matter referred to in notice of hearing, Rainy Lake levels, of date August 15, 1925, for hearing before the International Joint Commission on September 28, 1925.

“ 1. So far as I have been able to learn there is not available anywhere, unless with the Commission, data on which may be based an intelligent and convincing discussion of the questions submitted in the Commission's notice of hearing, Rainy Lake levels. Their report on Lake of the Woods levels published in 1915, contains some information on Rainy, Namakan and Kabetogama Lakes but none on the lakes and boundary waters lying easterly of these lakes. It must therefore be presumed that the hearing on the 28th is more for the purpose of securing an expression of sentiment from the several interests on both side of the line concerned as to the general advisability of permitting the use of the boundary waters for the purposes suggested by the questions in Commission's notice of hearing, and that further opportunity will be given to approve or disapprove the merits of any particular plan or plans that may be presented at the hearing after the actual facts have been ascertained.

“ 2. The determination of the economic advisability of converting these boundary waters into the kind of impounding reservoirs for water-power development suggested in the Commission's notice involves a consideration of several important factors. The location of the power developments and the industries to be served by them will be a measure of the added benefits to the communities in the form of taxes, business opportunities, employment, etc. Where two separate nations are involved, this question becomes especially important. The purposes for which the power is to be used, whether for private enterprises or public utilities, has a direct bearing on the amount and extent to which the general public may be expected to benefit. If the power is to be used for the promotion of private enterprises will the demand for it be permanent and will there be a ready market for it within economical transmission distances after the immediate purposes for which it may have been developed have been served? And lastly will the communities and peoples of the two nations involved benefit more from these proposed power developments than from a complete and full utilization of these waters for the purposes for which they are suited as they exist in a state of nature?

“ 3. This last question implies that a conversion of the boundary waters into artificially controlled storage reservoirs will injure or destroy them for the purposes they serve in their natural state. That the artificial raising of a lake to high and unnatural elevations to be followed by the lowering of it to its extreme low stages within a range of six months will seriously disturb natural conditions within and around the lake, will be conceded without argument. Some of these lakes fluctuate many feet in their natural state. Natural fluctuations from extreme high to extreme low stages, however, take place through long periods and correspond to cycles of years of high and low precipitation. Fish life dependent on natural stable conditions for its perpetuation and propagation is given an opportunity to adjust itself to natural gradual fluctuations. On the other hand, in order that a lake shall function ideally as a storage reservoir for the creation of additional power, it must be operated so as to have it at its lowest stage about the time of the melting of the snow and the spring rains, and to have it filled to its maximum capacity about the middle of July or first of August of each year. If the fluctuations permitted under such control are considerable, fish life will be seriously menaced if not entirely destroyed.

"4. The natural shore lines of these bodies of water have been formed through geologic ages and their value may be said to consist in their rugged, wave-worn outlines and in the demarcation which the wave action has formed between the waters edge and the line of vegetation. The size and kind of forest growth is largely that which has been encouraged by conditions which have existed because of past lake stages. A material raising of the surface of the lakes will destroy these outlines and will create a new shore line extending over surrounding meadows and into bordering forests. It will take years for a lake under these artificial conditions to restore anything like attractive surroundings especially when its surface elevations will be fluctuated through long ranges as would be the case in artificially controlled impounding reservoirs.

"5. Generally speaking this entire region is sparsely settled with some areas not even remotely explored. Logging operations are fast removing the available commercial timber. The section as a whole does not adapt itself to development by colonization methods. The soil is poor, being largely granite outcrop boulders and gravel, unfit for ordinary agricultural pursuits. Nowhere in this country is there a natural setting which so strikingly typifies the effects of a combination of forests, lakes, islands and cliffs as may be found within the Arrowhead region in Minnesota. California has sold itself to the American people as a place to which those who can afford it may go to spend the winters. Why cannot this region sell itself as a place to which the sweltering Californians and others may come to spend their summers? I believe it can be shown to be a fact that the country knows little about the recreational values of this region, and that the future tourist business that stands to be developed by its natural attractions will be second to none of any forms of industry that may be built up as a result of additional water power development.

"6. The development of water power on streams wherever natural conditions makes this economically advisable, and where as a result of such power the needs, conveniences and contentment of the people of the surrounding communities may be better served is a meritorious and legitimate undertaking. Coal is here lacking and wherever its need may be supplied by water power and the saving in power production thus made reflected in cheaper and better service to the general public, the value of water power should be given its weighted place with other uses to which the waters of this region may be put.

"7. But as against the value of water power, which may usually be determined in a practical and definite way, what is the value of this region as a recreational and playground? The practical conservationist must ask himself and answer the questions: How should the natural resources of this region be evaluated now for the purposes they will best serve for present and future generations? Will the use of these waters for the promotion and development of private industry along the lines indicated in the Commission's notice of hearing be reflected in greater benefits to a greater number of people in Minnesota and the United States than what can be realized from the use of the waters in their natural state? The business that may be built up by tourist trade, without considering the intangible recreational benefits to be enjoyed by the visiting tourists, is, in my opinion, sufficiently real and specific, and may be determined and expressed in sufficiently tangible terms to merit their serious comparison with the results that may be obtained from water power development. Opportunity to offer such a comparison should be given by the Commission after the facts with respect to the proposed scheme of water power development have been made available."

Manitoba The province of Manitoba was represented at the hearing by its Attorney-General, R. W. Craig; the city of Winnipeg by J. Preudhomme, and the Winnipeg Electric Company and Manitoba Power Company by B. E. Guy.

Mr. Craig emphasized the general understanding at this hearing that it was in the nature of a preliminary inquiry into the situation with a view to determining what interests would be affected, what their views were as to the possible effect of the proposals, and that a subsequent opportunity would be afforded all interested parties to furnish evidence and present arguments.

He expressed the view that the proposals involved in the Reference would be of no immediate or direct benefit to the province of Manitoba, or the interests within its borders. As to the further question, under what conditions might it become practicable and desirable to regulate the levels and provide storage facilities, he said that that was being investigated by Manitoba interests and the result of their inquiries would be put before the Commission at a later date.

Winnipeg Mr. Preudhomme on behalf of the city of Winnipeg filed with the Commission the following statement:—

“The city of Winnipeg submits:

“1. That the existing works at Rainy and Namakan Lakes were not constructed with a view to regulating the levels of the lakes or storing the waters thereof in the interests of the power sites on the Winnipeg river in Manitoba, but the existing elevation was fixed to provide suitable and adequate storage in the interest and for the special benefit of the owners of said works without giving the city of Winnipeg an opportunity of being heard in connection therewith.

“2. That the city of Winnipeg has not in the past or does not at present need the benefit of existing storage on Rainy and Namakan Lakes and therefore should not pay for any damages already accrued therefrom.

“3. That if any attempt be made to consider the distribution of the costs of existing storage among the owners of sites on the Winnipeg River in Manitoba, the whole question of the proper elevation of the waters of Rainy and Namakan Lakes must be considered *de novo*, as if the existing levels and storage had never existed.

“4. If the questions of the benefits to the city to be derived from, and the assessment against the city of any of the costs of existing storage on Rainy and Namakan Lakes are to be considered, the Commission must consider whether or not the existing elevation is unnecessarily high to provide the storage required by the city's plant at Pointe du Boise.

“5. That it has not been shown and it is doubtful if any of the damages or compensation payable in consequence of the existing storage on Rainy and Namakan Lakes or either of them, or any of the damages which it is estimated would result from any increase of such storage, or from storage on the upper boundary lakes were to be assessed against the City of Winnipeg, the benefit it is estimated might be derived from such storage would be commensurate to, or justify the payment of the assessment.

“6. That by regulating the waters of Rainy and Namakan Lakes at ranges between elevations lower than the existing storage thereon, and by regulating the upper boundary waters at ranges between elevations lower than those proposed, the city of Winnipeg might obtain adequate storage thereof equally advantageous and more economical to the city than is possible under the existing or any increased elevation of the said lakes; and all parties, except the owners of the existing works, would thereby secure more advantageous use of the boundary waters flowing into and from Rainy Lake than is possible with the existing storage.

"7. In considering the question of the distribution of the cost of existing storage on Rainy and Namakan Lakes, special regard must be had to the past regulation and use of the waters thereof and to the fact that the full benefit thereof has accrued solely to the owners of said works.

"8. The city of Winnipeg is advised that it might be possible to obtain equally advantageous storage in other waters in the Province of Ontario in Canada, at less cost than the cost of existing storage or the estimated cost of increased storage on Rainy and Namakan Lakes.

"9. Owing to lack of adequate data it is impossible to deal definitely and effectively with the questions of—

- (a) The benefit to be derived by the city of Winnipeg from additional storage on Rainy and Namakan Lakes and on the upper boundary lakes, or
- (b) The method or system of regulation possible and advisable for storage on these waters, or
- (c) The method of administrative control for the operation of said storage reservoirs, or
- (d) The attitude of the city of Winnipeg towards assuming a portion of the costs of additional storage on these waters.

"10. The city of Winnipeg, however, takes the position and submits that no storage should be undertaken or provided which would result in imposing upon the city any burden in the form of payment or compensation or in any other form. If nevertheless such storage is undertaken and burden imposed the city should not be required to assume any portion of such burden out of proportion to the value to the city of any increase in the dependable flow of water in the Winnipeg river, having in mind the other sources from which it is possible for the city to obtain adequate storage and resulting flow."

**Winnipeg
Electric and
Manitoba Power
Companies**

Mr. Guy said that the position of the Winnipeg Electric and Manitoba Power Companies was substantially the same as that presented by the Attorney General. "We are not" he said, "in a position to say what benefit we might expect to derive from additional storage on Rainy and Namakan lakes and on the upper boundary lakes under some approved system of regulation. We are doubtful if any benefit would accrue. We are not asking for and do not desire any additional storage, or suggesting that any should be provided on the waters in question."

As to the question of benefits derived from present storage, he said: "My companies take the very strongest grounds that under no circumstances at present known to them will they agree to contribute anything towards the cost of the works heretofore erected."

**Canadian
National
Railways**

The interests of the Canadian National Railways in the investigation was set forth by their counsel, George Wilkie in a statement which will be found at pages 29-30 of the 1925 *Hearings*, and in his testimony on pages 273-88 of the same hearings.

Fort Frances

Mr. H. A. Tibbetts on behalf of the town of Fort Frances said that while they fully appreciated the advantages to the town of Fort Frances in the development of water power, the damage to the town from higher levels had been greatly underestimated. Mr. Tibbetts explained the effect on Fort Frances of higher levels on Rainy Lake and filed a statement which will be found on pages 370-74 of the 1925 *Hearings*.

A resolution adopted at a mass meeting of citizens of the town of International Falls, Minnesota, protesting against any change in levels of Rainy Lake, will be found on page 57 of the *Hearings*.

OTTAWA HEARING

A hearing was held in Ottawa, on October 4, 1932, at which in addition to the engineers in charge of the investigation for the Commission, and their assistants, Canada was represented by Mr. J. T. Johnston, the State of Minnesota by the Assistant Attorney-General, Mr. Chester S. Wilson, the Director of the Division of Drainage and Waters of the Department of Conservation, Mr. E. V. Willard, the Deputy Director of the Division of Forestry of the same Department, Mr. Arthur F. Oppel, and Mr. B. F. Case, representing the State Auditor. The Receivers of the Minnesota and Ontario Paper Company were represented by Mr. W. O. Rogers, their Counsel, and Mr. Adolph F. Meyer, their Engineer. Mr. Frederick S. Winston appeared on behalf of the Quetico Superior Council.

Policy of Receivers Mr. Meyer stated at the outset that the Receivers had not yet been able to determine upon a policy looking into the future. He, however, gave the Commission the benefit of his own views as to what was practicable and desirable. Generally speaking it was his judgment that a project might be adopted involving much less storage and variation in lake levels and power development than was proposed in the report of the Commission's engineers. In his view the recommended plan would not justify the expense.

Mr. Meyer said that he had been personally considering primarily the development of water-power at Lac la Croix, which involved the possibility of diverting water to the boundary in order to afford a more economical development. It was also possible, he pointed out, to divert water from the Namakan river and develop it economically in Canada.

To a question by Mr. Stanley as to whether or not there were other practicable diversions along the boundary, Mr. Meyer replied, "Particularly in lac la Croix 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 la Croix development."

Speaking for himself and the Receivers, Mr. Meyer said: "We cannot 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 premise."

Based more or less on this situation outlined by Mr. Meyer, much of the hearing at Ottawa in October, 1932, was devoted to discussions by the various engineers as to technical points, and a more or less unsuccessful attempt to reconcile their differences.

Minnesota Mr. Wilson, on behalf of Minnesota, set forth at considerable length the position of the state and its interests in the subject-matter of the Investigation.

"May I say at the outset in order that the Commission may get a picture of the state interests, 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 aggregate 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."

Canada Mr. Johnston pointed out that there were a large number of interests on the Canadian side, federal and provincial, that were affected by the questions before the Commission, and stated that preliminary steps were being taken to co-ordinate their ideas and prepare for a final hearing.

Quetico Superior Council Mr. Winston made a brief statement on behalf of the Quetico Superior Council, but as the point of view of these and other recreational interests was set forth in much more detail at the final hearing in Minneapolis, it does not seem necessary to give it here.

It may be noted that much of the technical discussion by the engineers at this hearing had to do with the effect of higher levels on Rainy and Namakan Lakes. At the final hearings the Receivers of the Minnesota and Ontario Paper Company made it clear that they were no longer interested in further storage on Rainy and Namakan Lakes.

STATEMENT OF RECEIVERS

On March 23, 1933, a statement was filed with the Commission on behalf of the Receivers of the Minnesota and Ontario Paper Company. This statement is limited to a discussion of Questions 1 and 2 of the Reference.

The statement explains the origin of the receivership and argues that the Reference was not initiated by the Minnesota and Ontario Paper Company, but grew naturally out of the terms of the Final Report of the Commission in the Lake of the Woods Reference.

The statement has this to say as to the interest of the Receivers in future developments:

"Because of the location of the power development at International Falls at the lower end of the watershed, the receivership estate is interested in future developments in the upper watershed as well as in the preservation of existing rights and properties. The plant at International Falls has been equipped with auxiliary steam power. If the dependable flow can be increased, or other

hydraulic power provided, at a reasonable cost to eliminate steam power, the interests of the receivership estate will be advanced. The mills were designed and built on the assumption that much more power would be available than has in fact been available. Ten thousand additional horse-power is needed on the United States side to utilize the manufacturing facilities already provided. Ample power is available on the Canadian side since the construction of the Seine river plants.

Boundary Waters In bringing forward a project on behalf of the Receivers, the statement has this to say as to what constitutes boundary waters:

“It is submitted that boundary waters remain boundary waters until they finally leave the boundary, irrespective of whether or not these waters, at any given point, flow in equal volume on both sides of that imaginary line which constitutes the international boundary, or whether they flow in unequal volume on the two sides of the boundary. Boundary waters are still boundary waters, even though part of those waters flow in a channel through which the boundary passes and part of the waters flow through a Canadian channel, or through a channel entirely within the United States. Boundary waters remain boundary waters even though those waters are separated by a small island, one side of which borders the international channel and the other side borders a Canadian or a United States channel. Boundary waters remain boundary waters whether the island dividing those waters into two channels is a small island or a large one; whether the two or three channels through which the water flows are a few hundred feet long, a few thousand feet long, or several miles long. Water which once is boundary water remains boundary water insofar as its use under the treaty is concerned, no matter where the water flows, until it finally leaves the boundary and flows through either Canada or the United States to its ultimate destination in the ocean. Once the water has permanently left the boundary to flow through one country, all rights to its use by the other country must inevitably cease.”

Receivers' Project The project proposed by the Receivers in this statement is outlined as follows:—

Rainy and Namakan Lakes No additional storage is suggested unless other interests benefited will pay all costs in excess of \$250,000. Storage benefits to water-power at International Falls and Fort Frances are limited to about 5 per cent of total instead of 25 per cent as stated in 1932 report.

Loon River “Build power and navigation dam at head of Little Vermillion Lake, crest elevation 1,158, making Loon River navigable by raising river to level of Loon Lake.

“Remove old logging dam at outlet of Loon Lake, restoring lake to its natural level and provide channel to carry 3,000 c.f.s. at elevation 1,157.

“Clear 1,200 acres of barren, burned-over, rocky land along Loon River to elevation 1,160.

“Build power plant to utilize 2,000 c.f.s. under 42 feet head, developing 7,500 horse-power.

“Provide log sluice. Provide crane for lifting small boats to upper level for navigation to Beatty's Portage at Lac la Croix. Maintain lake at substantially uniform level throughout navigation season.

“Estimated cost of project, \$960,000 including 55 miles transmission line to International Falls.

Lac la Croix “At outlet of lake in Namakan River, build free overall spillway about 420 feet long and 6 feet high with crest at elevation 1,186, which is below ordinary high water mark. Provide log sluice.

“Build block dam in high water channel at Beatty's Portage, and excavate channel to carry 6,000 c.f.s. at elevation 1,186.

“Provide log sluice and waste gates for controlling flood water; total discharge capacity of water to be greater at all lake stages than natural discharge capacity.

“Utilize natural storage capacity of lake between 1,186 and extreme natural high water mark of 1191·00 as flood reserve to same extent if necessary, as nature utilized it.

“Build power plant at Beatty's Portage to utilize 2,000 c.f.s. under 29 feet head producing 5,500 horse-power.

“Maintain substantially uniform level of 1,185 to 1,186 throughout navigation season and then gradually draw lake down to receive spring inflow, reaching normal level about June 1.

“Estimated cost of project, \$340,000.

Upper Lakes (a) *Basswood*.—“Replace present rock-fill dam at outlet with either a free overall spillway having a long crest at elevation 1301·5 for passing flood water, together with a narrow, deep free-overfall section through which the temporarily stored water will gradually be discharged after flood has passed, or install waste gates for handling flood water and maintaining lake at substantially uniform level during navigation season.

“Utilize natural storage capacity of lake between 1301·5 and natural high-water mark of 1305·3 as flood reserve to same extent, if necessary, as nature utilized it.

(b) *Saganaga*.—“Build control dams both at outlet and on high water overflow channel to maintain lake during navigation season at substantially uniform level of 1,432, which is below ordinary high-water mark.

“After close of season draw lake down gradually to receive spring inflow and reach normal level about June 1. Utilize natural flood storage capacity up to natural extreme high water mark of 1,435·3 as a flood reserve.

(c) *Northern Light*.—“Build dam at outlet and control this lake below its ordinary high water mark of about 1,443 in the same manner as Basswood and Saganaga are controlled. Utilize natural flood storage capacity up to extreme high water of about 1,445 as a flood reserve.

(d) *Crooked Lake*.—“The economic feasibility of this power project is questionable unless flowage over nearly worthless land can be secured at reasonable cost and clearing is limited to cutting off timber. Briefly the project is this:

“Raise lake from ordinary high water level of about 1,251 to elevation 1,270.

“Lower Iron Lake a few feet.

“Clear about 2,500 acres of rocky land that will be flooded.

“Build free overfall spillway above Curtain Falls to control flow and yet maintain beauty of falls.

“Build power plant on high water channel in the United States.”

