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# POLLUTION OF BOUNDARY WATERS

ENGINEERING INVESTIGATIONS SHOW THAT EXTENSIVE SEWAGE TREATMENT IS REQUIRED ONLY IN THE BUFFALO AND DETROIT DISTRICTS—COARSE SCREENING WILL SUFFICE FOR MOST OTHER BOUNDARY RIVERS.

PROF. EARLE BERNARD PHELPS, consulting sanitary engineer to the International Joint Commission,\* has made a report, consisting of 159 large pages and 67 plates, upon remedial measures for the present conditions of pollution of boundary waters between Canada and the United States.

After extensive field work, the Commission issued a progress report, early in 1914, indicating to what extent and by what causes and in what localities the boundary waters have been polluted so as to be injurious to public health. A board of three Canadian and three United States sanitary engineers then compiled fourteen principles which, in their opinion, should guide the commission in its further studies.

Under direction of Prof. Phelps investigations were then undertaken in order to secure data upon which to base a report upon the following question:—

prevent the pollution of these waters, on either side, to the injury of health or property on the other?

The answer just made is not final. Public hearings will be held at Buffalo June 21st, 1916, and at Detroit June 26th, 1916, at which all interested authorities will have opportunity to present evidence and criticisms. The final conclusions of the commission will probably be based upon its engineers' reports and the evidence produced at the hearings. The following abstracts have been taken from the advance proofs of Prof. Phelps' report:—

## Advisability of Remedial Measures.

Satisfactory recommendations upon the advisability of remedial measures must be based on the one hand, upon the results of a thorough examination of existing conditions of pollution; upon the feasibility and cost of remedying these conditions wholly or in part; and upon a careful

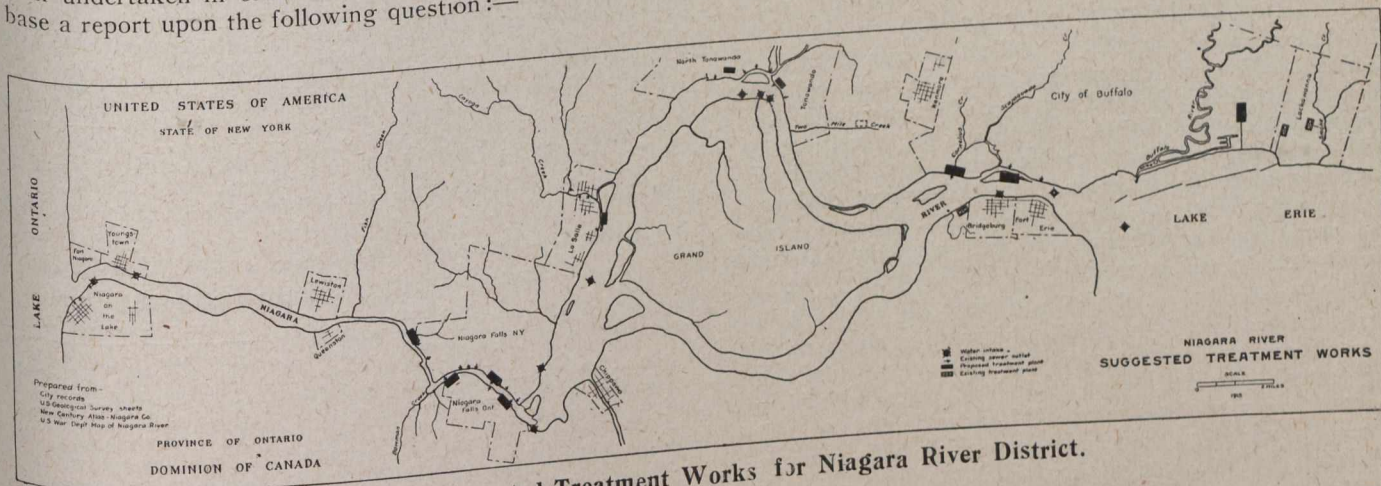


Fig. 1.—Suggested Treatment Works for Niagara River District.

In what way or manner, whether by the construction and operation of suitable drainage canals or plants at convenient points or otherwise, is it possible and advisable to remedy or prevent the pollution of these waters, and by what means or arrangement can the proper construction or operation of remedial or preventive works, or a system or method of rendering these waters sanitary and suitable for domestic and other uses be best secured and maintained in order to insure the adequate protection and development of all interests involved on both sides of the boundary, and to fulfil the obligations undertaken in Article IV. of the waterways treaty of January 11, 1909, between the United States and Great Britain, in which it is agreed that the waters therein defined as boundary waters and waters flowing across the boundary shall not be polluted on either side to the injury of health or property on the other?

Stripped of its explanatory matter the reference becomes:

In what way is it possible and advisable to remedy or

\*Members of the Commission are:—Canada, Charles A. Magrath, chairman; Henry A. Powell, K.C.; P. B. Mignault, K.C. United States, Obadiah Gardner, chairman; James A. Tawney; R. B. Glenn. Organized in 1912, by treaty, as a court of arbitration to settle all questions regarding boundary waters and other similar frontier matters.

comparison of the relative value and cost of the benefits to be derived thereby. On the other hand, such an inquiry must be guided in the present reference by the terms of the treaty that the boundary waters "shall not be polluted on either side to the injury of health or property on the other."

It is understood that the advisability of this requirement itself is not in question and that it would be without the scope of the present reference to consider the merits of alternative projects, such as new sources of water supply for the lower communities, which would not accomplish this specific requirement.

It will be necessary, therefore, in this discussion of the advisability of remedies, to review the results already obtained and reported upon by the commission, relative to existing pollution of these waters, and to examine these results with special reference to the nature and extent of any injury to health or property which may be attributed to pollution crossing the boundary.

Such a review involves the interpretation of bacteriological results in terms of injury and necessitates in turn a discussion of reasonable and permissible limits of pollution, the extent and character of pollution from natural drainage, the efficacy of water purification plants, and the effect upon the safe operation of such plants of increasing