

hand will be found very meagre and the conservation scheme will have to be designed in a more or less haphazard manner.

With federal co-operation, the system now practised in Ontario could probably be continued and extended to comprise other streams and establish new stations more rapidly.

In Quebec and the Maritime provinces, much data on this subject could no doubt, first of all, be collected from private parties or large hydraulic plants where records of river heights have been kept, and a system similar to that of Ontario or a modification to suit local conditions could be started at once and the returns from the different stations throughout Canada sent to their provincial authorities as well as to Ottawa, where they could be tabulated in a uniform manner and printed for easy access to the public.

Other countries with less water-power possibilities than Canada have devoted a great deal of attention to systematic observation of stream flow, namely: Italy, Switzerland, Bavaria, France and other European countries. In the United States, the Geological Survey has, for years, devoted a great deal of attention to the subject of stream measurement and has developed an excellent system, both of carrying out the work in the field and of reporting and tabulating the data obtained.

In Canada, one of the greatest difficulties to be overcome in connection with this work is the taking of observations during the winter season, as practically all our streams are then frozen over. These difficulties, however, can be overcome and they are always more than balanced by the importance of obtaining complete and reliable data during the very time when the rivers are in this condition.

In a report on "Stream Flow during the Frozen Season," Messrs. H. K. Barrows and R. E. Horton of the U.S. Geological Survey say in part—"There is not even an approximate relation between the snow-fall and the stream flow, so that the failure to obtain winter records of flow at a gauging station means a considerable percentage of uncertainty as to the total run-off as well as its distribution. In the Northern states droughts are apt to occur in the late summer or fall and during the winter. At times this condition of drought may be nearly or quite continuous between these two periods, with its culmination in January or February. If there is no melting of snow during the winter, the inflow to streams that freeze is chiefly derived from springs, ground water, and lake storage and in a long, cold winter, especially if it succeeds a period of low water, the minimum flow for the year may be reached and continue for some time. Estimates of flow, therefore, to be of conclusive value on streams utilized for water-power, must embrace these winter periods of low water."

It is needless to add that the winter conditions which occur in Northern United States rivers are found even in a more marked degree in Canadian rivers, and it follows that the statement just quoted applies with a proportionately greater force to Canada.

Summing up, the Committee on Conservation is of the opinion that, while the work recommended by Mr. Sauder, viz., topographical and hydrographical surveys to determine the situation and quantity of water supply, should be undertaken by the Dominion Government, and is of great importance, it is probable that the Government is, at the present time, carrying on more extensive and detailed investigations of this nature than is generally appreciated. That, while a certain amount of concentration to avoid duplication and overlapping of work is necessary, the scale upon which the work has been initiated indicates that the needs of the country in this respect will be met.

That the work already done is of great value but that much of it is not, in its present form, available to the engineers and

That steps should be taken to secure such publication and distribution of this information as will bring it within the reach of each and every engineer in Canada.

#### COMMITTEE—

James White, Chairman.  
H. F. Laurence.  
R. McColl.  
R. O. Sweezey.  
W. H. Breithaupt.  
G. A. Bayne.  
A. J. MacPherson.  
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John Chalmers.  
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JAMES WHITE  
Chairman

## REPORT ON THE VISIT OF MEMBERS OF THE INTERNATIONAL CONGRESS OF NAVIGATION TO CANADA IN JUNE, 1912.

On March 6th, 1912, Col. W. P. Anderson, Chief Engineer of the Department of Marine and Fisheries, acting for the Department, addressed the Council of the Society to the effect that the members of the International Congress of Navigation had been invited by the Canadian Government to visit Canada on the conclusion of the sessions of the Congress to be held in Philadelphia in May, 1912. Col. Anderson intimated that the Dominion Government had voted \$20,000 to provide for the expenses of the delegates and that of this sum \$5,000 would be required for the necessary official publications, the remaining \$15,000 being available for transportation and incidental charges. He also stated that Major G. W. Stephens, Chairman of the Montreal Harbour Commission, who had been officially nominated by the Government to represent Canada at the Congress, had recommended that the Canadian Society of Civil Engineers should be invited to organize the proposed visit to Canada, and asked if the Council would be willing to undertake the work of outlining a programme and make the necessary arrangements for carrying out the excursion.

At a meeting held on March 9th the Council acquiesced in the proposal and appointed a Committee consisting of Messrs. H. Holgate and H. H. Vaughan, Vice-Presidents of the Society; Mr. Ernest Marceau, Past President; Messrs. C. N. Monsarrat, J. N. Shanly, W. J. Stewart and P. E. Parent, Members of Council; Mr. A. St. Laurent, Department of Public Works, Ottawa; and Professor C. H. McLeod, Secretary of the Society, to confer with Major Stephens and report. This Committee met Major Stephens, and as a result of various conferences with him and with the Department of Marine and Fisheries through Col. Anderson, the following programme was outlined and received the approval of the Council of the Society and of the Department of Marine and Fisheries on behalf of the Government of Canada. It was understood that the Society, represented by its Council and special Committee, would act for the Government in receiving the foreign guests and conducting them to the various places named and works of engineering and commercial interest of the Dominion. It was further arranged that in addition to the central Committee of the Council above mentioned, the Society's Branches at Toronto and Ottawa should be asked to formulate the programmes in these cities and be responsible for the completion of the same. In Ottawa the departmental officials were to take in hand, especially, the organization of the banquet to be tendered to the delegates by the Dominion Cabinet.

#### CANADIAN EXCURSION

June 12th P.M.—Leave Sault Ste. Marie.

June 13th A.M.—Arrive Port McNicoll.

The terminal facilities of this Port will be inspected and a special train will convey the party to Toronto.

P.M.—Arrive Toronto.

The afternoon will be spent in sight-seeing.

June 14th A.M.—A short excursion on the Lake and Harbour.

The Toronto programme will be in charge of a local Committee of the Toronto Branch of the Canadian Society of Civil Engineers.

P.M.—Leave Toronto (by steamer).

June 15th A.M.—Arrive Prescott.

Before reaching Prescott (about 10 A.M.) the Thousand Islands of the St. Lawrence River will have been passed through.

A.M.—Leave Prescott.

P.M.—Arrive Ottawa.

The arrangements at Ottawa will be in charge of a Committee of the Ottawa Branch of the Canadian Society of Civil Engineers. A very interesting programme has been prepared, including a banquet to the gentlemen of the party by the Dominion Cabinet, and some special entertainment for the ladies.