Effect on Other Interests

The Receivers recognize three other interests in the area covered by the investigation, more or less antagonistic to their own. As to the effect of the suggested project upon these interests the statement says: “It is the belief of the Receivers that much more uniform stages will prevail during the tourist season under the plan herein proposed than prevail in a state of nature. Loon River will be greatly improved from the

scenic and navigation point of view. In short, it is believed that fairminded recreationists should concur in this plan." As to the interests of the state of Minnesota, the statement says: "Under the plans proposed the water in none of the lakes will be raised above high-water mark. Some land will be overflowed on Loon River, but it is barren, burned and cut-over, and rocky, and the state holdings in that area are negligible in extent." So far as the interests of settlers are concerned, the Statement says: "So far as the Receivers are advised, no settler would be damaged by the developments here proposed. As in the case of state lands, the Federal Government has the paramount right to regulate international waters up to high-water mark, the maximum limit proposed."

Rating Curves Following the Ottawa hearing, October 4, 1932, Mr. Adolph F. Meyer filed with the Commission a statement in regard to "Rating Curves of Outflow from Rainy Lake in a State of Nature."

WASHINGTON CONFERENCE

At Washington on April 5, 1933, representatives of the Receivers of the Minnesota and Ontario Paper Company were given an opportunity of discussing and explaining the report filed on behalf of the Receivers and dated March 23, 1933.

Mr. R. H. M. Robinson, one of the Receivers, spoke briefly as to the interests of the Receivers and their relationship to the Minnesota and Ontario Paper Company and its subsidiaries.

Mr. W. O. Rogers, Attorney for the Receivers, discussed some of the questions involved in the investigation from the legal point of view, and outlined the proposals of the Receivers. He said among other things that the Receivers were not now interested in further storage on Rainy or Namakan Lakes, but wished to retain their present elevations. Their projects with reference to the lakes above Namakan were primarily power projects. They were not greatly interested in storage on the upper lakes.

Mr. Meyer discussed the engineering side of the proposals of the Receivers. "We have tried" he said, "to present here a project that we believe is economically sound, something that can be carried out when conditions warrant it. I make that statement so that it may be clear as to why we are now recommending a project which involves the development of only about 15,000 horse-power and which involves the creation of a very small amount of storage as against the recommendations made in 1915 and 1917." Elsewhere in reply to a question, Mr. Meyer indicated that the earlier proposals had contemplated a maximum development of 40,000 to 50,000 horse-power from all the boundary lakes.

Costs Discussing costs Mr. Meyer said: "We have worked out a project here which will deliver power at International Falls at a price which will permit its use in paper making. You cannot pay for power for paper making what you might pay for power used for utility purposes. . . . We estimate that the hydraulic development alone will be between \$15 and \$16 per horse-power, and when supplemented by the steam power to make it all firm power, \$22.50. Any larger power project would raise the cost of the power to a point where it is prohibitive."

Mr. Meyer also argued that the present storage was of very substantial benefit to navigation and to all of the summer resorts and recreational interests, around Rainy Lake.

**Benefit to
Winnipeg River** He was also of the opinion that the storage proposed by the Receivers would benefit the plants on Winnipeg River. In this connection he said: "I might put it this way. The storage on Lac la Croix alone can increase the flow for power purposes down the Loon River and through the two developments to the extent of 500 to 600 cubic feet per second. The benefit on the Winnipeg river will be an increase in flow of somewhere from 80 second feet to possibly 150 second feet or at the outside in certain periods 200 cubic feet per second, because it is spread out over a longer period of time. Otherwise, the benefit to the Winnipeg River plants would be relatively greater. It is not measured by the increased flow at the outlet of Lac la Croix but only by the increased flow at the outlet of the Lake of the Woods.

"The storage on La Croix, for example, and Loon, suggested in this project would be the equivalent of about, roughly speaking, three inches on Lake of the Woods, and would help Lake of the Woods and the Winnipeg river plants to that extent."...

"In the case of the La Croix project we have suggested that United States interests, either ourselves or we will say someone on the range—we are not limiting it to ourselves—that the United States interests might have the use of all that power in exchange for the power which will be developed on the Winnipeg river from the storage that will be provided; and that in that connection if the United States interests pay the entire cost of the reservoir and Canada gets the benefit on the Winnipeg River, it may also not be out of place to suggest that on the Long Sault Rapids in the Lake of the Woods settlement the United States relinquished the right to several thousand horse-power and possibly to the three or four feet of head which makes that development practicable or not practicable.

Long Sault "In other words, it is not only three and a half feet of head that has been lost at the Long Sault Rapids, but the head that has been reduced from that which it is considered practical to develop to a head which it is considered impractical to develop. We are just suggesting that that might also be considered in this connection; that the United States in that matter did relinquish a certain amount of power at the Long Sault Rapids. Then we might balance what Canada gets on the Winnipeg river with what Canada received through the raising of the Lake of the Woods and the United States relinquished at the Long Sault Rapids, and in consideration of the payment of the entire cost of the project that Canada relinquish her share, whether all or half of the power at the outlet of Lac la Croix.

"One other consideration there. Here is this container of this boundary water—Lac la Croix. Three things are necessary. The United States and Canada together contribute the container to equalize the flow. Shall Canada secure that benefit if development is made on the Namakan River as against on the boundary?

"There is the physical situation of the fall, the second element; and the flow of the water is the third element. The physical condition at the boundary is most favourable to the development of power in the interest of both countries and in the interest of improvement of navigation on the Loon River.

"So entirely aside from what may be legal rights and technicalities, looking at it from a practical standpoint, it seems to us, having in mind all these considerations; power on the Winnipeg river and at the Long Sault Rapids, the fact that the United States contributes part, the physical conditions at the boundary that make the project practical, and the improvement of navigation on the Loon River; we believe all these considerations should be kept in mind in disposing of this question as to whether or not it should be permitted."

FINAL HEARINGS—WINNIPEG AND MINNEAPOLIS

Final public hearings in the Rainy Lake Investigation were held in the city of Winnipeg, Manitoba, October 5th and 6th; and in the city of Minneapolis, Minnesota, October 9th to 12th inclusive, 1933.

At the Winnipeg hearing, appearances were entered on behalf of the Governments, or departments thereof, of Canada, Minnesota, Ontario, and Manitoba; of the Receivers for the Minnesota and Ontario Paper Company; of the City of Winnipeg, the Winnipeg Electric Company, the Manitoba Power Company, the Northwestern Power Company, the Canadian National Railways, the Town of Fort Frances, Ontario, J. A. Mathieu Lumber Company and its subsidiaries, the pulp and sulphite workers of Fort Frances, and the Quetico-Superior Council.

At the Minneapolis hearing, appearances were entered on behalf of the Governments, or departments thereof, of Canada, Minnesota, Ontario, and Manitoba; of the municipalities of Winnipeg, Fort Frances and International Falls, Minnesota, and the county of Koochiching, Minnesota; of the Receivers of the Minnesota and Ontario Paper Company, and of Mr. E. W. Backus; of various trade and labour organizations of International Falls, the Quetico-Superior Council, the Izaak Walton League and the Minnesota Division thereof, of the Arrowhead Association, the Minnesota Division of the American Legion, the Ely Commercial Club, the Engineers' Club of Minneapolis, the Minnesota Conservation Council, and various other organizations and individuals.

Testimony and arguments were presented and briefs filed on behalf of these interests at the hearings in Winnipeg and Minneapolis, a complete report of which will be found in the Record (not yet printed) and which are briefly summarized in the following pages.

Position of Receivers At the outset it is important to note that the statements put forward on behalf of the Receivers of the Minnesota and Ontario Paper Company, in March, 1933, and discussed at the hearings in Washington on April 5, 1933, and also at the Winnipeg and Minneapolis hearings, threw an entirely different light upon the situation from that presented by Mr. Backus at the International Falls hearing in 1925.

At the Winnipeg hearing, Mr. Rogers commented upon criticism of the proposals of the Receivers to the effect that while modifying in some respects the proposals presented by Mr. Backus in 1925, they retained the essential features of the original proposals, and that the Receivers' statement of March 23, 1933, indicated no substantial change in attitude from that revealed in 1925, and during the period when the company was under private management. Mr. Rogers made the following statement:

No Change on Rainy or Namakan "The earlier proposals contemplated three feet additional storage on Rainy Lake. The Receivers advocate no change on either Rainy or Namakan.

"The earlier proposals contemplated regulation of Lac la Croix at levels considerably above ordinary high-water mark, the recreationists claiming that many beautiful islands would be destroyed thereby. The Receivers advocate regulation of Lac la Croix below ordinary high-water mark, and below the timber line, and not a single island will be affected.

"The earlier proposals contemplated a development on Little Vermilion Lake at such elevations as to create considerable flowage. The Receivers' proposal will confine the flowage to a small area of unsightly land with the result that Loon River will be converted from an eyesore to a beautiful, navigable body of water.

"The earlier proposals contemplated considerable development of the upper waters. The Receivers advocate no such development, and suggest only such regulation as may be desired for recreational purposes.

"Those who criticise the earlier proposals claim that they contemplated that the work be largely financed by the two Governments. The Receivers propose that the projects they advocate be paid entirely by the interests developing them.

"Much criticism is levelled at the Lac la Croix project, chiefly due to misunderstanding of it. The proposed regulating work there is intended merely to keep that lake from falling during the summer tourist season and to discharge the excess water gradually during the fall and winter months so as to bring the lake to its natural low level by April 1, ready to take care of the spring inflow. During April and May the excess inflow would be stored so as to bring the lake to its regulated level by about June 1st. In time of flood the regulated level would usually be lower, and never higher, than if no dams had been built. The proposed regulated level would be nearly six feet below the high-water mark clearly visible on the rocky shore of the lake, and fourteen feet below the level suggested in 1925."

of Benefits Commenting again on the Receivers' statement of March 23,
No Assessment 1933, Mr. Rogers said:—

"Since the preparation of this statement we have learned of one other point upon which it would be helpful for the Receivers to make a definite statement, and this is in connection with the assessment of benefits from the present storage on Rainy and Namakan lakes. Although the Receivers believe that many interests have been benefited by this storage, they recognize the difficulty of determining and assessing such benefits. The Receivers have, therefore, determined they will not ask this Commission to determine or assess such benefits. In view of the fact that the Receivers do not believe additional storage on Rainy lake or on Namakan lake should be recommended by the Commission, and we understand that no other interested party is asking for such additional storage, we suggest that this inquiry should be limited to storage on all waters above Namakan lake."

Mr. Backus Mr. E. W. Backus, in his testimony at Minneapolis, explained the relationship between the interests he represented and the Receivers, and his views as to water-power development. He said: "I do not represent the Receivers of the Minnesota and Ontario Paper Company... I represent the Backus Company myself... The titles to these properties and the dam sites so far are not in receivership and any decision the Commission gives will not be affected by the receivership... The developed dams are owned by the Minnesota and Ontario Paper Company and its subsidiaries; on the Canadian side by the Minnesota and Ontario Power Company. The Kettle Falls dam on the Canadian side is owned by the Ontario and Minnesota Power Company... The present dam sites are largely owned by the Backus-Brooks Company which is in a position to go ahead with developments... the sites on Vermilion River and elsewhere... also the flowage rights."

Speaking in regard to his present plans, Mr. Backus said: "At the hearing in 1925 the suggestion I made at that time was to start in at Little Vermilion and go clear through to the headwaters, but owing to the opposition and the situation we decided to start in on the basis of a development at Little Vermilion Lake and Lac la Croix... I realize fully that this project depends entirely upon the cooperation of the Province of Ontario for the diversion of the water through the international boundary channel."

Mr. Backus said that he agreed with Mr. Meyer's plan of development. "Mr. Meyer has been extremely conservative in his estimate (of available power) because he has assumed firm power the year round."

Quetico-Superior Council

Mr. E. C. Oberholtzer read the following statement:—

“The Quetico-Superior Council respectfully requests that in response to the Questions of the Reference, the International Joint Commission make the following findings and recommendations to the two Governments:

“(1) That no elevation of the levels of Rainy Lake, Namakan Lake or the waters controlled by the dams at Kettle Falls be authorized or permitted in excess of the elevations of said waters respectively specified in Question 1 of the Reference.

“(2) That the existing dams on Rainy River and at Kettle Falls be regulated in such manner as not to permit the upper limit of the ordinary range of levels to exceed elevation 1105·6 sea level datum for Rainy Lake (494 D.P.W. datum) and elevation 1117·1 sea level datum for Namakan Lake (505 D.P.W. datum).

“(3) That the existing dams be placed under the jurisdiction and control of the International Joint Commission or of a body analogous to that controlling the waters of Lake of the Woods, with full power to compel the regulation of the dams in the public interest with respect to minimum as well as maximum elevations, so as to avoid sudden extreme and unseasonal fluctuations in water levels, and to avert or minimize such flood conditions as prevailed in 1916 or 1927.

“(4) That no erection of further dams and no additional artificial control of boundary waters be authorized or permitted.

“(5) That the sole beneficiary of the present storage on Rainy Lake and the waters controlled by the dams at Kettle Falls has been the Minnesota and Ontario Paper Company and its subsidiaries.

“(6) That no part of the cost of present storage be assessed, directly or indirectly, against the Dominion of Canada, the province of Ontario or the province of Manitoba, or against the United States or the state of Minnesota.

“(7) That as a condition of the continued operation and maintenance of the existing dams, and in consideration of the continued use of the international waters controlled thereby, the Minnesota and Ontario Paper Company be required to pay just compensation for all damage to public and private property caused by the erection of the dams and just compensation for all flowage easements claimed or acquired.

“(8) That ‘in order to secure the most advantageous use of the waters of Rainy Lake and of the boundary waters flowing into and from Rainy Lake’ and ‘in order to secure the most advantageous use of the shores and harbours of both Rainy Lake and the boundary waters flowing into and from the lake’; the Commission recommend to the consideration of the two Governments the advisability, with proper reservations as to the rights and sovereignty of all the governmental units concerned and upon the full consent of the province of Ontario and the state of Minnesota, of a treaty applying to the Rainy Lake and Pigeon River watersheds and providing for the following main objectives:

“(a) That Park-Line conditions, free from logging, flooding, draining, and all other forms of exploitation be established and maintained on all visible shores of lakes, rivers and islands under public control.

“(b) That all the hinterlands, not visible from the waterways, be administered under modern forest practices for the continuous production of a maximum timber supply.

“(c) That all game, fish, fur-bearers and other wild life be developed for maximum natural production.

“(d) That these ends be pursued under the guidance and direction of forest, park and biological authorities from both countries.”

Canadian Interests Canadian federal interests in the subject-matter of the investigation included those of the Department of Indian Affairs, the Department of Public Works, and the Water Power and Hydro-metric Bureau of the Department of the Interior. The Governments of the provinces of Ontario and Manitoba are also concerned, as well as the Canadian National Railways, the Winnipeg Electric Company, the Manitoba Power Company and Northwestern Power, Limited, the city of Winnipeg and the town of Fort Frances, and some minor interests. Testimony, either oral or in the form of briefs, or both, was submitted on behalf of all these interests, and their points of view, which to a large extent had been harmonized before the hearings, were summed up by Mr. J. E. Read, counsel for the Dominion Government.

Indian Affairs On behalf of the Department of Indian Affairs it was said that no material benefit would accrue to the Canadian Indian Reserves in the area by providing the suggested storage and regulation facilities on Rainy and La Croix Lakes. On the other hand, the lands and timber of the Indian Reserves would be damaged and possibly also the livelihood of the Indians adversely affected. Damage would accrue to Indian lands on Lac la Croix even under the modified proposals of the Receivers in their statement on March 23, 1933.

Public Works The Department of Public Works, which has certain responsibilities in regard to navigation interests in Canada, represented that "the dams at the outlets of Rainy and Namakan Lakes were conceived and constructed by the Ontario and Minnesota Power Company for power development purposes, and have been operated by the company primarily in the interests of power and subject to the exigencies of power demand in relation to the run-off from year to year, and that any benefit accruing to navigation by the construction and operation of the dams has been of a very minor character and has been wholly incidental and subsidiary to the use of the dams by the Ontario and Minnesota Power Company for power purposes and that no portion of the cost of such dams or storage can be charged to navigation."

It was submitted on behalf of the Department of Public Works that the findings of the Commission should be conclusive and final, that no present action is warranted in the interests of navigation and that no future development can be planned for this interest at the present time. At the same time the department was of the opinion that such action would not preclude international action in the future, should conditions in respect to transportation alter.

Ontario On behalf of the province of Ontario, and its various interests in the subject-matter of the investigation, it was submitted that the province had no immediate interest in securing additional storage in Rainy lake and the upper boundary waters, and would not be prepared to consider any contribution towards the cost of such increased storage. In the opinion of the province it was not now economically practicable or desirable to secure the suggested storage. As to the situation in the future, it was held that that was a matter that could only evolve as the industrial development of the district progressed, and a demand for power was created.

In regard to fishing interests, the view of the province was that they would be materially affected, and possibly seriously injured by the projects tentatively suggested.

As to timber interests of the province, there would be no benefit from increased storage; on the contrary the flooding involved would necessarily destroy timber. "In any project which might be proceeded with, the Ontario Department of Lands and Forests would insist upon the salvaging of the timber and the clearing of the foreshores to such extent as it considered necessary to protect its timber interests." So far as existing levels are concerned, the view

was expressed that "the timber interests have secured no benefit from the present storage on Rainy Lake and on the waters controlled by the dams at Kettle Falls, but, on the contrary, valuable timber has been destroyed without compensation."

With regard to foreshore interests in Ontario, it was stated that "should any definite project be proceeded with adequate compensation for the flooding of such lands as may be involved will be required by the administrative department of the Ontario Government."

Domestic and sanitary interests, it was said, were largely a matter of protecting the town of Fort Frances. Otherwise it was not considered that there would be any serious objection from a public health standpoint arising from the development of projects such as those suggested by the questions of the Reference.

Ontario's Power Interest Dr. T. H. Hogg, Consulting Engineer to the Province of Ontario, summarized the present and future power demands of the district covered by the investigation, so far as Ontario was concerned, as follows:—

"(1) There is no industrial development at present in the Upper Boundary waters area.

"(2) The future market for power in the Upper Boundary waters is dependent on mining development.

"(3) Additional power at Fort Frances from Upper Boundary waters is not required at present.

"(4) Additional power from Winnipeg river power sites is not required at present at Kenora.

"(5) Present and future power need of Manitoba market, for some time to come, can be supplied by existing developments on the Winnipeg River.

"(6) The cost of storage charged against undeveloped sites in Ontario would, if proceeded with before the power is required, be borne by the Province, to accumulate against the time when each site would be developed.

"(7) The existing storage on Rainy and Namakan Lakes was created to meet the needs of the power plants at Fort Frances and Rainy River, and no benefit has been derived therefrom by the plants at the Lake of the Woods outlets or the power sites below that point.

"(8) It is possible that storage might be obtained more economically at other sites in the drainage basin.

"(9) The proposed scheme of development, suggested in the Engineers' Final Report, in the Upper Boundary waters, would have the effect, by diverting the waters from their natural course through Ontario to the boundary waters, of transferring upwards of 22,000 horse-power, now located within the boundaries of the province of Ontario, and owned outright by the province, to international channels, and I presume under the International Water Treaty thereby becoming half owned by each country."

