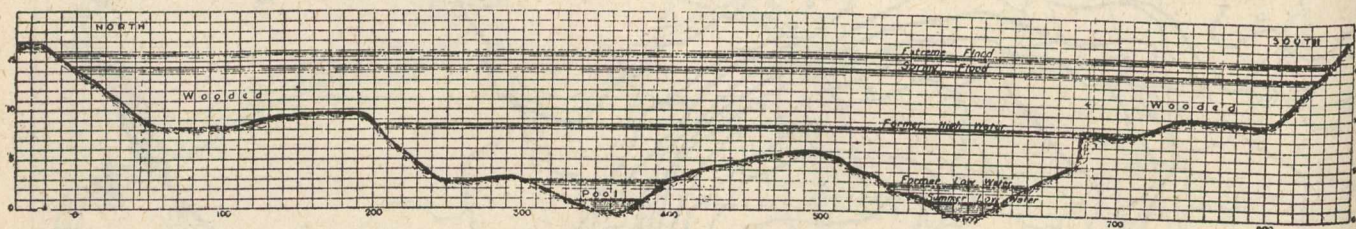


(Continued from Page 259.)

Besides the prevention of disastrous floods the questions of pure water supply for cities and towns, and of power generation along the various rivers with their very considerable fall emphasize the importance of regulation of flow.

The Grand River rises in Melancthon Township, within the 1,700 ft. contour and empties into Lake Erie near its outlet. Its total fall is about 1,100 ft. Its tributaries in their order from upstreams are the Conestogo, the Speed, Eramosa, and the Nith. It has a total drainage area of about 2,600 square miles, about 1,325 square miles above Galt, below the



outlet of the Speed, and about 450 square miles above Elora. After leaving the plateau the greater part of the fall is in the upper third of the river's length. Its spring floods have very greatly increased especially during the last thirty to thirty-five years coincident with the clearing and drainage of the head water swamp areas, while its minimum flow which formerly sustained large water powers at many places along its course is now of little or no power value. Fig. 1 shows a typical cross-section of the river. The flow in the dry season is now only about 80 cubic feet per second, a small fraction of former low water, while at flood the river overflows the well-marked old channel and covers the wooded banks on which are some trees of only 35 to 40 years' growth, indicating the period of beginning of excessive floods. Were the precipitation from one-quarter or even one-fifth the drainage area husbanded the minimum flow could be increased four-fold or more and flood crests obviated. The discharge of the Grand River at a point above the outlet of the Speed is now only 80 to 100 feet per second at low water, and 10,000 to 20,000 cubic feet per second at flood. Considering a minimum of 30 inches of precipitation per annum on 400 square miles of surface, say at the head drainage area, and a minimum run-off of 40 per cent., the annual stream discharge would be 11,151,360,000 cubic feet, sufficient to give a flow of nearly 400 cubic feet per second throughout the year. But the precipitation from a much larger area than 400 square miles could be husbanded. Above the 1,000 feet contour there are several good sites for storage basins on a large scale. A storage capacity of 10 square miles 10 feet deep seems to be readily practicable. This would mean 2,787,840,000 cubic feet, ample provision for regulation, and for generation of power to the extent of 8,000 to 10,000 horse-power. This capacity would also suffice for storage for 3 days of a flow at the rate of 10,000 cubic feet per second, and would thus give effective flood regulation continuously between Galt and Elora alone. The great water-power gain could almost be considered as a by-product in view of flood regulation, good water supply, and other economic advantages obtained. In fertility of soil and in other advantages the Grand River basin is fitted to support a large population. It already has a number of large manufacturing centres.

Reforestation and particularly restoration of the swamp areas of the headwater townships, and provision of large storage basins should both be carried out; each measure complements the other, and they cannot be too strongly recommended.

The first requisite is a definite knowledge of the topography. This is now known only from the few railway elevations and from the broadly general features. A full topographical survey, definite gaugings, examinations of sites for storage basins, and delimitation of especially the head drainage area should be no longer delayed.

Precipitation gaugings, rainfall and snowfall, throughout the Province are also urgently required. Definite records have been kept, but only in a few places in Ontario, for about 65 years. A feature of one series of records is that in 50

years there have been 29 rainfalls of over 2 inches in 24 hours, some as high as 3½ inches in 24 hours. Otherwise there are only uncertain records, many of them volunteer work, and much of this has been discontinued. A small appropriation, would enable the accurate keeping of such records at all High Schools in Ontario, and the work would be an admirable incentive to physical to physical study and research.

In view of the fact that south-western Ontario is destined to be the manufacturing centre and the most densely populated section of the Dominion, the conservation and development of its natural resources, among which the one herein

outlined is in the first rank, is of preponderant importance. Sooner or later the work of limited reforestation and river regulation must inevitably be undertaken. Delay will but make it greater.

## ENGINEERING SOCIETIES.

CANADIAN RAILWAY CLUB.—President, W. D. Robb, G.T.R.; secretary, James Powell, P.O. Box 7, St. Lambert, near Montreal, P.Q.

CANADIAN STREET RAILWAY ASSOCIATION.—President, E. A. Evans, Quebec; secretary, Acton Burrows, 157 Bay Street, Toronto.

CANADIAN INDEPENDENT TELEPHONE ASSOCIATION.—President, J. F. Demers, M.D., Levis, Que.; secretary, F. Page Wilson, Toronto.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—413 Dorchester Street West, Montreal. President, J. Galbraith; Secretary, Prof. C. H. McLeod. Meetings will be held at Society Rooms each Thursday until May 1st, 1908.

QUEBEC BRANCH OF THE CANADIAN SOCIETY OF CIVIL ENGINEERS.—Chairman, E. A. Hoare; Secretary, P. E. Parent, P.O. Box 115, Quebec. Meetings held twice a month at Room 40, City Hall.

TORONTO BRANCH OF THE CANADIAN SOCIETY OF CIVIL ENGINEERS.—96 King Street West, Toronto. Chairman, C. H. Mitchell; Secretary, T. C. Irving, Jr. Traders Bank Building.

WINNIPEG BRANCH OF THE CANADIAN SOCIETY OF CIVIL ENGINEERS.—Chairman, H. N. Ruttan; Secretary, E. Brydone Jack. Meets first and third Friday of each month, October to April, in University of Manitoba.

ENGINEERS' CLUB OF TORONTO.—96 King Street West. President, J. G. Sing; secretary, R. B. Wolsey. Meeting every Thursday evening during the fall and winter months; April 9th, 1908, Canadian Forestry Problems.

CANADIAN ELECTRICAL ASSOCIATION.—President, R. S. Kelsch, Montreal; secretary, T. S. Young, Canadian Electrical News, Toronto.

CANADIAN MINING INSTITUTE.—413 Dorchester Street West, Montreal. President, W. G. Miller, Toronto; secretary, H. Mortimer-Lamb, Montreal.

NOVA SCOTIA SOCIETY OF ENGINEERS, HALIFAX.—President, R. McColl; Secretary, S. Fenn, Bedford Row, Halifax, N.S.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, TORONTO BRANCH.—W. G. Chace, Secretary, Confederation Life Building, Toronto.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—29 West 39th Street, New York. President, H. L. Holman; secretary, Calvin W. Rice.