

Lake Superior to Montreal, in which there is a fall of 546 feet, is not included, being below the level of the tributaries.

We have measurements of the flow in both the St. Lawrence and the Ottawa in cubic feet per second, as follows:

	c. ft. per sec.
In St. Mary's river, outlet of Lake Superior.....	80,000
In St. Clair river, outlet of Lake Huron.....	225,000
In Niagara river, above the falls.....	265,000
In St. Lawrence river above the rapids.....	300,000
In Ottawa river, above Lake of Two Mountains.....	35,000

Canada's share of the St. Lawrence water power from Lake Superior to Montreal would be about ten million horse power.

Canada has half the water of the St. Lawrence from Lake Superior to Cornwall, and all of it between Lake St. Francis and Montreal; but only a portion of this half could be utilized,—and this would apply more or less to the Ottawa and other rivers, where all the power could not be utilized without an expenditure probably beyond its value.

The power at Niagara has been estimated at seven million horse power, from less than half of the fall between Lakes Erie and Ontario, but the flow of the Niagara River, as given above, does not support so high an estimate. The whole of this fall (over 320 feet) can be utilized on the Welland Canal, but the quantity is comparatively insignificant, from the limited channel and necessarily low velocity of the current in it.

In like manner the whole fall upon our canals in the St. Lawrence can be utilized subject to the limitations imposed by the requirements of navigation. Because these canals have not had the work for which they were intended, they have in some cases become mill races rather than slack water channels. This has been the less felt, hitherto, on account of the lightness of their west bound traffic, the strong current toward the mills being in favor of the deeper laden east bound craft, thus incidentally compensating for a violation of canal maxims.

While water power was at first the only substitute for the windmill in new countries, and its economy as well as superiority has always been recognized, several causes have contributed to limit its more general application. Before the invention of the turbine in the first half of the present century heads exceeding about seventy feet could not be utilized on account of the comparative weakness and excessive cost of wheels of large diameter. In these days of structural steel, and "Ferris" wheels, this difficulty could be overcome; but, with the turbine, the conditions are reversed, the higher the head the less the size and cost of wheels, so that the most valuable water powers were the most cheaply utilized in this respect.