Future Development In a supplementary statement, Mr. W. A. Boys, counsel for Ontario, emphasized the fact that his province did not wish to be understood in any sense as advocating that the door should be shut to future power developments in the region covered by the Investigation. "Ontario" he said, "does not believe that it is impossible to secure a reasonable use of the upper boundary waters for power and storage purposes, and at the same time to maintain their full recreational and tourist value... Ontario would therefore strongly urge upon the Commission that in its report upon this Reference it should not block all future reasonable use of these boundary waters for any purpose which may hereafter become desirable in the public interest."

Manitoba The province of Manitoba set forth its viewpoint with respect to the questions of the Reference in substantially the following terms: Inasmuch as no interest in Manitoba can make use of further storage for many years, it is not now from an economic standpoint practicable or desirable to provide additional storage. As to the future, Manitoba holds that it will not become practicable and desirable to provide such storage so long as the cost of such storage is so high as compared with the value of power developable therefrom. In regard to existing storage, the opinion of the province is that inasmuch as no Manitoba interest has received, nor can expect to receive, any benefit therefrom, they should not be assessed with any portion of the cost.

At the same time the following written statement was filed on behalf of all the Manitoba interests:

"These arguments are not in any way made in opposition to the scheme advocated by the Receiver, which would appear to be acceptable from both the economic and engineering aspects. And it would further appear that the system of regulation suggested by Mr. Meyer would so far as can be determined be the best system to serve power developments situated adjacent to the storage basin without detracting in any degree from the natural beauties now existing."

Canadian National Railways On behalf of the Canadian National Railways it was stated that they "not only will derive no benefit whatever from any increase in the levels of Rainy Lake or Namakan Lake or the boundary waters above Namakan Lake or any regulation of the levels of any of these waters or the provision of additional storage, but on the contrary the railways will inevitably be put to the labour and expense detailed in its claim."

Winnipeg Electric Company, etc. The position of the Winnipeg Electric Company, the Manitoba Power Company, and the Northwestern Power was that under present conditions and from an economic standpoint the development of additional storage on Rainy Lake and the upper waters was neither economical nor desirable so far as these interests were concerned. The cost of such storage was liable to be much in excess of what additional storage could now be secured for on parts of the Winnipeg River and English River watersheds. It was not possible at the present time for the companies to consider any additional expense to provide storage facilities on the lakes in question. The companies maintained that they had not received any benefits from present storage.

Winnipeg The viewpoint of the city of Winnipeg was substantially the same as that of Manitoba power companies outlined above.

Fort Frances The representative of the town of Fort Frances pointed out that the uncompromising opposition expressed at the 1925 hearing by the town to the proposals of Mr. Backus, no longer applied to the modified proposals of the Receivers. "It is believed that the advantages to be derived from the development of power on Loon River would be in no way injurious to the interests of the town of Fort Frances, but may on the contrary, if Canadian interests are properly safeguarded, result in material benefit."

Mr. Read In summing up the interests of Canada, the provinces of Ontario and Manitoba, and others on the Canadian side concerned in the investigation, and their views as to how the questions of the Reference should be answered in order to safeguard all material interests, Mr. J. E. Read, counsel for the Dominion Government, said:

"It is evident that Canadian navigation and power interests are not at the present time interested in securing additional storage facilities in Rainy or Namakan Lakes or in the upper boundary waters, while the concern of the

Dominion Department of Indian Affairs, the Canadian National Railways, and the timber, fishing and foreshore interests generally, lies almost entirely in the extent to which they would be respectively damaged by the raising of the water levels. With regard to the question as to under what conditions it would become practicable and desirable to provide additional storage facilities in Rainy and Namakan Lakes and in the upper boundary waters, the general viewpoint is expressed that that is a matter which can only be determined in the future, as or when the local development of power or navigation may warrant. . . . It is the unanimous opinion of the interests reviewed that they have not been benefited by the operation of the dams at the outlets of Rainy and Namakan Lakes and that consequently no portion of the costs of such dams or storage should be charged to the said interests."

Mr. Read went on to say:—

"In view of the unanimity of the views expressed by the various Dominion and provincial interests concerned, the Government of Canada is of the opinion that the Commission can only report to the two Governments that there is no present demand in Canada for increased storage in the Rainy and Namakan Lakes or in the upper boundary waters. The Commission might further report that any future demand for additional storage will be dependent altogether upon conditions as they develop in the future and which cannot at present be forecast, and furthermore that if or when a demand should arise for the development of additional storage facilities in these waters, the responsibility for initiating further consideration of the problem should be left solely with the interests who at that time are desirous of securing such additional storage, such interests to assume the full cost of providing such storage as may be required.

"If or when any interest or interests become actively concerned in the need for additional storage or power, the matter should be brought forward in the form of a specific project sponsored by the interest or interests concerned in its realization, who should secure the consent of the appropriate administrative jurisdiction on either side of the boundary and thereafter submit the said project to the International Joint Commission for approval in accordance with the usual procedure under Article III of the Boundary Waters Treaty of 1909."

**Ontario's
Jurisdiction**

Mr. Boys, counsel for Ontario, in his statement at Winnipeg had argued that the Commission had no jurisdiction to entertain, in the first instance, the proposals of the Receivers, in so far as they affected the province of Ontario. Application in regard to any rights in that connection should first be made to the province of Ontario, so far as Canadian territory was concerned, and thereafter obtain federal approval, and the approval of the International Joint Commission.

In view of the importance of the point raised by Mr. Boys, and the fact that there appeared to be a certain misapprehension as to the scope of the present Reference and the jurisdiction of the Commission under the Treaty, Sir William Hearst made the following statement on behalf of the Commission:—

"The Treaty of 1909 between Great Britain and the United States is undoubtedly within the treaty-making powers of the two countries and its validity has never been questioned. It is under the provisions of this Treaty that this Commission was appointed, and it is from this Treaty the Commission derives its authority and powers. Article IX of the Treaty reads as follows:

The High Contracting Parties further agree that any other questions or matters of difference arising between them involving the rights, obligations, or interests of either in relation to the other or to the inhabitants of the other, along the common frontier between the United States and the Dominion of Canada, shall be referred from time to time to the International Joint Commission for examination and report, whenever either the Government of the United States or the Government of the Dominion of Canada shall request that such questions or matters of difference be so referred.

The International Joint Commission is authorized in each case so referred to examine into and report upon the facts and circumstances of the particular questions and matters referred, together with such conclusions and recommendations as may be appropriate, subject, however, to any restrictions or exceptions which may be imposed with respect thereto by the terms of the reference.

Such reports of the Commission shall not be regarded as decisions of the questions or matters so submitted either on the facts or the law, and shall in no way have the character of an arbitral award.

The Commission shall make a joint report to both Governments in all cases in which all or a majority of the Commissioners agree, and in case of disagreement the minority may make a joint report to both Governments, or separate reports to their respective Governments.

In case the Commission is evenly divided upon any question or matter referred to it for report, separate reports shall be made by the Commissioners on each side to their own Government.

"It was under this Article that the questions which were read by Mr. Burpee this morning were referred to the Commission. I desire to call particular attention to that part of Article IX which says:

Such reports of the Commission shall not be regarded as decisions of the questions or matters so submitted either on the facts or the law, and shall in no way have the character of an arbitral award.

"The Governments of the two countries, evidently desirous of being informed with respect to the economic practicability and desirability of regulating the levels of Rainy Lake and Namakan Lake and providing storage facilities on the lakes above Namakan, and with respect to the interests benefited by the present storage on Rainy Lake and on the waters controlled by the dams at Kettle Falls, the nature and extent of such benefits in each case, the cost of such storage and how such storage should be apportioned among the interests benefited, submitted to us certain questions which we are called upon to answer. What action, if any, the Governments may take when they have received our report is something with which the Commission has nothing to do.

"When the Reference was received by the Commission we followed the usual procedure in such cases and fixed a time and place for a public hearing and gave notice to all parties interested in the same. The first hearing was held at International Falls in September, 1925. The companies owning the power works at International Falls and Fort Frances and the dams at Kettle Falls, commonly known as the Backus Companies, seemed to have the greatest direct interest in the waters mentioned in the Reference, and Mr. Backus was called upon to make a concrete statement of what he proposed and in more or less detail to set forth what he suggested could be done.

"There was no thought on the part of the Commission to treat Mr. Backus' proposition as an application to which the Commission should give its approval; it was merely an outline of what Mr. Backus had in mind that might or might not be helpful to the Commission and the engineers of the Commission in arriving at the proper answers to the questions submitted.

"Many other parties presented views to the Commission at the International Falls hearing. Since that time eminent engineers of the United States and Canada have made extensive surveys and studies of the situation, accumulated a large amount of data, and have given to the Commission an extensive report to help and guide us in reaching the proper answers.

"To-day we have met for a final hearing, after due notice to all parties concerned, and we are desirous of hearing the views of every person who desires to be heard, whether these views are in the shape of concrete suggestions as to the most economic method of developing the waters in question as put forth by counsel for the Receivers of the Minnesota and Ontario Paper Company, or in the way of specific suggestions as to the answers to questions in the shape set forth by counsel for the Quetico-Superior Council.

"Mr. Boys is quite right that this Commission has no power under this Reference to grant any application of the Receivers of the Minnesota and Ontario Paper Company or any person else. When any person presents an application for authority to construct a dam or works in international waters he must first obtain the proper governmental authority, and, after that, he will have to come to this Commission for approval. I think perhaps what disturbed Mr. Boys most was the proposition put forth in Washington by one of the counsel for the Receivers that when boundary waters left the boundary and flowed entirely through one country for a distance and then again returned to boundary waters, they remained boundary waters even when flowing entirely within one country.

"Mr. Boys is quite right that we have no power under this Reference to consider other than boundary waters. This is made clear by Question 1 of the Reference which reads: 'In order to secure the most advantageous use of the waters of Rainy Lake and of the boundary waters flowing into and from Rainy lake, for domestic and sanitary purposes,' etc.

"Boundary waters are defined by the Treaty as follows:

For the purposes of this Treaty boundary waters are defined as the waters from main shore to main shore of the lakes and rivers and connecting waterways, or the portions thereof, along which the international boundary between the United States and the Dominion of Canada passes, including all bays, arms, and inlets thereof, but not including tributary waters which in their natural channels would flow into such lakes, rivers, and waterways, or waters flowing from such lakes, rivers, and waterways, or the waters of rivers flowing across the boundary.

"Now, if Mr. Rogers wants to argue that a river flowing for a distance entirely in Canada or entirely in the United States is a boundary water, within the meaning of the Treaty and within the meaning of Question 1, we will listen to what he has to say. I am not sure, however, that it will be at all necessary to decide that question in order to answer the questions submitted.

"May I simply add that we will consider all relevant statements and material that have been submitted or that may be submitted to us at this hearing or at the hearing in Minneapolis next week; and having regard to all the information received and to the best study we can give to the subject, we will answer the questions to the best of our ability."

Mr. Read dealt with the same point in the course of his argument.

"Returning now," he says, "to the question of the development of the power and storage resources of the upper boundary waters, whether by means of the modified proposals of the Receivers, or by some other method advocated by other interests, it is submitted that this Commission has no authority to grant any power or storage or diversion rights to the Receivers or to any other applicant. All that the Commission can do under the Boundary Waters Treaty (Article IX) is to examine into and report upon the facts and circumstances of the particular questions and matters referred, together with such conclusions and recommendations as may be appropriate, subject, however, to any restrictions or exceptions which may be imposed with respect thereto by the terms of the Reference. The ownership of the resources of water, power, timber, fishing and foreshore generally, on either side of the boundary, is vested in either Dominion, provincial, federal or state authorities and is not within the disposition of the Commission under the Treaty.

"It is submitted, therefore, that the procedure to be followed in the future with respect to proposed or suggested developments in these waters, whether these proposals are brought forward by the Receivers or submitted by others, should be for the applicant to make formal application to the appropriate Canadian authority for the rights and privileges desired. Should such application be considered favourably there would, in the normal course, issue a licence providing for the development of the privileges granted and incorporating

therein such provisos and conditions as would adequately protect all the interests concerned including fishing, timber and foreshore interests generally. Approval of the undertaking should also be secured from the Dominion Department of Public Works, under the provisions of the Navigable Waters Protection Act. If boundary waters are involved, a similar procedure should be followed in the United States. With such basic rights and approval secured from the appropriate authorities, the applicant can then come to the Commission under the provisions of the Boundary Waters Treaty for the formal approval of the Commission to its undertaking."

Future Development Mr. Read announced the concurrence of the Canadian Government in the position taken by Mr. Boys on behalf of the Government of Ontario, as to the position taken by the Quetico-Superior Council that all power development in the upper boundary waters should be prevented upon the ground that it might or would interfere with the recreational values of the area. Mr. Read said, "In Ontario and also in the other provinces of the Dominion it has been found possible to reconcile the hydraulic development of an area with the complete preservation of the recreational values of the district. Further, as I understand, the proposals that have been put forward have contemplated the subsequent negotiation of a treaty between the United States and Canada to ensure the maintenance of the recreational values of the district. Consequently, I should urge that in any recommendation the Commission sees fit to make with regard to this matter it should not restrict the two Governments in the difficult task of negotiating a treaty to deal with this matter."

Minnesota In summing up the arguments on behalf of the State of Minnesota, it was submitted that present levels on the lakes along the boundary should not be increased because:

- "1. (a) It would injuriously affect some species of fur-bearing animals because wide fluctuations of lake levels in winter would prevent them—particularly muskrats—from maintaining a passageway from their houses to the water in which they feed.
 - "(b) That on the whole, at least for a number of years, any raising of border lake levels would be unfavourable to the propagation of fish by compelling them to seek new and less favourable spawning grounds and would also cause entrapment of fish in inland lagoons when lake levels were drawn down.
 - "(c) That some of the nesting grounds of certain aquatic fowl will be destroyed and that many years will elapse before new ground of equal value will become available through natural processes.
- "2. Would be distinctly unfavourable to navigation of the lakes affected because many of the innumerable islands which now provide sheltered channels for small craft would be submerged and not only would shelter be destroyed but many new and uncharted reefs would be created. Present landing places would be submerged and, unless all stumps on flooded margins were removed, access to the new shorelines would be dangerous. Finally, widely fluctuating water levels would make construction of suitable docks expensive and, in many cases, impossible.
- "3. Would be disastrous to the scenic beauty and recreational advantages of the border lakes,—
- "(a) By destroying many beautiful islands and the existing landing-places and bathing-beaches.
 - "(b) By eliminating waterfalls in the rivers which link the border lakes, and by creating new shore-lines which cannot have the beauty of those which have been weathered for centuries.
 - "(c) Failure to remove timber and stumps would make shore-lines hideous and dangerous.

" 4. Would entail very serious losses upon the tourist business of the state which is very extensive in this region and which would be injured by anything that would seriously mar the beauty of the region.

" 5. Would not produce any commensurate advantage because the additional 5,000 horse-power for use by a private corporation in Minnesota would be a bagatelle as compared to the losses set forth above."

As to the practicability or desirability of raising the levels at some future time, it is said that "the state is decidedly of the opinion that at no future time will it become practicable and desirable to regulate the levels of any of these border lakes in such a manner as to permit the present levels to be exceeded. It would be decidedly to the advantage of the people on both sides of the border if this matter could be settled and settled for all time. Orderly development of this vast region can proceed with confidence only in case the men who wish to construct buildings, whether for private summer homes or tourist resorts or for any other purpose can have definite assurance that their investment will not be destroyed by the authorization of higher water levels."

In conclusion the state of Minnesota recommended that the Commission should report to the Governments of the United States and Canada findings to the effect:

"That the level of Rainy Lake and the level of the waters controlled by the dams at Kettle Falls shall not now or at any future time be regulated so as to permit the upper limit of the ordinary range of levels to exceed 1108.61 sea level datum for the former and 1120.11 for the latter.

"That no storage be permitted upon any of the boundary waters above Namakan Lake.

"That unified control be established for the regulation of the water levels of all of the border waters subject to regulation in the drainage area of the Lake of the Woods.

"The state further recommends that this Commission set up machinery for determining the damages resulting to each parcel of land injuriously affected by the dams at International Falls and Kettle Falls and require the amount of such damages to be paid by the present owners of such dams as a condition to the continued operation of such dams."

Unified Control It may be convenient to note at this point that in his final submission at the Minneapolis hearing, Mr. J. E. Read, on behalf of the Government of Canada and other Canadian interests, made the following comment on the recommendation of the State of Minnesota in the matter of unified control:

"In the Minnesota brief the position is taken that the Commission should recommend to the two Governments the establishment of international control and regulation, not only of prospective storage but also of existing storage in this area. This would involve international control and regulation of the dams at the outlets of Rainy and Namakan Lakes.

"The Canadian Government has not made any request for the establishment of international control on Rainy Lake and other boundary waters. One cannot fail to recognize, however, the force of the reasons influencing the state of Minnesota in advancing such a request. It has been contended that the artificial regulation of the upper waters at times may have adversely affected, and may in the future adversely affect, conditions in other parts of the watershed.

"Reference has been made to embarrassing emergencies which have arisen in the past owing to the lack of adequate machinery for joint international control. Accordingly, the Canadian Government, while not requesting the provision of international control of Rainy and Namakan Lakes, and although

not fully concurring in the position taken on behalf of the State of Minnesota in this respect, admits that under some circumstances a measure of control may be desirable.

"Grounds of administrative expediency and economy would suggest that the international control could conveniently and safely be confined to meeting purely emergency conditions. The supervision and control might be confined to times in which emergency conditions prevail, while at others periods the regulation and control might continue to be exercised by the parties now responsible for such regulation and control.

"Accordingly it is submitted that the Commission may recommend that it be clothed by the two Governments with authority to determine at all times in the future when emergency conditions, whether of high flow or of low flow, obtain throughout the watershed. The Commission should be endowed with the necessary authority to adopt and carry out such measures of control as shall be appropriate in the circumstances, in the event that the Commission at any time determines that emergency conditions exist."

Damage Claims Commenting on the last recommendation of the State of Minnesota to the effect that the Commission should set up machinery for determining and paying damage claims arising out of the operation of the existing dams at International Falls and Kettle Falls, Mr. Read said: "I am not prepared to argue that the Commission has the jurisdiction or authority under the Reference to inquire into damage claims against the company; but, in the event that the Commission so decides, an opportunity should be reserved to enable Canadian claimants to submit claims of this character."

International Falls On behalf of the city of International Falls, Minnesota, it was submitted that "it would be of the utmost benefit to the entire territory that the suggestion (of the Receivers) be given favourable consideration."

Summary In the foregoing pages the substance has been given of testimony and arguments presented at Winnipeg and Minneapolis on behalf of the State of Minnesota, the Dominion of Canada, the Provinces of Ontario and Manitoba, the Canadian National Railways, the cities or towns of Winnipeg, Fort Frances and International Falls, the Receivers of the Minnesota and Ontario Paper Company, Mr. E. W. Backus, the Winnipeg Electric Company and other water-power interests in Manitoba, the Quetico-Superior Council and other organization and individuals associated with it. In the record of these hearings will be found the testimony and views of a number of other organizations and individuals, on either side of the international boundary, some of whom advocated and others opposed changes in water levels on boundary lakes in the area covered by the Reference. It is believed, however, that their evidence is substantially covered by the foregoing statements.

