

Temiskaming and Carillon. This aggregate capacity will be capable of commercial development only in the event of the river being canalized, and will depend furthermore upon the creation of a market for power vastly in excess of that now existing.

Power development on the Ottawa River, in Ontario, is at present almost wholly confined to the large industries which operate at the Chaudiere Falls, and under average conditions about 36,000 h.p. is now in use. Of this amount about 17,000 h.p. is used in the mills of J. R. Booth, 5,000 h.p. by the Ottawa Power Company, 9,000 h.p. by the Ottawa Electric Company, and the balance by the city waterworks and the street railway.

With complete flow regulation it is anticipated that the minimum capacity of the Chaudiere will be 84,000 h.p. or about 25,000 h.p. in excess of the amount now developed on both sides of the river. The very considerable industrial prominence which the city of Ottawa has attained, through the development of power at the Chaudiere, will thus be further enhanced by the future development of the surplus capacity provided by regulation.

Rivers Tributary to the Great Lakes.—From an economic standpoint the rivers tributary to the Great Lakes are now, and will probably continue to be, the most important of the rivers lying wholly within the boundaries of the province. This is due to the fact that they produce motive power, either direct or through the medium of electric transmission, for a great variety of industries, many of which are large users of labor and consequently contribute greatly to the population and general prosperity of the province.

Of the rivers flowing into Lake Ontario, the Trent is the most important. On this river and its main tributaries there is about 75,000 h.p. capable of more or less easy development by reason of the works of the Trent Canal, which are now nearing completion. Of this total quantity about 45,000 h.p. is now developed between Trenton and Balsam Lake, which is the summit level of the canal.

The most important developments are those of the Electric Power Company, which company has seven plants in operation, with a rated capacity of 33,300 h.p. installed. Through the medium of about 300 miles of 44,000-volt transmission line the company supply power to a large territory, extending along the lake front from Whitby to Napanee and as far north as Madoc and Lindsay. It has also, by the wholesale acquisition of local hydraulic, steam and gas plants, obtained complete control of the light and power business in the territory served by its transmission lines.

From the above figures it appears that the undeveloped hydraulic resources of the Trent system amount to almost 30,000 h.p. The importance of these undeveloped resources is largely due to the fact that they are capable of cheap and easy utilization through the existence of the locks and dams of the Trent Canal, which concentrate all of the natural head between Trenton and Balsam Lake. In addition to this the large lake areas of the Trent basin are controlled by the Dominion Government, largely with a view to improvement of flow conditions for power purposes. The regimen of the river had previously been seriously affected by deforestation, but flow conditions have already been materially improved, and still better results are to be anticipated through the further extension of the storage system, and the development of an efficient scheme of control.

The existing market requirements of the district are now fairly met by the existing developments, but the undeveloped water powers of the Trent System, having capacities ranging from 1,000 to 10,000 h.p., offer fine opportunities for the establishment of new industries, especially in the vicinity of Peterborough, Campbellford and Trenton.

At the present time the canal water powers are developed under a form of lease issued by the Department of Railways and Canals. Latterly these leases have called for a rental of \$2 per horse-power per annum for every horse-power developed.

The Grand River is the largest of the Lake Erie tributaries, and the possession of 2,500 square miles of drainage area should properly class it among the more important rivers of the province from a power standpoint. At the time of Confederation, and for some years thereafter, the Grand River supplied all the water used for power and navigation purposes on the Welland Canal. Since that time there has been developed in the Grand River basin one of the greatest agricultural districts in Canada, and an urban population supported by industries of national importance. The combined effects of deforestation, drainage and extensive cultivation, which attended this industrial growth, have transformed the Grand River into a destructive torrential stream, and largely destroyed its usefulness as a source of power.

Through similar causes, the Thames, the Maitland, and most of the smaller streams in the south-western peninsula also suffer seriously from lack of natural control. An investigation is now being carried on by the Hydro-Electric Power Commission with a view to determining some feasible method of improving the regimen of these rivers, but for the time being, at any rate, they must be regarded only as sources of intermittent power for purely local purposes.

The rivers flowing into Lake Huron possess varying characteristics as regards regimen, ranging from the Maitland, with its natural flow characteristics almost completely destroyed, and the Saugeen, which still retains in a certain degree its natural regimen, to the Laurentian rivers of the north shore, flowing from unsettled and forested basins.

The contrasted characteristics of these, Lake Huron rivers illustrates in a most emphatic manner the effect of agricultural development on stream-flow. The Maitland basin has an area of about 950 square miles, almost entirely deforested and very highly cultivated. The measured minimum run-off of this river is to its measured maximum run-off as 900 to 1. The Wahnapiatae River on the north shore has practically the same area as the Maitland. The basin of this river is largely in virgin forest, and second growth, and practically unsettled. Its maximum run-off is to its minimum run-off about as 10 to 1, against 900 to 1 for the Maitland. Also its minimum run-off per square mile of drainage basin is about 13 times that of the Maitland. It is only fair to state that the regimen of the Wahnapiatae is considerably influenced by natural lake storage, which the Maitland River lacks entirely, but even after giving due weight to this fact the contrast is startling.

From a hydraulic standpoint, the most important of the Lake Huron tributaries are the Mississauga, the Spanish, the Sturgeon, the French, the Maganetwan, the Muskoka, the Severn, the Saugeen and the Beaver.

The total low-water capacity of all the Lake Huron tributaries is about 166,000 h.p., this figure being rea-