CONCLUSIONS AND RECOMMENDATIONS

The boundary waters referred to in the Reference and the territory tributary thereto are of matchless scenic beauty and of inestimable value from the recreational and tourist viewpoints. The Commission fully sympathizes with the objects and desires of the State of Minnesota and the Quetico-Superior Council and others who take the position that nothing should be done that might mar the beauty or disturb the wild life of this last great wilderness of the United States. The Commission feels that it is impossible to over-state the recreational and tourist value of this matchless playground. Its natural forests, lakes, rivers and waterfalls have a beauty and appeal beyond description, and nothing should be done to destroy their charm.

The Commission also sympathizes with the aims and the objects of those who advocate that this beautiful natural sanctuary, emblematic of peace and unmarred by the hand of man, should be set apart as a memorial park to commemorate the more than a century of peace, good will and common ideals that have existed between the English-speaking peoples that live side by side on the northern half of this continent; and the Commission is particularly desirous that nothing contained in this report should present any obstacle to or in any way interfere with the Governments of the two countries entering into a treaty for this purpose.

There are, however, other interests and aspects that cannot be overlooked. The citizens of the two countries have invested large sums of money at International Falls and Fort Frances in the construction of works for the production of pulp, paper and other commodities. Towns have been built at these points and large sums of money expended for public utilities and other purposes. Workmen have built their homes and their future livelihood and happiness depend upon the continued existence of these works. It, therefore, becomes of the utmost importance that nothing should be done that would militate against their continued operation on a firm and sound economic basis.

In the opinion of the Commission it is not impossible to reconcile the recreational value of the territory under review with a certain amount of power development. In the New England States and in the Province of Ontario, lakes and rivers, centres of great tourist activity, have been controlled without serious detriment to recreational interests; and the Commission feels that a reasonable use of these waters, properly controlled and regulated, might be permitted without serious injury to the beauty of the district.

While, therefore, the Commission is of the opinion that at the present time the construction of power works is not necessary or desirable, it wants to leave the way open for the approval of a reasonable development of storage facilities upon the waters above Namakan Lake if and when economic and other conditions appear to warrant; such improvements to in no way interfere with the vast area tributary to the headwaters of the water system in question, and to be constructed under such conditions and supervision as to adequately safeguard recreational interests.

The modified scheme of development proposed by the Receivers of the Minnesota and Ontario Paper Company was described by Mr. A. F. Meyer, their engineer, at the Minneapolis hearing on October 12, 1933, as follows:

"The most advantageous use of these waters may be secured by regulating the level of the upper boundary lakes between natural extreme low water and natural extreme high-water mark in the following manner:

"Permit the lakes to fill up in the spring so as to reach approximately their ordinary high-water level by about June 1, and then maintain that level as closely as practicable until fall. Beginning about October 1, draw the lakes down gradually so as to reach approximately their low-water levels by about April 1, in time to store the spring inflow.

"Utilize the natural storage and flow-equalizing capacity of the lake, between the ordinary high-water level and the extreme high-water level, only to the same extent as nature would have utilized it.

"In general, the regulated normal level should be approximately half way between natural extreme low water and natural extreme high water. There will be no timber below this level and no land will be flooded that was not flooded under natural conditions.

"On Lac la Croix, the regulated level may advantageously be established at approximately elevation 1186.0 sea-level datum."

This modified scheme would not appear to the Commission to be subject to serious objections from a recreational standpoint.

At the first hearing on this Reference in International Falls, Mr. E. W. Backus, who then represented the Minnesota and Ontario Paper Company and its subsidiaries and allied companies, appeared before the Commission and outlined an ambitious scheme of power development designed to secure the greatest amount of power possible from the waters referred to in the Reference. Subsequent to this hearing, namely, on or about the 28th February, 1931, the Minnesota and Ontario Paper Company encountered financial difficulties and Receivers were appointed, who since that time have been in control of the power works and mills owned by the company at International Falls and Fort Frances. Mr. Meyer, the engineer for the Backus interests, continued as engineer for the Receivers, and on behalf of the Receivers outlined at the hearings held at Winnipeg and Minneapolis a much more moderate scheme of development than that originally proposed.

Mr. Backus appeared personally at the hearing in Minneapolis, and has since filed a letter dated March 28, 1934, in which among other things, he makes certain representations in which he takes issue to some extent with the Receivers and Mr. Meyer, as well as with those who urged that no works of any kind for power development should be permitted in these waters.

While the Receivers advocate certain projects as necessary for the protection of the receivership estate, no evidence was adduced before the Commission that either the Receivers or any person else was in a position to proceed or intended to proceed with the proposed projects or any other projects for the development of the waters in question.

It is suggested by some that the modified development suggested by the Receivers, and particularly described elsewhere in this Report, is unwise and might if carried out prevent the utilization of the waters affected to the greatest advantage hereafter for power purposes. Whether or not it will ever be practicable or desirable to create storage facilities on these waters depends entirely upon future economic conditions at International Falls and Fort Frances and at other points in that territory; and the extent and character of the improvements that should be made for power purposes depend entirely on the demand, if any, that may hereafter arise in that territory for power and the value of such power for commercial uses.

If and when any interest, private or public, should desire to secure further power from the waters in question, it will be necessary for them to secure the approval of the proper authorities on both sides of the boundary, and the matter will then have to come before this Commission under the provisions of Article III of the Treaty of January 11, 1909, and this Commission is of the opinion that when it has a concrete application before it, it will be in a much better position to determine whether or not such works are practicable and desirable, the levels at which they should control the waters, the conditions under which they should be operated, and the supervision that should be exercised in connection therewith.

It is quite impossible to foresee what developments may take place in the future in this area or what may be the urgency of the demand for power in connection with such developments. It is therefore impracticable at the present time for the Commission to outline with any accuracy or precision the conditions under which it may become practicable or desirable to regulate the level of the waters above Lake Namakan. Indeed, any attempt to do so at the present time might prove productive of mischief rather than benefit. The problem of such development must therefore necessarily be left for consideration by the proper authorities on both sides of the boundary if and when such conditions arise. The Commission is of the opinion that the responsibility for initiating such possible future development might well be left with the interests directly concerned.

ANSWERS TO QUESTIONS

Question 1.—In order to secure the most advantageous use of the waters of Rainy Lake and of the boundary waters flowing into and from Rainy Lake, for domestic and sanitary purposes, for navigation purposes, for fishing purposes, and for power, irrigation and reclamation purposes; and in order to secure the most advantageous use of the shores and harbours of both Rainy Lake and the boundary waters flowing into and from the lake, is it, from an economic standpoint, now practicable and desirable, having regard for all or any of the interests affected thereby, or under what conditions will it become thus practicable and desirable—

- (a) 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 elevation 1108·61 sea-level datum?
- (b) To regulate the level of Namakan Lake and the waters controlled by the dams at Kettle Falls in such a manner as to permit the upper limit of the ordinary range of the levels to exceed elevation 1120·11 sea-level datum?
- (c) To provide storage facilities upon all or any of the boundary waters above Namakan Lake?

Answer

(1) The Commission is of the opinion that it is not at the present time practicable and desirable—

- (a) to regulate the levels 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;
- (b) to regulate the level of Namakan Lake and the waters controlled by the dams at Kettle Falls in such a manner as to permit the upper limit of the ordinary range of the levels to exceed elevation 1120·11 sea-level datum.

(2) The Commission is further of the opinion that it is unlikely that at any time in the future it will become practicable and desirable to regulate the levels of Rainy or Namakan Lakes as suggested in parts (a) and (b) of Question 1.

(3) The Commission is of the opinion that conditions at some time in the future may be such as to warrant a limited development of storage facilities under proper regulations upon some of the boundary waters above Namakan Lake as suggested in part (c) of Question 1 above.

The Commission, however, respectfully submits that it is not practicable or desirable at the present time to attempt to determine the conditions under which such development may become practicable and desirable, and that such determination should be left until a concrete application is made to this Commission under Article III of the Treaty for the approval of plans of works designed to regulate the levels and provide the storage facilities referred to in above Question, after the applicant has secured all requisite and proper authority and/or licences on both sides of the boundary for the construction of such works.

Question 2.—If it be found practicable and desirable thus (1) to regulate the level of Rainy Lake, and/or (2) to regulate the level of Namakan Lake and the waters controlled by the dams at Kettle Falls, and/or (3) to provide storage facilities upon all or any of the boundary waters above Namakan Lake—

- (a) What elevations are recommended?

- (b) To what extent will it be necessary to acquire lands and to construct works in order to provide for such elevations and/or storage, and what will be their respective costs?
- (c) What interests on each side of the boundary would be benefited? What would be the nature and extent of such benefit in each case? How should the cost be apportioned among the various interests so benefited?

Answer

In view of the Answer to Question 1, it becomes unnecessary to answer this question at the present time, and the Commission respectfully submits that the method of control of future works be left open for consideration and determination when a concrete application has been made for leave to construct works as suggested in the Answer to Question 1.

The Commission, however, submits that it would be wise and in the public interest that the Commission be clothed with power to determine when unusual or extraordinary conditions exist throughout the watershed, whether by reason of high or low water, and that it be empowered to adopt such measures of control as to it may seem proper with respect to existing dams at Kettle Falls and International Falls, as well as any future dams or works, in the event of the Commission determining that such unusual or extraordinary conditions exist.

Question 3.—What methods of control and operation would be feasible and advisable in order to regulate the volume, use and outflow of the waters in each case in accordance with such recommendations as may be made in answer to Questions 1 and 2?

Answer

In view of the Answer to Question 1, the Commission submits that it would be unwise and inadvisable to attempt to answer this Question at the present time.

Question 4.—What interests on each side of the boundary are benefited by the present storage on Rainy Lake and on the waters controlled by the dams at Kettle Falls? What are the nature and extent of such benefits in each case? What is the cost of such storage and how should such cost be apportioned among the various interests so benefited?

Answer

No interests on either side of the boundary are benefited by the present storage on Rainy Lake or on the waters controlled by the dams at Kettle Falls, other than and except the interests by which the dams and works providing for such storage and control were constructed and are owned and operated. As in the opinion of the Commission no interests are benefited by reason of the storage, other than the interests that incurred the cost of creating such works, and as consequently no apportionment of such cost among the various interests is required, it becomes unnecessary to attempt to determine the cost of such storage.

Dated at Washington this first day of May, 1934.

A. O. STANLEY
 C. A. MAGRATH
 JOHN H. BARTLETT
 W. H. HEARST
 EUGENE LORTON
 GEO. W. KYTE

APPENDIX

EARLY HISTORY OF REGION

Three routes were more or less in use by explorers and fur-traders between Lake Superior and Rainy Lake, during the period of French rule in Canada. These were known as the Kaministikwia route, the Grand Portage route, and the St. Louis River route. The first left Lake Superior at the place where the city of Fort William stands to-day, and ascended the Kaministikwia River to Lac des Milles Lacs and then down Seine River to Rainy Lake. The second crossed the Grand Portage from Lake Superior to the Pigeon River above the falls, and then followed what is now the international boundary to Rainy Lake. The third left Lake Superior at the point where the city of Duluth stands to-day and by way of St. Louis River and connecting waters led to Rainy Lake and Rainy River.

The first of these routes to be discovered was that of the Kaministikwia. In the year 1687 or 1688 Jacques de Noyon, a native of the town of Three Rivers, on the St. Lawrence, made his way up the Kaministikwia River and following a chain of lakes and streams, with many portages, up to the height of land and down by other waterways to what was then called the lake of the Crists or Cristinaux, which we know to-day as Rainy Lake, built a small trading post at the western end of this lake, or on the banks of the Tekaminouen River, also known as the Ouchiehiq River which to-day is called Rainy River, where he spent the winter. This trading post was probably on the site of the present town of Fort Frances, where a succession of trading posts were afterwards established.

In 1717 Lieutenant Zacharie Robutel de la Noüe, a native of Montreal, and who had taken part in the expedition of the French against the posts of the Hudson's Bay Company on James Bay in 1686, was sent to build a trading post at the mouth of the Kaministikwia. After completing the fort, he made an expedition up the river and followed the same portage route as de Noyon to Rainy Lake, where he built Fort Tekaminouen.

Fourteen years later the great explorer Pierre Gaultier de La Vérendrye arrived at the western end of Lake Superior with three of his sons, his nephew La Jemeraye, and a party of soldiers and voyageurs, with which he had set out to discover a way to the western sea, otherwise the Pacific ocean.

La Vérendrye had trouble with his men who showed an inclination to mutiny. He therefore took most of them with him to Fort Kaministikwia, while La Jemeraye with a small party of picked men, followed the Grand Portage route to Rainy Lake. This journey of 1731 was therefore the first occasion on which white men travelled over the Grand Portage route between Lake Superior and Rainy Lake.

La Jemeraye built a trading post at the outlet of Rainy Lake, which he named Fort St. Pierre in honour of the leader of the expedition. The fort stood on what is now known as Pither's Point, in the town of Fort Frances, and the site of the fort was said a few years ago to be still recognizable. In June, 1732, La Vérendrye set out from Fort Kaministikwia, and a month later the whole expedition was reunited at Fort St. Pierre. In one of his Journals La Vérendrye gives this description of Fort St. Pierre:

"A fort with two gates on opposite sides. The interior length of the sides is 50 feet with two bastions. There are two main buildings, each composed of two rooms with double chimneys. Around these buildings is a road 7 feet wide; and in one of the bastions a storehouse and a powder magazine have been made, and there is a double row of stakes 13 feet out of the ground."

In the years that followed, La Vérendrye and his sons repeatedly visited Fort St. Pierre on their way to and from their posts in the west, on Lake of the Woods, Lake Winnipeg, the Red River and the Assiniboine. Towards the close of the period of French rule in Canada, Captain Jacques Repentigny Legardeur de Saint-Pierre, who had been sent out by the French Government to carry on the western explorations of La Vérendrye, visited Fort St. Pierre on his way to the western plains. This was in 1750. Three years later La Corne de St. Luc, who had been sent to replace Saint-Pierre, also visited the fort on Rainy Lake. This completes what is known of the history of Rainy Lake and the Grand Portage route, up to the close of the period of French rule in Canada. It is worth noting that, although Canada was so young at this period, all the explorers named in connection with Rainy Lake were natives not of old France but of Canada.

Canada, in the language of a recent writer, had scarcely been handed over to England before British traders began to make their way into the west by way of the Great Lakes to reap the harvest of peltries for which French explorers and traders had sown the seed. Who the first British traders were that reached Lake Winnipeg by way of Rainy Lake and the Lake of the Woods there is now no certain means of knowing.

In a letter from Benjamin and Joseph Frobisher to General Haldimand it is said that the first adventurer went west from Michilimackinac in 1765; that the Indians of Lac la Pluie or Rainy Lake, having long been destitute of goods, owing to the disorganization of French trade in the west after the surrender of Canada, stopped this adventurer and plundered his canoes, and would not suffer him to proceed farther; that he attempted again the year following and met with the same bad fortune; that another attempt was made in 1767, goods being left at Rainy Lake to be traded with the natives, who permitted the adventurer to proceed with the remainder; and that the canoes on this occasion traversed the Lake of the Woods and penetrated beyond Lake Winnipeg—how far or in what direction, or who the traders were, the Frobishers do not say.

It appears from the narrative of Jonathan Carver, that he met these or other traders at Grand Portage in the summer of 1767, and that they had already proceeded as far as Fort La Reine, on the Assiniboine, where they had opened up a trade with the Assiniboine and Cree. From other sources it appears that a trader from Montreal named James Finlay reached the Saskatchewan in 1767, and that one Thomas Curry followed him in 1770. Both these fur traders must, of course, have followed the route through Rainy Lake and the Lake of the Woods, but it is evident that they did not establish any trading post on these waters, and there is nothing to show that they made any use of Fort St. Pierre or Fort St. Charles, which very probably may have fallen into decay or been destroyed by the Indians in the interval.

In June, 1775, Alexander Henry reached Grand Portage on a trading expedition to the west. He proceeded by way of the Grand Portage route to Rainy Lake and the Lake of the Woods, and from thence descended the Winnipeg River to Lake Winnipeg and the Saskatchewan. In his narrative he says:

“We now entered Lake a la Pluie, which is 15 leagues long by 5 broad. Its banks are covered with maple and birch. Our encampment was at the mouth of the lake, where there is a fall of water of 40 feet, called the Chute de la Chaudière. The carrying place is 200 yards in length. On the next evening we encamped at Les Fourches (now the Big Forks) on the river a la Pluie, where there was a village of Chippewas of 50 lodges, of whom I bought new canoes. They insisted, further, upon having goods given to them on credit, as well as receiving some presents. The latter they regarded as an established tribute, paid to them on account of the ability which they possessed to put a stop to all trade with the interior. I gave them rum, with which they became drunk and troublesome, and in the night I left.”

The first trading establishment of the North West Company in the Lake of the Woods district was that known as Rainy Lake House, or Fort of Lake La Pluie. It is uncertain when this post was built, but in the Journal of John McDonnell of 1793 it is referred to as follows:

“In sight of the fort of Lake La Pluie is the Kettle Fall, causing a portage. The fort stands on the top of a steep bank of the river. It has two wooden bastions in front flanking the gate.”

David Thompson, who visited the post in 1797, says it stood half a mile below the falls. On the other hand, Alexander Mackenzie, in his *General History of the Fur Trade* (1801) described it as standing two miles below the falls, “situated on a high bank on the north side of the river, in 48°37' north latitude. Here” he adds, “the people from Montreal come to meet those who arrive from the Athabasca country and exchange lading with them.”

In 1799 Peter Grant was in charge of the post, and was succeeded by Dr. John McLoughlin, in later years, after the amalgamation of the North West and Hudson's Bay Companies, one of the leaders of the fur trade on the Pacific coast. In any event, Rainy Lake House must have been built some time before 1793 and after 1775, as it is not mentioned in Alexander Henry's *Travels and Adventures*.

The Hudson's Bay Company also built a post on Rainy River about where the town of Fort Frances stands to-day. It was rebuilt many years afterwards and named Fort Frances, after the wife of Sir George Simpson, governor of the company. In fact, the Hudson's Bay Company must have had more than one trading post on Rainy River before 1800, for in his journal of that year Alexander Henry writes:

“We camped below Manitou Rapids. . . . At daybreak we embarked and passed the old H.B. Co. establishment, which has been abandoned for several years. Soon after we came down the Long Sault. At 12 o'clock passed Rapid River, at 2 o'clock passed another old H.B. Co. establishment, and soon after came to the entrance of Lake of the Woods.”

Jesuit missionaries accompanied La Vérendrye into the Lake of the Woods country and did what they could to Christianize the natives. Many years later Protestant missionaries attempted the same field, as appears from the following entry in the minutes of the council of the Hudson's Bay Company, held at Norway House in 1842:

“That a commissioned gentleman's allowance be forwarded from York Factory to each of the following Wesleyan missionaries: . . . Mr. Mason, Lac La Pluie.”

The first attempt by an American company to enter the fur trade of the then northwestern frontier was made by the old South West Company, to which, in the name of Toussaint Pothier, in the winter of 1811 or spring of 1812, a patent was issued for property for a trading post at the strait of Mackinac. The patent itself was captured by a British party during the war of 1812, and nothing further was apparently done to enter the fur trade in this region until after the war.

Michilimackinac, or Mackinac, as it was afterwards called, was a point of strategic importance from a commercial point of view, and through this post passed the trade from the district of Fond du Lac, so called from a post of that name at the place where the city of Duluth stands to-day. The district of Fond du Lac first consisted of the upper Mississippi posts at Leech Lake, Pokegame Lake, and Sandy Lake, together with the Red Lake post. Later the confines of the district were extended northward to the boundary, to take in the entire United States portion of the Lake of the Woods watershed.

The property and stock of the old South West Company was held principally by John Jacob Astor, of New York, and McTavish and Company, of Montreal. In 1815-16 Congress, in hope of excluding foreign competition in the frontier region, enacted a law prohibiting any one not a citizen from engaging in the Indian trade. Soon after Astor bought out the McTavish interest and formed the American Fur Company. The property was taken over in April, 1817, at Montreal, by Ramsay Crooks in behalf of Astor. Shortly after this the American Fur Company purchased from the North West Company the posts at the headwaters of the Mississippi, which this company had maintained here for a number of years. This purchase was the first step made by an American company in entering the fur trade on waters flowing into the Lake of the Woods. On June 20, 1817, Crooks writes to William Morrison, from St. Marys Falls on Lake Superior:

"I came to this place yesterday in the hope of possible meeting with and handing you in person the inclosed letter from Mr. Rocheblave, by which you will perceive the Northwest Company have sold to Mr. John Jacob Astor, of New York, all the interest they hold in the department of Fond du Lac now in your charge." . . .

With the property of the North West Company, the American Fur Company became heir to the former company's ruthless competition with the Hudson's Bay Company. The law previously passed by Congress was designed to prohibit the engagement in American trade of agents of either of the Canadian companies. It was provided that each trader must be a citizen of the United States and must procure a bonded licence from the agent of Indian affairs.

Referring to the early difficulties with the Hudson's Bay Company, then controlled by Lord Selkirk, Crooks writes from Mackinac to Astor on June 23, 1817:

"And by indirect advice from Fond du Lac our affairs in that quarter are likely to be more advantageous than we could have expected from the state of that department at the beginning of last winter, and the large stories circulated by the N.W. Co. of the amount of property seized by Lord Selkirk's emissaries, who it now appears, restored all they had taken—the real state of the business, however, cannot be known till the arrival of Mr. Morrison, which I look for in 10 or 15 days."

And again on July 21, 1817:

"All the people of Lake Superior have come out and, with a few exceptions from almost every quarter. In the aggregate the returns are bad.

"Selkirk's emissary, in addition to the destruction of our adventure to Red Lake, did us a most serious injury in sending Messrs. Morrison and Roussain prisoners to Fort William last fall . . . (afterwards returned to their posts). Selkirk sent into that quarter last fall at different times not less than 12 canoes and 50 men . . . and, without scruple, introduced the goods which opposed us in the whole department of Fond du Lac, never finding it convenient to consult the collector of the customs or the agent of Indian affairs. . . . We have, however, had the good fortune to thwart most completely his ungenerous designs." . . .

Settlement with Lord Selkirk for the seizure of certain property and employees was later made, and the Hudson's Bay Company withdrew its operations to the boundary. The American Fur Company did not consider extending its posts to the boundary frontier until 1821, and these posts were not established until the following year. On September 1, 1821, Crooks writes to Mr. William W. Matthews, of Montreal:

"I should like to get a couple of good traders for the Rainy Lake department, and wish you would be on the lookout; should good people for that quarter be found, it must be known early, as we would order goods accordingly, and these people might in Montreal wait the arrival of the English goods."

On November 24, 1821, this company entered into a four-year contract with William Morrison for a salary of \$1,400 per annum to oversee their trade in the entire region of northern Minnesota. The contract, written by Crooks, is, in part, as follows:

. . . "And in addition that you will regulate and conduct the trade of all such Posts and Places as may be established by the American Fur Company in the country north of the Fond du Lac department, say in that region extending from the old Grand Portage on Lake Superior to the Lake of the Woods, or further if required within the limits of the United States." . . .

About this time the British Government had taken measures to regulate the fur trade in their dominions, very similar to those already taken by Congress. On November 31, 1821, Crooks writes to Astor relative to this new legislation and to their own extension into the Northwest:

". . . Since the British Government has legislated us out of Canada we shall next year occupy three posts within our lines from the vicinity of Rainy Lake to the Lake of the Woods. These are the remotest posts we can have on the north, and although we shall come in contact with the Hudson Bay folks along the boundary, the best hunting grounds are on the American side." . . .

Further, in regard to the supplies for the new territory, Crooks writes to Robert Stuart, the agent at Mackinac, on December 5, 1821:—

"Morrison will next year establish the Rainy Lake country and carry our trade as near as practicable to the boundary line. To do this effectually he is to get a Mr. McGillis, and he will make the necessary arrangements."

And on April 8, 1822, Crooks again writes Stuart:

"You are already aware that Morrison will establish some new posts along our northwestern border. The old Grand Portage is allowed to be within our line, and there the N.W. have always had a good little post, since they retired to Fort William. An outfit from the Fond du Lac department should be sent to that place under some active men; and in order to keep our opponents on their own side of the boundary, our clerks or traders are to be made customhouse officers, and as an additional security against the interfering with our Indians, the new station should be located as far from the boundary line as may be possible, having a due regard to the interest of the trade; and this will lessen the temptation which the rum of our adversaries would always be sure to create were our houses so near to theirs."

The liquor problem mentioned in the last letter proved to be a stumbling-block in the way of the whole undertaking of the American Fur Company in the Lake of the Woods region. The American traders were allowed to take no liquor whatever to the Indian country, while the Hudson's Bay Company with liquor were enabled to draw the Indians to the boundary and buy up their excess provisions, which resulted in literal starvation for the American posts along the boundary. In July, 1822, Stuart requests from George Boyd, the agent for Indian affairs at Mackinac, the right to import liquor into the Indian country for the particular use of the boundary trade in the Lake of the Woods territory.

During the early part of 1823 the American Fur Company and the Stone Bostwick Company combined, still keeping the old name. In writing to Mr. Stone relative to the state of their trade in the Northwest, Mr. Stuart brings up again the liquor question. He says:—

"But as at each post (say three in number) we come in immediate contact with the Hudson Bay Company we find it will be impossible to oppose them

successfully without having some liquor—last year our people were almost starved out and had to carry provisions from the interior posts, at least 500 miles, on dog trains—and all this in consequence of the H.B. Co. purchasing with whiskey what provisions the Indians could spare; as there is no remedy at present for the evil (for the British Co. come over to the line & draw over the Indians), I am confident Gov. Cass will at once relieve us, by giving permission to carry in say 20 barrels whiskey; & you may give him any pledge he may require that a single drop of it shall not be used elsewhere; both Col. Boyd and Mr. Schoolcraft would I am satisfied see the propriety of this; & be inclined to grant our request, but they might be averse to taking the responsibility . . .”

The agent for Indian Affairs, Major George Boyd, in July, 1824, granted a permit to Wm. A. Aitkin to take two barrels of liquor into the Indian country for use in the extreme northwestern frontier. The permit was never renewed.

Of the three posts of the American Fur Company, that at the mouth of Rainy Lake is the only one definitely located, although as elsewhere stated there seems to have been one at the mouth of Warroad River. The Indians have a tradition that on the Namakan River, which was at that time regarded as the boundary line, the American Fur Company maintained a small post on one side and the Hudson's Bay Company a post on the other.

When the matter of adjustment of affairs previous to consolidation with the Stone Bostwick Company in 1823 came up, it was conceded that the three northern posts, under conditions existing at that time, had little value. In fact the American traders began more and more to look to the south and west and to the Pacific region. In regard to the extensions in that direction, Crooks writes to Stuart on April 8, 1822:

“. . . For the South and West will eventually be our chief dependence and we had better prosecute that trade with vigor, before the door is closed against us by the enterprise and permanent arrangements now about to be matured by other adventurers.”

The date of abandonment of these American posts in the Lake of the Woods region is not known with certainty. In the minutes of the Council of the Hudson's Bay Company, held at Red River settlement in June, 1833, the following appears:—

“That the sum of Three Hundred Pounds Stg. be paid by draft on the Governor and Committee to Wm. A. Aitkin, Esqre.; the American Fur Company having withdrawn during the past Outfit from the frontier of the Lake Superior, Lac la Pluie, Winnipeg and Red River Districts, conformably to the terms of an engagement entered between Governor Simpson and Mr. Aitkin, as per correspondence dated Red River, 21st March, 1833, the said amount to be charged to the Lac la Pluie District, Ot., 1834.”

The same entry is repeated in the annual minutes of the council up to the year 1842. In the minutes of 1839 the name of Ramsay Crooks replaces that of Wm. A. Aitkin; and the minutes of 1840 add the following to the usual vote of £300:

“Information having been received through Mr. Keith from Ramsay Crooks, Esq., president of the American Fur Company, intimating the probability of Mr. W. A. Aitkin, establishing a trading post on the borders of Lac la Pluie district, near Vermilion Lake, with a view of carrying on a trade with the natives of that quarter, and Mr. Crooks, having requested permission to oppose Mr. Aitkin in order to restrain his encroachments upon the trade in Lac la Pluie district, it is resolved, that Mr. Crooks be requested to oppose him accordingly; that Chief Factor McDonnell be instructed to make the necessary arrangements for meeting the expected opposition with vigor; and that any additional supplies in men and goods required for that purpose be furnished him from Red River by C. F. Finlayson.”

Keating, in his *Narrative*, mentions a post of the American Fur Company on the south side of Rainy River, at or near the site of the present town of International Falls. He learned from the agent that the American Fur Company carried on a trade between Rainy Lake and Fond du Lac, by way of the Grand Fork, Little Lake Winnipeek, the Mississippi, Sandy Lake, Savannah River, and the River St. Louis. Incidentally, it may be noted that in 1819 Lord Selkirk proposed to the American Fur Company that they should establish a trading post "north and east of Lake La Pluie and the Lake of the Woods."

Dr. Bigsby, who made a tour of the Lake of the Woods and Rainy River in 1823, as secretary to the Boundary Commission under Articles VI and VII of the treaty of Ghent, makes a passing reference to the establishment of the American Fur Company, which incidentally throws a certain light on the rivalries of the fur traders. He says:

"Walking out the morning after our arrival (at Fort Frances) with Mr. W. McGillivray, the lieutenant governor, I saw on the opposite side of the river some buildings, and a tall, shabby-looking man angling near the falls. I asked my companion what all that meant. He replied 'the two or three houses you see form a fur-trading post of John Jacob Astor, the great merchant of New York. The man is one of his agents. He is fishing for a dinner. If he catch nothing, he will not dine. He and his party are contending with us for the Indian trade. We are starving them out, and have nearly succeeded.'"

Bigsby adds this dry comment:

"The expedients for preventing a rival from entering a rich fur country are sometimes decisive. Every animal is advisedly exterminated and the district is ruined for years."

NOTE.—Pages 53 to 59 are taken from the Commission's Report on Lake of the Woods, as they relate to the region covered by the present Reference.

SETTLEMENT

Settlement in the Rainy Lake District had its beginnings around the old trading posts of the fur companies. The earliest settlement seems to have been in the neighbourhood of Fort Frances, of the Hudson's Bay Company, which, it will be remembered, succeeded La Vérendrye's Fort St. Pierre and Rainy Lake House of the North West Company. About the same time settlement began at the lower end of Rainy River, near Hungry Hall, of the Hudson's Bay Company. From these two points, at either end of Rainy River, it spread very gradually up and down the Canadian side. The earliest settlement on the Lake of the Woods appears to have been in the vicinity of the Hudson's Bay Company's post at Rat Portage. A few years later farmers began to take up land on the south shore of the Lake of the Woods and on Rainy River, in the neighbourhood of the old trading post of the American Fur Company, where the town of International Falls now stands; on Zippel Bay; and around the mouth of Warroad River, where the same company is believed to have had another trading post.

The oldest living settler in the district was R. J. M. Pither who came into this part of the country in a birch-bark canoe in 1846, and was still alive at the time of the Lake of the Woods investigation. He was for many years agent of the Hudson's Bay Company at Fort Frances, and afterwards agent of the Department of Indian Affairs of Canada, with headquarters at Pither's Point. His home for many years stood a few yards from the site of the old Fort St. Pierre. When he first came into the district it was uninhabited except by Indians and a few fur traders. He lived to see it developing in every direction, with a number of growing towns on either side of the boundary, and railways running east, west and south; its waters the source of thriving fisheries; its forests and mines adding yearly to the wealth of two neighbouring nations; and **its harnessed water powers** furnishing the energy for several very important industries.

At the hearing at International Falls in 1915, in the Lake of the Woods Investigation, it was stated that the population of the town of Fort Frances, Ontario, was between 3,000 and 3,500. To-day it is about 5,500. It contains a number of industries, including large pulp and paper mills. Pither's Point was some years ago handed over to the town by the Government of Ontario as a municipal park. Fort Frances was incorporated as a town in 1903.

International Falls, Minnesota, was incorporated as a village in 1912, its first settlement dating back some years before that time. It was first known as Koochiching, the name later applied to the township and county in which International Falls lies. Large pulp and paper mills are located here. Its population is now about 6,000.

Smaller communities on the United States side are Baudette, Spooner, Clementson, Birchdale, Manitou, Loman, and Ranier; and on the Canadian side, Rainy river, Rapid river, Sleeman's, Stratton, Emo, and Roddick.

At the Minneapolis hearing in October, 1933, it was stated on behalf of Koochiching county that only twenty-five per cent of the land in the county was adapted to agriculture. The remainder of the county was best suited to the growing of timber, principally spruce and poplar. "The settlers in that county were attracted there by the industry now in charge of the Receivers. To a large extent these settlers still depend on the industry at International Falls for their livelihood. There are many farmers who have advanced far enough in their undertaking to produce their livelihood; but generally speaking, the larger part of them depend, to a greater or less degree, on what they can make in the winter time by cutting wood or timber and hauling or shipping it to the mills at International Falls." Generally speaking, settlement along the United States side of the waterways under consideration, above International Falls, is confined to Rainy Lake.

On the Canadian side, it is stated in the Brief filed by the Province of Ontario that: "With the exception of the municipality of Fort Frances, there is practically no habitation on the Ontario shores which would be affected other than a few summer resorts on Rainy Lake. The lands as a whole are not suitable for farming purposes and apart from the shore lands for summer resorts, are not suitable in the main for other than forestry and park purposes, so that the domestic relation is not serious."

The mayor of International Falls said that he had lived there for a period of twenty-eight years, before the dam was built or the power developed. "When I arrived at International Falls," he said, "the city consisted of a few frame buildings along the river bank. Fort Frances was there because it had been the Hudson's Bay post for some years prior to that time and a little larger settlement surrounded the post of Fort Frances then. For over a hundred miles along Rainy River and Rainy Lake and south for some seventy miles it was all primeval forest. It was unbroken at that time by trails, highways or railways. It existed as probably it had existed for ages and at that place there was no attempt to develop the water power resources. Along about that time capital saw the opportunities for power development, the possibilities of the place and acquired from the respective governments of the United States and Canada the right to construct that dam. As a result of the power developed through that dam, industries were established on that lonely river and now a population at International Falls of approximately 7,000 people is sustained almost entirely by their operations. Across the river there is a population of something like 6,000 people. Pioneers of limited capital, observing the opportunity which the power afforded, entered the territory, filed on claims and established their homes in Koochiching county. They located on the Rainy River, Rapid River, Black River and other rivers tributary to Rainy Lake which traversed that region I have just referred to."

NAVIGATION

In the Brief filed by the Department of Public Works of Canada, the interests of navigation are discussed in some detail. The Brief has this to say about navigation on Rainy River:

Canada "The Rainy River section covers the reach of the river between the Lake of the Woods and a point below the dam at the town of Fort Frances. Navigation in this reach at the present time, may be divided into two subsections.

First: Boats navigating between Lake of the Woods ports and that portion of the river extending from Lake of the Woods upstream about 13 miles to the town of Rainy River, Ontario. A list of these boats is as follows:

Warroad, Minnesota

Booth Fisheries, 1 boat, steam, reg. 8 tons, passenger, Warroad to Kenora, draft 5'.

Mitchell, 1 boat, gas, reg. 8 tons, passenger, Warroad to Tourist Camps, draft 4'.

Rainy River, Ontario

E. Calvert, 1 boat, steam, reg. 8 tons, passenger, Rainy river to Tourist Camps, draft 5'.

Dr. Waldron, 1 boat, gas, reg. 8 tons, passenger, Rainy river to Tourist Camps, draft 4'.

Second: Navigation in the river above the town of Rainy River, Ontario, to the power and control section of Fort Frances, Ontario—International Falls, Minnesota, 72½ miles above, is confined to lumber interests only; there being no passenger or freight transportation now in operation.

"The lumber navigation consists of gators and power boats used in rafting lumber serving different timber interests; these are of under 4-foot draft.

"The largest of these timber interests is in connection with the Watrous Island boom from which logs are loaded at Lomer, Minnesota, for rail carriage to the pulp, paper and lumber mills at the power and control section 44 miles above.

"The river from the Lake of the Woods to the power and control section 85½ miles above, was navigated up to 1915 by the passenger and freight steamer *Keenora* of 486 tons gross, 120 ft. in length, 28 ft. beam and 8 ft. draft, plying between Kenora, Ontario, Warroad, Minnesota, Rainy River, Ontario, and the town of Fort Frances, Ontario, opposite International Falls, Minnesota.

"This navigation prevailed only during such high-water condition in the river as allowed this passing the Long Sault and the Manitou rapids, which are 28 and 36 miles respectively above the town of Rainy River.

"At lower stages passengers and freight were transferred at the town of Rainy River to the steamer *Aguinda*, a flat-bottomed stern paddle wheel river boat of light draft, capable of passing the rapids and making the connection between that town and Fort Frances, Ontario.

"These boats were operated by the Rainy River Navigation Company, Limited, which discontinued service about 1916. Twenty-one trips were made in 1915. At the present time there is no recognized passenger or freight traffic."

The Brief then deals with aids to navigation, booms, bridges, ferries and improvements in Rainy River, the power control at International Falls—Fort Frances. It then discusses navigation on Rainy Lake.

"The Rainy Lake section extends from a point in the river immediately above the dam at Fort Frances to the upper end of Rainy Lake. Navigation on Rainy Lake includes that part of Rainy River above the control section at Fort

Frances, a distance of two and a half miles. It extends forty miles on the lake east to Kettle Falls and some twenty-eight miles north through the Canadian National Railways crossing.

A list of commercial boats follows, including four steam gators and three gas boats of the Shevlin-Clarke Company, four steam gators, two gas gators, two gas boats and one steam boat of the Mathieu Lumber Company, eight craft of the Ontario and Minnesota Pulp and Paper Company, Fort Frances Fish Company, and three other local interests, and about thirty gas boats employed by licensed fishermen, about equally divided between Canadian and American interests. There are also listed six private pleasure craft, gas boats, and reference is also made to approximately thirty light Canadian gas boats and the same number of American gas boats. Under Rainy Lake the Brief again deals with aids to navigation, booms, bridges, ferries, and expenditures for improvements.

Coming to the Namakan chain of lakes, the Brief says:

"The Namakan reach includes the chain of lakes consisting of Namakan, Kabetogama, Sand Point, Little Vermilion and Crane Lakes with their outfall and discharge control at Kettle Falls dam at the east end of Rainy Lake.

"The Kettle Falls dams were constructed by the Rainy River Improvement Company (a subsidiary of the Ontario and Minnesota Power Company) on plans approved under the Navigable Waters Protection Act—being completed in 1914. They are two in number, one in Ontario and the other at the international boundary between Ontario and Minnesota; they are of permanent masonry construction and fitted with controlled sluices and crest discharge weir. They are operated by the above-named company and allied interests under the supervision of the Department of Public Works and the United States Engineers' Office. A general plan of the Kettle Falls dam is shown on Plate 101 of the Report of the Consulting Engineers on the Levels of Lake of the Woods, 1916.

"Navigation above the Kettle Falls dams on the chain of lakes mentioned above, which compose the Namakan storage reservoir, is allied in a measure to that of Rainy Lake as the gators used by the lumber companies on these waters can haul themselves around the dam and be used for towing and other purposes above.

"Other craft such as used on these waters are readily moved across the control section where the difference in level is nominally 15 feet.

"Provision for a canal site across the section is reserved in the Order in Council granting approval under the Act.

"Other navigation on these lakes consists of small boats and canoes belonging to the tourist trade and to campers, and these, if powered, are of the out-board motor type."

Dealing with La Croix, Basswood, Saganaga and Northern Lights Lakes, the Brief goes on to say:

"Navigation on these upper lakes is confined principally to the lumber interests as on the Namakan chain, and similar conditions prevail but with more difficulty with regard to moving gators between them. Small boats and canoes of campers or tourists use these waters but it would not be practicable or economical to move other large boats between these lakes above the Namakan chain."

Discussing the relationship of the interests of navigation in the various lakes and waterways under consideration to the questions of the Reference, the Brief says:

"In giving consideration to the relationship of the storage proposals to the interests of navigation, it is desired that the Commissioners should keep in mind

the essential difference between regulation of reservoirs in the interests of navigation as compared with regulation in the interests of power.

“Navigation interests are best served by maintaining an established uniform level—or as nearly as possible a uniform level—throughout the navigation season, from month to month and from year to year. Such regulation permits of the construction of dockage facilities, the excavation of navigation channels and of harbours and of harbour approaches, etc., to a fixed plane or datum.

“On the other hand, in the regulation of reservoirs in the interests of power development, the primary consideration is to secure a dependable outflow from the reservoirs to meet the needs of power. This results in the fluctuation of surface levels in storage reservoirs, not only during each season but also over a cycle of years, when stored water is drawn upon to maintain a dependable outflow during seasons and periods when the natural run-off is deficient. Such regulation means the drawing down of the reservoir to its lowermost limit as frequently as the exigencies of the power demand in relation to the run-off requires.

“To maintain navigation on reservoirs regulated in the interests of power necessitates the construction of dockage facilities to provide for the complete range of lake levels from the uppermost to the lowermost limits of the reservoir and the excavation of navigable channels and of harbours and harbour approaches, etc., to accommodate shipping corresponding to the lowermost limit of storage in such reservoir.

“Briefly, storage in the interests of the development of water power is productive of water level conditions quite the reverse of those desired for navigation. Navigation requires uniform level—power requires a range of levels.

“Essentially, therefore, the storage which has obtained upon Rainy and Namakan Lakes and that which is proposed in the Upper Boundary lakes and which is designed to meet the requirements of power, is detrimental to rather than advantageous to navigation.

“A further basic consideration which it is desired that the commissioners should keep in mind is that the extent to which Rainy Lake and the Upper Boundary waters are being used for navigation purposes is not such as would warrant the incurring by the Department of expenditures for the improvement of navigation conditions other than such routine expenditures as are involved in the maintenance of the ordinary dockage and harbour facilities in these waters.”

Minnesota In his statement at the Minneapolis hearing, the Assistant Attorney General of Minnesota said:

“Let us consider next the effect on navigation of raising existing water levels and of authorizing the artificial raising and lowering of levels. We call attention to the fact that the new levels proposed by the Commission’s engineers, in the case of several of the lakes affected, are vastly higher than present levels. We also call attention to the fact that the border lakes are literally dotted with islands, not a score or a hundred, but thousands of islands; that the larger bodies of water are rough and dangerous for navigation during periods of even moderately high winds; and that these thousands of islands provide sheltered channels where canoes and small boats can travel in safety when the main body of the lake is not passable. If the water is raised fifteen or twenty feet most of these islands will be submerged. There will then be no channels which small craft can navigate with safety.

“Moreover, these islands will be changed from beauty spots to dangerous reefs, more dangerous than the present reefs because the location of the present reefs is known to the men who navigate these lakes, whereas the location of the new reefs would not be known. The present landing places, in some places beautiful sand beaches, would be submerged. If new water levels are authorized and if the stumps of the trees along the shore lines are not removed, these would

make all landing places along the new shore lines very dangerous for all manner of water craft. Finally, widely fluctuating water levels would make the construction of suitable docks expensive, and, in many cases, impossible.

"The State is further of the opinion that the present levels of the border lakes, in general, is sufficiently high for present navigation needs and that there would accordingly be no compensating advantage in raising the water levels to offset the disadvantages we have enumerated.

"The State, therefore, is of the opinion that the change in the levels of the border lakes proposed by the engineers of the Commission, from the view of navigation, would be very disadvantageous to the people of the state."

Quetico-Superior Council Mr. E. C. Oberholtzer, appearing on behalf of the Quetico-Superior Council, said:

"As far as navigation is concerned the only result I know of from the raising of the water has been that the one boat that travelled between Fort Frances and Kenora went out of business when the dam was built at International Falls and Fort Frances. The reason they gave us was that it was not possible to maintain a service in the lower Rainy River because of the closing of the dam over Sunday and the lowering of the waters just below the dam.

"There are some of the greatest inland cruising waters on the continent here. If there should be a lock at International Falls or a lock at Kettle Falls, it would be possible to travel all the way through these waters, something for which there is bound to be a demand at some time. It would be a simple matter to put in such locks. If that comes then more and more stress in the regulation of these waters is going to be on the thing that has given prime importance, and that is navigation. Any company must reckon with that.

"Now, as to the effect on wild life of these changes in lake levels. I may take the Namakan chain as a very good example. On the Namakan chain since the dam was built in 1914 there has been, I believe, a maximum fluctuation of something over seventeen feet, as much as thirteen feet in one year, and that I believe at one time in something like forty days on Namakan. There will be a greater fluctuation than ever existed in a state of nature on these lakes, a fluctuation that means no dependable level at all. There have been summers on the Namakan chain of lakes when the summer level for navigation was ten feet different from another summer. I believe those two summers were side by side. They were very close, at least.

"Under those conditions which have existed continuously since the dam was built, it is impossible to have any sort of provisions for navigation, or to have any sort of ample boat houses or docks. It is perfectly ridiculous to speak of having facilities on these lakes that are adapted to the present level, because, as a matter of fact, there is no present level on these lakes. Nobody knows what the level will be. I do not know at my home on an island on Rainy Lake, where I have lived for years, what the level will be. Sometimes it has been up in my house; sometimes it has been so low that I could not get near parts of my island. There is only one kind of a dock you can have under those circumstances; that is a floating dock, if you are lucky enough to keep it off the rocks when the water drops. That situation affects towns where people go to buy. It affects Fort Frances, Ranier and International Falls, the approaches by which those people should go up on the lake."

FISHERIES AND GAME

Minnesota In his testimony at Minneapolis, the Assistant Attorney-General of Minnesota, Mr. M. N. Orfield, dealt among other things with the effect of raising the levels of the border waters upon fish, game and fur-bearing animals and birds. "It is recognized," he said, "that this is a highly complicated question, that, for instance, with reference to certain species of fish the effect might be unfavourable and with reference to other species, favourable; that with reference to a term of five or ten years the effect might be unfavourable and with reference to a term of fifty or a hundred years the effect might be favourable.

"On the whole, however, the state is of the opinion that any raising of the present levels of the border lakes will, at least for a number of years, be unfavourable to the propagation of fish in these lakes by compelling many species of fish to seek new spawning grounds less favourable than present locations and by entrapment of fish in inland lagoons when the water is drawn down in the reservoirs; that the raising of the water levels and the authorizing of fluctuating levels artificially controlled will be unfavourable to certain fur-bearing animals, especially muskrats, whose existence in winter often is dependent upon maintaining a passageway from their houses to the water in the lake.

"Wide fluctuations in winter water levels required by storage projects would cut these animals off from the water in which they feed in winter. Dr. T. Surber of our Division of Game and Fish reports cases where thousands of muskrats have died in winter from starvation by reason of wide fluctuations in lake levels. The state is further of the opinion that a raising of the present levels of the border lakes will destroy some of the nesting grounds of certain aquatic fowl and that it will take nature many years to provide new nesting grounds of equal value."

Ontario In the brief filed by the Province of Ontario, the following is said as to the scope of fishing interests on the Ontario side of the area under investigation:

"The commercial fishing industry in Rainy Lake is of considerable importance. The total value of the gear used by the fishermen in 1932 amounted to approximately \$26,700. Yellow pickerel (pike-perch), pike and whitefish make up the bulk of the catch, but perch, tullibee, sturgeon and coarse fish, for example, suckers, mullets and catfish, are also taken in appreciable quantities. The total catch of all commercial species of fish taken from the lake, during the past year, amounted to 365,400 pounds approximately, netting \$31,624 to the fishermen.

"In Namakan Lake the commercial fishing interest is also important, the fishermen having approximately \$2,800 invested in gear. The total catch in 1932 amounted to approximately 20,000 pounds, which consisted of whitefish, yellow pickerel (pike-perch), pike, sturgeon, and tullibee (herring).

"Non-resident angling licences in Rainy River district netted a revenue in excess of \$9,000 in 1932 and an extensive amount of angling is done in the boundary waters under discussion". . . .

"The interest of the Department of Game and Fisheries (of Ontario) in connection with changing water levels, centres on the effects of such conditions on fish, the life on which fish depend and other animals which make their home in, over or near shallow water, and the following information will indicate the department's reasons for opposing the proposal of changing the water levels of Rainy Lake and other upper waters.

"1. The introduction of dams is primarily for the purpose of developing navigation and power and hence the protection of fish and other aquatic life is considered of secondary importance by owners and operators of such obstructions.

"2. No matter how desirous operators are to protect aquatic life, it is often impossible to do so and at the same time meet with the demands of navigation and power.

"3. Lowering or raising water levels unduly above or below normal, as the case may be, is unquestionably detrimental. Lowering water levels leaves vegetation, either submerged or semi-submerged, and bottom fauna high and dry, causing their destruction. In some instances when water recedes fish are entrapped in holes or pockets of water and eventually succumb, due to lack of air, lack of water current or food. It must be remembered that certain species of bottom fauna are restricted to certain well defined areas and depths. The same thing applies to vegetation. Where conditions are suitable in shallow water, there is a more luxuriant growth of the various kinds of aquatic life than in deeper water. Vegetation not only harbours insects, but also supplies the water with oxygen to a certain extent.

"Such fish as the common sucker, whitefish and sturgeon are dependent on bottom organisms for their food. The common sucker and sturgeon frequent shallow water while the whitefish ranges from deep to shallow in its feeding habits. Maskinonge, pike and bass in their immature stages are to a large extent insect feeders, that is they either feed on the insects which fall into the water from vegetation or on insect larvae on the bottom. Crayfish, which abound in shallow water also are of importance in the diet of bass. Minnows, which are a staple food for fish of many kinds, for example, bass, pike, pickerel, maskinonge and perch, obtain most of their food in inshore protected shallow water areas. Studies show that minnows, and the immatures of nearly all species of fish feed on the free-floating or free-swimming or attached microscopic organisms or the larger forms of life such as insects. There are also carnivorous minnows which feed on small fish.

"If on the other hand water floods shore vegetation, causing decay and an unusual accumulation of organic matter, which condition is avoided by our gamier varieties of fish, the shallow water-loving species must adapt themselves to the new conditions, migrate to more favourable areas or succumb. When the waters return to a normal level again it takes considerable time to bring about the re-establishment of suitable water conditions, a distinct disadvantage to the fish and fishing. There is such a complex relationship or interdependence among all the organisms inhabiting a body of water that anything which upsets a balance or arrangement more or less fixed by natural conditions will ultimately affect fish life.

"4. The more important species of game-fish and commercial fish which would be affected by changing water levels in Rainy Lake and upper waters are: small-mouthed black bass (introduced to the waters of Rainy Lake by this department), pike (maskinonge), yellow pickerel, whitefish, herring, lake trout will be found in the deeper waters of the watershed, for example, La Croix Lake. No mention has been made of the forage fish, but these must not be overlooked, for example, immature suckers, perch and small minnows which are important items in the diet of pike, pickerel, bass and maskinonge.

"The ways in which these species may be interfered with as regards food and shelter has already been pointed out, but there is another way in which changing water levels exert ill effects and that is by interfering with successful reproduction. It is well known that most species of fish, with the exception of certain chubs and ciscoes, migrate to shallow water to spawn. For all practical

purposes we may divide fresh water fish into two categories from the standpoint of spawning, namely, the spring or early summer spawners and the fall spawners. The spring or early summer spawners are pike, maskinonge, yellow pickerel, black bass, perch, suckers, other coarse fish and minnows. The fall spawners are primarily lake trout and other trouts, with the exception of the rainbow trout, which is an introduced species, whitefish and herring.

**Spawning
Habits of Fish
of Rainy Lake
District**

“ For the information of the Commission, the following may be considered a concise statement of the spawning habits of fish in the Rainy Lake and upper waters watershed:—

“ Pike and maskinonge spawn as soon as the ice goes out in the spring. Their spawn is laid in very shallow water among the vegetation. They also run up streams tributary to lakes for this purpose. It is a well-known fact that maskinonge will spawn in water from 15 inches to 20 inches in depth. Spawning has been found to commence at a temperature of 49 degrees F., approximately, and to be completed in a week's time with a temperature of 58 degrees approximately. The temperature throughout the spawning and hatching period ranges from 46 degrees F. to 66 degrees F. On account of the shallowness of the water in which this important game fish spawns, it is evident that small changes in water levels during their spawning period may mean a total loss of deposited spawn. By artificial culture it has been found that under favourable spawning and hatching conditions, the period of incubation of the eggs is approximately 12 days. During the months of April and May changes in water levels up to 4 feet may be decidedly detrimental to the satisfactory development of pike and maskinonge eggs.

“ Yellow pickerel spawn on the sandy shores of lakes or run up tributary streams to the first rapids, or even past the first rapids. They spawn in water from 1 foot to 10 feet and deposition and development of the eggs depend on the temperature. The exact spawning dates fluctuate from season to season, each species having a fairly definite optimum. The farther the temperature is from this optimum, the longer the hatching time. For example, it has been found that 57 degrees F., the hatching time for pickerel, covered a period of one week; 48 degrees F. from 18 to 20 days, and 40 degrees F., 28 days. The spawning season of yellow pickerel in Rainy Lake watershed is satisfactorily covered by our closed season, which now reads from April 1 to May 15.

“ Small-mouthed black bass were introduced to Rainy Lake by the Ontario Department of Game and Fisheries. Black bass construct their nests in shallow water and spawn when the temperature registers 61 degrees to 65 degrees F. It must be pointed out here that the female does not deposit her eggs on any particular date according to the calendar, but waits until the water reaches the temperature stated. The depth at which bass spawn depends on the environment. The locations are chosen by the male with great care. They like a shallow place where the water is from 18 inches to 2 feet deep in gravelly bays where there are such obstructions as logs, big rocks or banks affording protection on three sides from wave action. In such an environment the male fish guarding the nest will have to look out for enemies on one side only. Naturally, in the Rainy River region the advent of spring is generally some weeks later than in southern Ontario and bass will spawn during the latter part of May, June and July in that region, the spawning period being governed by the temperature of the water, as pointed out above.

“ Nothing has been said about the spawning of forage fish but with protection given to those mentioned as far as water levels are concerned, the other varieties will also be protected, since their spawning periods fall within the ranges specified.

"The fall spawners, namely, lake trout, herring and whitefish, also repair to shallow water for the purpose of depositing their spawn. The eggs are laid on shoals, in the crevices among the rocks; the development is slow and it is only when the water warms up in April that the eggs hatch. The spawning shoals may be rocky or sandy.

"The spawning season of the whitefish in the Rainy lake area extends from October 24 to December 1 on an average, and the spawn is laid in water from eight feet up to twenty-five feet deep.

"Herring commences to spawn later than whitefish, namely in November in water from five to ten feet. They also hatch in late April or early May. The period of incubation depends upon the temperature and weather conditions.

"It should be stated that the fry of the herring and whitefish, about two weeks after hatching, school and migrate to shallow water (one foot in depth or even less). When they are about one month old they disappear into the deeper waters of the lake.

"Lake trout abound in the deep water of lakes 50 feet and over where there is a low temperature and a suitable supply of oxygen. Rainy Lake and river connections being shallow are not in the main adapted to this species. However, deeper waters in the chain, for example La Croix and Basswood Lakes, contain this species.

"Lake trout spawn over rocky shoals at depths from four to twenty feet. In exposed or open waters very shallow water is avoided on account of wave and ice action. The spawning season of lake trout in lakes in the region under discussion would be from September 15 to October 31.

"5. The importance of the tourist trade to Ontario is difficult to compute. The greater part of this trade is influenced largely by the attractions and fishing possibilities of our waters. Anything therefore, which interferes with the fishing is bound to affect this trade adversely.

SANITATION

Ontario In the Brief filed by the Province of Ontario at the Winnipeg hearing, 1933, it is said that the raising of the levels of Rainy Lake "would involve a very considerable expenditure for the general protection of Fort Frances." The Brief goes on to say:—

"Apart from the conditions obtaining in the municipality of Fort Frances, it is not considered that there would be any serious objection from a public health standpoint arising from the development of projects such as those suggested by the questions of the Reference."

In the Final Report of the engineers to the Commission, is incorporated a report prepared by George H. Ferguson, Chief Engineer of the Department of Health of Canada, with the co-operation of other officials, on the effect upon sanitation in the town of Fort Frances of any increase in the levels of Rainy Lake. The report is as follows:

"With the construction of dikes or retaining walls along the waterfront, the discharge of surface water into the river from the properties in rear of the dikes would be cut off and suitable provision would have to be made for the collection of the surface water from the entire drainage area in rear of the dikes, the drainage from which now flows into the river by gravity. Sub-soil drains should be laid back of the retaining walls or dikes to remove any seepage of water so as to prevent a rise in level of the ground water, and it may also be necessary to lay several lines of drain tiles across the adjacent lands.

"On account of the character of the soil, a mixture of sand and decayed material of former muskeg, drainage to take care of seepage incidental to an increase in the level of the surface of Rainy Lake and Rainy River would be

necessary. The level of the ground water is due not only to the upward pressure from the underground sources but to the precipitation and level of the surfaces of Rainy Lake and Rainy River.

“The proposed increase in the elevation of the surface of Rainy Lake and Rainy River would raise the ground water level to a corresponding amount and would greatly increase the difficulty and expense of making excavations which may be necessary in maintaining and repairing water mains and sewers or in laying new water mains or sewers.

“The amount of ground water entering sewers varies with the character of the soil, the natural level of the ground water with reference to the level at which the sewers are laid, and the tightness of the sewers. If the leakage into the sewers is great enough to serve for the entire removal of the ground water from the drainage area, then all that part of the rainfall not otherwise carried off and evaporated, will ultimately find its way into the sewers as ground water. This proportion will be larger if sandy or gravelly soil, and in a flat country, and will be smaller with clayey or impervious soils and with steep slopes.

“*For sandy soils approximately a thousand gallons per day per acre may be taken as a rough average amount.* In the spring of the year the maximum rate of discharge of ground water may be expected to be two to four times the average rate for the whole year.

“To avoid carrying large quantities of storm water through the sanitary sewers a storm sewer should be constructed for the district adjacent to the water front and discharge below the Power Company's dam.

“The function of a municipal sewerage system is to remove the sewage quickly from the houses and to dispose of it in such a manner as not to create objectionable conditions either in the community itself or in neighbouring communities.

“Except in special cases, sanitary sewage should not be mixed with storm water or roof drainage. It is a well recognized principle that the less diluted domestic sewage is, the more readily it lends itself to the ordinary processes of bacterial purification, and the more constant the rates of flow will be and the more efficiently sewage disposal plants may be operated. Even where a sewage disposal plant is not installed at the time sewers are constructed, it is good practice to provide separate sanitary sewers.

“Closely allied with the consideration of separate sanitary sewers, is the question of making such sewers water-tight. It is frequently necessary to lay sanitary sewers below ground water level and crossings under creeks are quite common.

“The necessity for making sanitary sewers tight is two-fold: first, to keep down ground water infiltration; and, second, where sewers are above ground water level, to prevent seepage of sewage out of the sewers into the surrounding ground, which may pollute wells or may pollute water in mains where there are leaks and water is temporarily shut off, or a negative head is produced in the main by the suction of fire pumps, or for other reasons.

“The sewerage system of Fort Frances covers only a portion of the town, including parts of Sinclair, Nelson, Church, First, Second, Third, Fourth and Fifth streets, and Central, Mowat, Portage, Armit, Grove, Mosher, Butler, and Minnie avenues.

“The tendency of a regulated level higher than the natural level would be to increase the volume of flow in the sewers; it would also tend to make it difficult to keep hydrants in the area subject to flooding from freezing, as the hydrant barrels could not be drained in the usual manner and would have to be either pumped out or connected with the proposed storm sewer.

“On page 42 of the Final Report of the International Joint Commission on the Pollution of Boundary Waters Reference, Ottawa-Washington, 1918, attention is paid to the sewage pollution of the Rainy River and other boundary rivers, and, on page 43, there is the following statement:

““In the case of these streams any remedial works installed in compliance with existing legislation and the regulations of the states and provinces directly affected should have in view the safeguarding of international interests, present and future. These interests require as a minimum measure the planning of a sewer system with provisions for the collection of sewage at one or more points suitable for treatment, the installation of tanks or other devices sufficient for the removal of the larger portion of the suspended solids capable of settling and ample equipment for the chemical disinfection of all sewage at such times as may be found necessary.””

“This has reference to household sewage as unmixed with storm water, ground water, etc. As far as the sanitary question is concerned, any additional installation or operating cost necessitated by a given system of regulation over and above that required under natural conditions, would be properly chargeable to the project.”

LUMBERING

Ontario It is stated in the Brief filed on behalf of the Province of Ontario that:

“The large amount of timber which will be destroyed in the Quetico Provincial Park bordering on La Croix, Basswood and Saganaga reservoirs, is considered of much greater value to the province as standing timber than what would be obtained for the same at commercial rates, but we have not assumed this in arriving at our stated value of \$378,592.88.

“The proposed maximum level for storage in Northern Light Lake is 7½ feet above the natural high water level. The effect of this storage and damage thereby is entirely within the province and accounts for a considerable percentage of the total storage proposed.

“The area of land affected by storage in Ontario is 58½ square miles and assuming that this must be cut and cleared and left in a reasonable state for landings on the shore, at any water level, the cost of such work would be at least \$75 per acre, or a total of \$2,808,000.”

With respect to the relationship of the timber interests to the subject-matter of the Investigation, it is submitted on behalf of the Province of Ontario that:

“The program of increased or additional storage suggested in Question (1) would involve the flooding of important timber areas. There would be no benefit accruing to the timber interests from the proposals. On the contrary, the flooding involved would necessarily destroy the timber affected. In any project which might be proceeded with, the Ontario Department of Lands and Forests would insist upon the salvaging of the timber and the clearing of the foreshores to such extent as it considered necessary to protect its timber interests. In other words, the relationship of the timber interests to any program of storage development resolves itself into a question of the clearing costs which would be imposed upon any definite project brought forward.

“With regard to Question (4), it is to be pointed out that when the dams at the outlet of Rainy Lake and Namakan Lake were constructed, no steps were taken to clear the flooded land. The flooded timber was killed. The timber interests have secured no benefit from the present storage on Rainy Lake and on the waters controlled by the dams at Kettle Falls, but, on the contrary, valuable timber has been destroyed without compensation.”

Minnesota In his statement at the Minneapolis hearing, the Director of the Division of Forestry of the Department of Conservation of Minnesota said:

“The matter of flooding of forest lands for water storage or other purposes is one of land use and a decreasing of the area of forests for timber production by that many acres. Any suggestions or recommendations that I may have in the matter, therefore, will be based on the effect of such flowage or change of use on fire protection, fire patrol, scenic values of the forest, and other uses of the forest other than the growing of timber. In order to make a public forest pay the greatest returns, all projects secondary to timber growing must be developed to their fullest extent because on much of the northern lands of the state of Minnesota timber grows so slowly that wood production alone will not pay the way, particularly along our northern rock outcrop and swamp lands.”

“Plans are not only in the making for the development of these areas but funds have been set aside for the purchase of lands in these areas valuable to the public for recreational and scenic purposes. This acquisition will include valuable virgin forests still uncut and in their natural state to the water’s edge on lake shores affected by the proposed project.”

RECREATION

Minnesota The Assistant Attorney-General of Minnesota in his address before the Commission at Minneapolis said:—

“We consider next the effect of the proposed plan of the Commission’s engineers on the scenic beauty and recreational advantages of the border lakes and the territory adjacent. Among the many striking and beautiful features of this region are the numerous islands that dot the surface of nearly every lake, most of them rocky, but nevertheless giving foothold to various kinds of coniferous trees. The trees and other vegetation come almost to the water’s edge. The shore lines in many cases are strewn with boulders curiously marked by thousands of years of wave-action. Here and there at somewhat remote intervals are beautiful sand beaches, of great value as bathing beaches and landing places for boats. Literally thousands of miles of such shore lines are involved in the engineers’ plan. It takes little imagination to realize that these shore lines, which it has taken nature centuries to build, cannot be destroyed and other shore lines be created at higher levels which will be at all comparable in beauty to those destroyed.

“Most of the islands would be covered by water. The beautiful cataracts and waterfalls in the rivers which link the border lakes would be submerged and silenced. If the timber in the submerged area should not be removed before flooding, the shore lines would be hideous with the trunks of dead trees. If the timber were removed, but the stumps not removed, the landing places would be unsightly and dangerous.

“More and more the wilderness area which is the drainage basin of Rainy Lake has come to be the playground of the people of this state and of this nation. It is the only considerable wilderness area in the north central part of the United States and from the point of view of scenic beauty it is one of the most attractive regions in the United States. There is accordingly a very special reason for conserving the beauties of this region.

“But the question may be asked: What is the value of such scenic beauty? And I reply by asking: What is the value to the United States of the falls in the Yellowstone River in Yellowstone National Park? How much would it take to buy Bridal Veil Falls in the state of California? I ask these questions, not with the hope of finding a unit of value with which to measure scenic beauty but to emphasize the fact that it may have almost inestimable value.

"From the point of view of recreational advantages there is another reason why this area should not be encroached upon by additional dams. Charm is lent to this region because the big game animals, notably deer, moose and bear, are still found there in abundance. If the border lakes are to be dotted with dams, power houses and power lines, this game will retreat to regions more remote.

"The state accordingly is of the opinion that the plan of the Commission's engineers would result in irreparable injury to the scenic beauty of the border lakes and connecting waters and to the recreational advantages of the region adjacent."

Quetico-Superior Council

Mr. E. C. Oberholtzer, speaking at Minneapolis on behalf of the Quetico-Superior Council said:

"It is our contention that the greatest resource of that area at the present time, the one which promises the most for future development, the one which would require the least expenditure by the people of the two countries, is the resource which is dependent upon the thousands of connected lakes lying within that area. Particularly I feel that Ontario has an unparalleled opportunity because it has something there just across the border that is now coming into demand as never before and undoubtedly will be in far greater demand having a monopoly of resources of unique value in these lakes, whereas on our side there are millions of people looking for just such a place. There is an immense market for the very thing required for the complete fulfilment of that opportunity and that is that these lakes, without crippling the province, or equally on our side without crippling our state or possible industries, shall be maintained in a state of nature; that it shall become known to the people of the two countries that these countries intend to co-operate for the purpose of ensuring the people who come into the area not only to visit it but to invest in camps, hotels and summer homes, against anything that is going to cause their investments to deteriorate. It may well be supposed that if one has a home on Rainy Lake and power development occurs fifty miles away on some other lake in the Rainy Lake watershed, even though that power development may be at variance with a state of nature, it is not going to affect that investment down on Rainy Lake. I can assure you that nothing could be more incorrect as an assumption because the people who come to build in this area, who even now without any solicitation are investing hundreds and thousands of dollars there, are coming not merely because they have a site on Rainy Lake or Lake Vermilion or somewhere else, but because they are enabled to come in, to start on a route already marked out, to stop at forest camps and to follow the water. These people are not going to come here if those things which appeal to them are to disappear. Their investments may become absolutely worthless, especially if these developments go further and actually affect the area and the shores of their own property as there is a danger of their doing. . . .

"It is our contention that you cannot in the slightest alter the state of nature in this area of these watersheds without tremendous reverberations all through the age-old scheme of nature. That contention is based on actual observation, such observations as those of the man who appeared here yesterday from Crane Lake and who told of the fish that were left dying in the pot-holes of Namakan Lake when the bottom of the lake dropped out. But they are fully sustained by very able contributions from a scientific point of view which we would like to have entered in the record but will not take the time now to discuss with the Commission, the time being short. These scientific papers have been prepared by men well qualified, able men in their profession, who have made definite studies in the area. One of them goes every year into the Quetico to study these various things.

"It is not alone due to the fluctuations, but it is a fact that the character of the water changes. When you get a greater depth you change the oxygen content down below. Those things are clearly shown in these reports. . . .

“ Supposing we succeeded in getting the two governments finally to agree to some sort of uniform policy on the two sides of the boundary, our idea is that there should be instituted some sort of zone, planned by the governments, which would concentrate developments at existing communities. For instance, in Ontario, we have the town of Fort Frances beautifully situated on an historic point visited by thousands of people every single year, right at the entrance to this magnificent lake land. Hundreds of people make trips up there every summer by canoe or gasoline boat. There are hundreds and thousands of dollars of investments on the Ontario side of Rainy Lake in summer homes and in addition you have the railroad running the whole length of this watershed, the Canadian National Railway running down to Port Arthur and passing through little towns all along the line. By proper zoning it would be possible at Fort Frances and at these little towns along the railroad to have the finest opportunity for entrance to this lake land through existing facilities. There might be concentrated facilities for summer homes, camps and hotels, without building any more roads and without any expense to the province.

“ The same thing could be done on the American side because you have a region already threaded with waterways which provide the finest possible mode of travel in the summer. You must provide in the future for the people who want to go there if the province of Ontario and the state of Minnesota are to benefit by the tourist business; you must provide facilities and the thing to do is to provide these facilities where there are existing communities and where there are already roads and railways. You are building from Winnipeg a road running through that country to Fort Frances. That means that people from the west are going to be able to come into this lake land district. On the other hand, you have roads from Port Arthur and at some time there may be a road along the north shore of Lake Superior. If that road should be built, and it has the possibility of being the most wonderful scenic route on this continent, hundreds of thousands of people will visit this beautiful region provided of course there are facilities available in the area. The question is: Is there to be some great attraction at the end of this road; is the road to have at the terminus something of very great value to bring these people or are we going to permit the same sort of unregulated development that has existed in the past in this watershed on our own side and to some extent on the other side?

“ If you give to the thousands and hundreds of thousands of people who are now going out to great National Parks and are becoming tired of them because all they can do is to drive through them, an entirely new appeal in an area under a great plan whereby the two governments are co-operating without giving up any sovereignty or administrative functions whatever, but are merely co-operating to some great end and are giving this some name that they feel is going to recognize the importance of the area; then we feel that is going to be a great lodestone, and there are great numbers of people who will come into that region.

“ Ontario has pointed the way for us. Ontario very wisely in 1909 set aside this great area known as the Quetico Forest Reserve, something like one million acres in one solid block, containing some of the most beautiful lakes on this continent. Ontario unofficially sent a representative to Saint Paul and to Duluth and told what they would do if the United States would take some similar action. It was brought to the attention of President Theodore Roosevelt at that time, who promptly set aside Superior National Forest, some million and a half acres in its outer boundaries, but with this difficulty, that the United States, unwisely and unlike Ontario, had parted with a great deal of its land by selling in fee simple, and there has remained ever since the difficulty of the private lands within the area, and the United States has been forced to buy back these lands and will continue to buy them back until probably there will be an investment by the United States of four or five million dollars in repurchasing con-

trol of this area, until they have an area, including all strictly forest lands, that are unsuitable for agriculture or industry, with the idea of keeping a continuous forest such as is kept in areas in Europe, out of which can be taken surplus timber under careful modern forest practices.

"Ontario has given us leadership in other respects, because on Rainy Lake they have adopted the extremely wise problem of keeping many beautiful islands free of logging, so that some of the finest wooded islands anywhere are to be found on the Ontario side of Rainy Lake, with the result that an increasing number of people from the United States, both men of very little means who can come only for summer months, and men of very great wealth, are coming to Rainy Lake and taking advantage of the situation. They are developing homes there. Some of them have spent as much as a hundred thousand dollars. Those are taxable values which have only begun and which are bound to mount, if the lake is protected, to millions of dollars.

"I know from the records of our office where we are in touch with people all over the United States, that there are great numbers of people at the present time waiting to go into that area, waiting to spend large sums of money close to the main centres like Fort Frances or Port Arthur and some of these towns along the railroad; not only for summer homes and camps and trails, but for homes where companies like Sears Roebuck can have the facilities for their employees to go year after year. That is something that is inevitable. It is just a question of whether the two countries are going to act in time to make the region attractive for these purposes.

"Ontario, moreover, has adopted an extremely wise policy on Rainy Lake in the sale of its land. In the beginning, when I first went there, they did permit people to take up islands regardless of their size, charging a certain fixed price per acre. They found that these islands were getting into the hands of speculators. For a while they withdrew the islands and then finally reopened them under a plan whereby the people could come in and take a very limited amount, four or five acres, upon which they must put up a \$500 improvement within eighteen months, and which they could not use for speculative purposes.

"We feel that the Governments might permit regulated settlements for these purposes on lakes like Rainy Lake, along the roads that are in contact with the railroads now. They might permit leaseholds. We hope they will keep the greater portion of the area a wilderness so that the people will feel when they make their investment there much as they do when they build on the limits of a city park; that they are getting a property that is protected, and that they may enjoy these pure waters and see the Indians and the waters as they were originally.

"We feel that there can come out of that area every year an average of not less than half a cord to two cords of wood per acre, without in any way damaging the forest but building up a great forest; that you will have there such a forest as has never been known since the first white man came, a forest that will dominate the region, a forest that is indispensable to every industry there. That should be done and these upper waters should be made free from encroachment until such time as there should be some great public need.

"We feel if that is done for fifteen or twenty years there will never be any change, because we believe the economic factors on our side will be too powerful to contemplate taking these resources and using them for anything else."

Izaak Walton League At the same public hearing in Minneapolis, Dr. Aaberg said, on behalf of the Izaak Walton League:

"The attitude of our organization is that we need in the United States areas where people can get away from the dust of the automobile road, from factories and city life, and where they can spend a month or two enjoying the beauties of nature and engaging in recreational activities such as fishing and

hunting. We believe that will have an effect upon the people of our country more far-reaching and valuable than the small amount of additional employment that might be furnished. In other words, we believe that the value of this area is very much greater as a recreational area, a wilderness, available to the centres of population, than it ever could be as an industrial area, and that this should be of far more consequence to this Commission in determining the proper uses to which it shall be put than the small industrial development which might be effected."

International Park The following resolution, adopted at the national convention of the American Legion, the principle of which was also endorsed by the Canadian Legion, was presented to the Commission at Minneapolis:

"Whereas in Northern Minnesota the Superior National Forest includes within its borders a unique network of interconnecting lakes, and

"Whereas this wooded lakeland stretches far across the unguarded border into the Province of Ontario where the Quetico Provincial Park forms a counterpart to the Superior National Forest, and

"Whereas there has been formulated for the preservation of this region a plan which has been endorsed by this country's highest authorities on forest and wild life and which has also received the approval of the government departments in whose hands these matters lie, and

"Whereas such plan contemplates, if possible, joint action with the Dominion of Canada and the province of Ontario to the end that as much as is feasible of the Rainy Lake watershed be set aside to be used first for the purpose of reforestation, and secondly to provide for our peoples and our peoples' children a vast area of rare beauty which by international agreement shall remain for all time undespoiled, and

"Whereas we believe that such a common enterprise would form a fitting tribute to the century of peace that has existed between ourselves and our great neighbor to the north,

"Now therefore be it resolved that the American Legion in convention assembled at Louisville, Kentucky, September 30 to October 3, 1929, endorses wholeheartedly this program;

"Be it further resolved that it is the sentiment of the American Legion that this great undertaking, being conceived in the spirit of international friendliness and good will, should accordingly be done in the name of peace and dedicated as a memorial to the service men of both countries who served as comrades in the Great War;

"Be it further resolved that the National Commander shall appoint a committee of three to confer with the service organizations of the province of Ontario and the Dominion of Canada and to report to the National Executive Committee at its midwinter meeting the sentiment of the service men of Canada on this proposal;

"Be it further resolved that National Headquarters shall inform the State Department at Washington of the American Legion's endorsement of this program and of the active desire of the American Legion to assist in any way within its power to achieve for the United States and Canada on their international boundary this great peace memorial dedicated to the men who served in the war."

A resolution along similar lines was adopted by the Canadian Legion at its annual convention held in the city of Regina on November 25 to 28, 1929, a copy of which resolution was also filed with the Commission.

LAKE OF THE WOODS REPORT

It should be added that in the Appendix to the Report of the International Joint Commission on the Lake of the Woods Reference, 1917, detailed statements will be found of the early history of the Lake of the Woods region, of which the area now under investigation forms a part. This Appendix covers the early history of Rainy Lake and the boundary region above Kettle Falls, the early fur trade, beginnings of settlement, the fisheries, lumbering, boundary questions, water supply and sanitation, mining, navigation, recreation, power development and agriculture.

DIVERSIONS

Particular attention may be directed to Section xiii of the Appendix, which deals with Diversions from the Lake of the Woods Watershed. In its Conclusions and Recommendations in the Lake of the Woods Reference, the Commission said: "It is further recommended that, as a matter of sound international policy, neither Government should permit the permanent or temporary diversion out of the watershed of any waters within its jurisdiction which are tributary to the boundary waters under consideration, without first referring the matter to the Commission for such recommendations as it may deem appropriate". Proposals involving a temporary diversion were brought before the Commission in the present investigation.

This recommendation of the Commission was accepted by both Governments and embodied in Article XI of the Convention signed at Washington, February 24, 1925, as follows:

"No diversion shall henceforth be made of any waters from the Lake of the Woods watershed to any other watershed except by authority of the United States or the Dominion of Canada within their respective territories and with the approval of the International Joint Commission."

CONVENTION AND PROTOCOL

BETWEEN *His Britannic Majesty in respect of the Dominion of Canada, and the United States, for regulating the level of the Lake of the Woods and of identical letters of reference submitting to the International Joint Commission certain questions as to the regulation of the levels of Rainy lake and other upper waters.*

“His Majesty the King of the United Kingdom of Great Britain and Ireland and of the British Dominions beyond the Seas, Emperor of India, in respect of the Dominion of Canada, and the United States of America,

“Desiring to regulate the level of Lake of the Woods in order to secure to the inhabitants of Canada and the United States the most advantageous use of the waters thereof and of the waters flowing into and from the lake on each side of the boundary between the two countries; and

“Accepting as a basis of agreement the recommendations made by the International Joint Commission in its final report of May 18, 1917, on the Reference concerning Lake of the Woods submitted to it by the Governments of Canada and the United States of America,

“Have resolved to conclude a Convention for that purpose and have accordingly named as their plenipotentiaries:—

“His Britannic Majesty, in respect of the Dominion of Canada: The Honourable Ernest Lapointe, K.C., a Member of His Majesty’s Privy Council for Canada and Minister of Justice in the Government of that Dominion; and

“The President of the United States of America: Charles Evans Hughes, Secretary of State of the United States;

“Who, after having communicated to each other their full powers, found in good and due form, have agreed as follows:—

ARTICLE 1

“In the present Convention, the term ‘level of Lake of the Woods’ or ‘level of the lake’ means the level of the open lake unaffected by wind or currents.

“The term ‘Lake of the Woods watershed’ means the entire region in which the waters discharged at the outlets of the Lake of the Woods have their natural source.

“The term ‘sea-level datum’ means the datum permanently established by the International Joint Commission at the town of Warroad, Minnesota, of which the description is as follows:—

“Top of copper plug in concrete block carried below frost line, and located near fence in front of and to the west of new schoolhouse. Established October 3, 1912. Elevation, sea-level datum, 1068.797.”

“The International Joint Commission” means the Commission established under the Treaty signed at Washington on the 11th day of January, 1909, between His Britannic Majesty and the United States of America, relating to boundary waters and questions arising between the United States and Canada.

ARTICLE 2

“The level of Lake of the Woods shall be regulated to the extent and in the manner provided for in the present Convention, with the object of securing to the inhabitants of Canada and the United States the most advantageous use of the waters thereof and of the waters flowing into and from the lake on

each side of the boundary between the two countries for domestic and sanitary purposes, for navigation purposes, for fishing purposes, and for power, irrigation and reclamation purposes.

ARTICLE 3

“The Government of Canada shall establish and maintain a Canadian Lake of the Woods Control Board, composed of engineers which shall regulate and control the outflow of the waters of Lake of the Woods.

“There shall be established and maintained an International Lake of the Woods Control Board composed of two engineers, one appointed by the Government of Canada and one by the Government of the United States from their respective public services, and whenever the level of the lake rises above elevation 1061 sea-level datum or falls below elevation 1056 sea-level datum the rate of total discharge of water from the lake shall be subject to the approval of this Board.

ARTICLE 4

“The level of Lake of the Woods shall ordinarily be maintained between elevation 1056 and 1061.25 sea-level datum, and between these two elevations the regulations shall be such as to ensure the highest continuous uniform discharge of water from the lake.

“During periods of excessive precipitation the total discharge of water from the lake shall, upon the level reaching elevation 1061 sea-level datum, be so regulated as to ensure that the extreme high level of the lake shall at no time exceed elevation 1062.5 sea-level datum.

“The level of the lake shall at no time be reduced below elevation 1056 sea-level datum except during periods of low precipitation and then only upon the approval of the International Lake of the Woods Control Board and subject to such conditions and limitations as may be necessary to protect the use of the waters of the lake for domestic, sanitary, navigation and fishing purposes.

ARTICLE 5

“If in the opinion of the International Lake of the Woods Control Board the experience gained in the regulation of the lake under Articles 3 and 4, or the provision of additional facilities for the storage of waters tributary to the lake, demonstrates that it is practicable to permit the upper limit of the ordinary range in the levels of the lake to be raised from elevation 1061.25 sea-level datum to a higher level and at the same time to prevent during periods of excessive precipitation the extreme high level of the lake from exceeding elevation 1062.5 sea-level datum, this shall be permitted under such conditions as the International Lake of the Woods Control Board may prescribe. Should such permission be granted, the level at which under Article 3 the rate of total discharge of water from the lake becomes subject to the approval of the International Lake of the Woods Control Board may, upon the recommendation of that Board and with the approval of the International Joint Commission, be raised from elevation 1061 sea-level datum to a correspondingly higher level.

ARTICLE 6

“Any disagreement between the members of the International Lake of the Woods Control Board as to the exercise of the functions of the Board under Articles 3, 4 and 5 shall be immediately referred by the Board to the International Joint Commission, whose decision shall be final.

ARTICLE 7

"The outflow capacity of the outlets of Lake of the Woods shall be so enlarged as to permit the discharge of not less than forty-seven thousand cubic feet of water per second (47,000 c.f.s.) when the level of the lake is at elevation 1061 sea-level datum.

"The necessary works for this purpose, as well as the necessary works and dams for controlling and regulating the outflow of the water, shall be provided for at the instance of the Government of Canada, either by the improvement of existing works and dams or by the construction of additional works.

ARTICLE 8

"A flowage easement shall be permitted up to elevation 1064 sea-level datum upon all lands bordering on Lake of the Woods in the United States, and the United States assumes all liability to the owners of such lands for the costs of such easement.

"The Government of the United States shall provide for the following protective works and measures in the United States along the shore of Lake of the Woods and the banks of Rainy river, in so far as such protective works and measures may be necessary for the purposes of the regulation of the level of the lake under the present convention; namely, the removal or protection of buildings injuriously affected by erosion, and the protection of the banks at the mouth of Warroad river where subject to erosion, in so far in both cases as the erosion results from fluctuations in the level of the lake; the alteration of the railway embankment east of the town of Warroad, Minnesota, in so far as it may be necessary to prevent surface flooding of the higher lands in and around the town of Warroad; the making of provision for the increased cost, if any, of operating the existing sewage system of the town of Warroad, and the protection of the waterfront at the town of Baudette, Minnesota.

ARTICLE 9

"The Dominion of Canada and the United States shall each on its own side of the boundary assume responsibility for any damage or injury which may have heretofore resulted to it or to its inhabitants from the fluctuations of the level of Lake of the Woods or of the outflow therefrom.

"Each shall likewise assume responsibility for any damage or injury which may hereafter result to it or to its inhabitants from the regulation of the level of Lake of the Woods in the manner provided for in the present Convention.

ARTICLE 10

"The Governments of Canada and the United States shall each be released from responsibility for any claims or expenses arising in the territory of the other in connection with the matters provided for in Articles 7, 8 and 9.

"In consideration, however, of the undertakings of the United States as set forth in Article 8, the Government of Canada shall pay to the Government of the United States the sum of two hundred and seventy-five thousand dollars (\$275,000) in currency of the United States. Should this sum prove insufficient to cover the cost of such undertakings one-half of the excess of such cost over the said sum shall, if the expenditure be incurred within five years of the coming into force of the present Convention, be paid by the Government of Canada.

ARTICLE 11

"No diversion shall henceforth be made of any waters from the Lake of the Woods watershed to any other watershed except by authority of the United States or the Dominion of Canada within their respective territories and with the approval of the International Joint Commission.

ARTICLE 12

"The present Convention shall be ratified in accordance with the constitutional methods of the High Contracting Parties and shall take effect on the exchange of the ratifications, which shall take place at Washington or Ottawa as soon as possible.

"In faith whereof the above-named plenipotentiaries have signed the present Convention and affixed their respective seals.

"Done in duplicate at Washington, the 24th day of February, 1925.

"(Seal) ERNEST LAPOINTE.

"(Seal) CHARLES EVANS HUGHES."

PROTOCOL ACCOMPANYING CONVENTION TO REGULATE THE
LEVEL OF THE LAKE OF THE WOODS

"At the moment of signing the Convention between His Majesty the King of the United Kingdom of Great Britain and Ireland and of the British Dominions beyond the Seas, Emperor of India, in respect of the Dominion of Canada, and the United States of America, regarding the regulation of the level of Lake of the Woods, the undersigned Plenipotentiaries have agreed as follows:—

1

"The plans of the necessary works for the enlargement of the outflow capacity of the outlets of Lake of the Woods provided for in Article 7 of the Convention, as well as of the necessary works and dams for controlling and regulating the outflow of the water, shall be referred to the International Lake of the Woods Control Board for an engineering report upon their suitability and sufficiency for the purpose of permitting the discharge of not less than forty-seven thousand cubic feet of water per second (47,000 c.f.s.) when the level of the lake is at elevation 1061 sea-level datum. Any disagreement between the members of the International Lake of the Woods Control Board in regard to the matters so referred shall be immediately submitted by the Board to the International Joint Commission whose decision shall be final.

2

"Should it become necessary to set up a special tribunal to determine the cost of the acquisition of the flowage easement in the United States provided for in Article 8 of the Convention, the Government of Canada shall be afforded an opportunity to be represented thereon. Should the cost be determined by means of the usual judicial procedure in the United States, the Government of Canada shall be given the privilege of representation by counsel in connection therewith.

3

"Since Canada is incurring extensive financial obligations in connection with the protective works and measures provided for in the United States along the shores of Lake of the Woods and the banks of Rainy river, under Article 8 of the Convention, the plans, together with the estimates of cost, of all such protective works and measures as the Government of the United States may propose to construct or provide for within five years of the coming into force of the Convention shall be referred to the International Lake of the Woods Control Board for an engineering report upon their suitability and sufficiency for the purpose of the regulation of the level of the lake under the Convention.

Any disagreement between the members of the International Lake of the Woods Control Board in regard to the matters so referred shall be immediately submitted by the Board to the International Joint Commission, whose decision shall be final.

4

“In order to ensure the fullest measure of co-operation between the International Lake of the Woods Control Board and the Canadian Lake of the Woods Control Board provided for in Article 3 of the Convention, the Government of Canada will appoint one member of the Canadian Board as its representative on the International Board.

5

“Until the outlets of Lake of the Woods have been enlarged in accordance with Article 7 of the Convention the upper limit of the ordinary range in the levels of the lake provided for in Article 4 of the Convention shall be elevation 1060·5 sea-level datum, and the International Lake of the Woods Control Board may advise the Canadian Lake of the Woods Control Board in respect of the rate of total discharge of water from the lake which may be permitted.

“In faith whereof the undersigned Plenipotentiaries have signed the present Protocol and affixed thereto their respective seals.

“Done in duplicate at Washington the 24th day of February, 1925.

“(Seal) ERNEST LAPOINTE.

“(Seal) CHARLES EVANS HUGHES.”

“At the moment of signing the Convention and Protocol between His Majesty the King of the United Kingdom of Great Britain and Ireland and of the British Dominions beyond the Seas, Emperor of India, in respect of the Dominion of Canada, and the United States of America regarding the regulation of the level of Lake of the Woods, the undersigned Plenipotentiaries have agreed that the Government of the Dominion of Canada and the Government of the United States shall, without delay, address to the International Joint Commission identic letters of reference relating to Rainy lake and other upper waters of the Lake of the Woods watershed as follows:—

“I have the honour to inform you that, in pursuance of Article 9 of the Treaty of the 11th January, 1909, between Great Britain and the United States, the Governments of Canada and the United States have agreed to refer to the International Joint Commission the following questions for examination and report, together with such conclusions and recommendations as may be deemed appropriate:—

“Question 1.—In order to secure the most advantageous use of the waters of Rainy lake and of the boundary waters flowing into and from Rainy lake, for domestic and sanitary purposes, for navigation purposes, for fishing purposes, and for power, irrigation and reclamation purposes; and in order to secure the most advantageous use of the shores and harbours of both Rainy lake and the boundary waters flowing into and from the lake, is it, from an economic standpoint, now practicable and desirable, having regard for all or any of the interests affected thereby, or under what conditions will it become thus practicable and desirable—

“(a) 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 elevation 1108·61 sea-level datum?

“(b) To regulate the level of Namakan lake and the waters controlled by the dams at Kettle falls in such a manner as to permit the upper limit of the ordinary range of the levels to exceed elevation 1120·11 sea-level datum?

“(c) To provide storage facilities upon all or any of the boundary waters above Namakan lake?

“Question 2.—If it be found practicable and desirable thus (1) to regulate the level of Rainy lake, and/or (2) to regulate the level of Namakan lake and the waters controlled by the dams at Kettle falls, and/or (3) to provide storage facilities upon all or any of the boundary waters above Namakan lake—

“(a) What elevations are recommended?

“(b) To what extent will it be necessary to acquire lands and to construct works in order to provide for such elevations and/or storage, and what will be their respective costs?

“(c) What interests on each side of the boundary would be benefited? What would be the nature and extent of such benefit in each case? How should the cost be apportioned among the various interests so benefited?

“Question 3.—What methods of control and operation would be feasible and advisable in order to regulate the volume, use and outflow of the waters in each case in accordance with such recommendations as may be made in answer to questions 1 and 2?

“Question 4.—What interests on each side of the boundary are benefited by the present storage on Rainy lake and on the waters controlled by the dams at Kettle falls? What are the nature and extent of such benefits in each case? What is the cost of such storage and how should such cost be apportioned among the various interests so benefited?

“Each Government will appoint from its public service such engineering and other technical assistance as may be necessary to enable the Commission to make the desired examination and to submit their report.”

“In witness whereof the undersigned have signed this Agreement at Washington this 24th day of February, 1925.

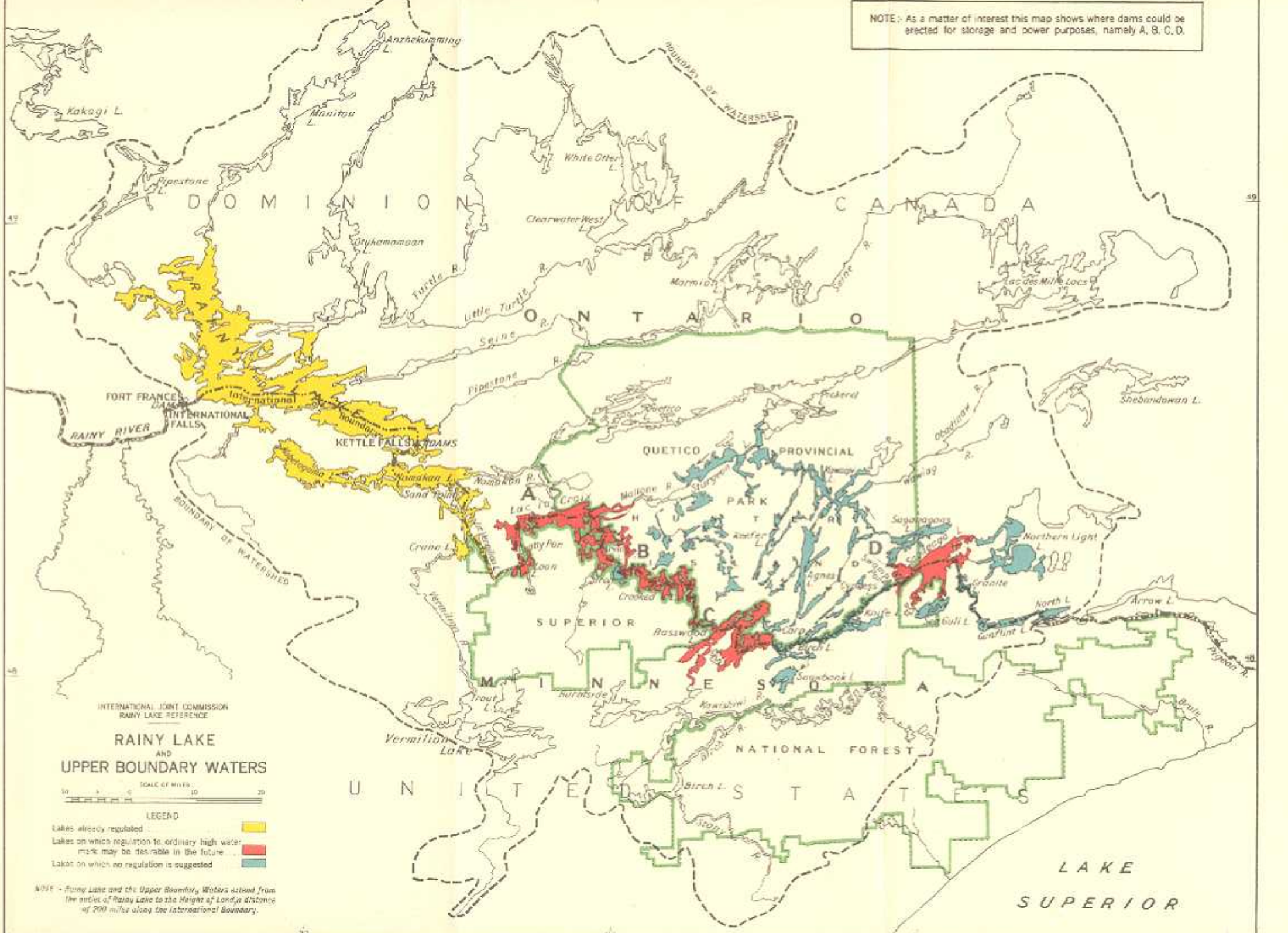
ERNEST LAPOINTE,

*Minister of Justice in the Government
of the Dominion of Canada.*

CHARLES EVANS HUGHES,

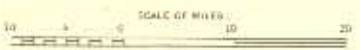
*Secretary of State of the United
States of America.”*

NOTE: As a matter of interest this map shows where dams could be erected for storage and power purposes, namely A, B, C, D.



INTERNATIONAL JOINT COMMISSION
RAINY LAKE REFERENCE

RAINY LAKE AND UPPER BOUNDARY WATERS



- LEGEND
- Lakes already regulated ■
 - Lakes on which regulation to ordinary high water mark may be desirable in the future ■
 - Lakes on which no regulation is suggested ■

NOTE - Rainy Lake and the Upper Boundary Waters extend from the outlet of Rainy Lake to the Height of Land, a distance of 200 miles along the International Boundary.

LAKE
SUPERIOR