tidal influence to any considerable extent, except in detached sections; while the former are navigable for thousands of miles and are therefore without water power. Those great western rivers flow upon a nearly uniform grade of a few inches per mile, whilst the St. Lawrence and its tributaries are interrupted by rapids, chutes and cataracts, affording a great variety, quantity and quality of water power.

In the United States, between the Atlantic coast and the Rocky Mountains, as far south as the Gulf of Mexico and as far north as the Dakotas (with the exception of part of New York and New England), there is an entire absence of lakes; while throughout Canada, north of the St. Lawrence and stretching north-west toward the Mackenzie river basin, these are innumerable, in fact have never been numbered, and thousands of the smaller ones have never been represented on any map. The upper sections or sources of most of the Canadian rivers are chains of lakes, occupying in many instances the greater portion of the water course. These head waters are often upon nearly the same elevation and interlocked with the sources of other rivers flowing in opposite or different directions, and separated by narrow necks of land at a low divide, rendering diversion from one to another possible, a feature which has in some places been utilized by lumbermen—fearless of any legal injunction. This terrace-like profile of the rivers and their frequent expansion into lakes, often dotted with islands, not only enhances the beauty of the scenery, but, for utilitarian purposes, constitutes a series of elevated natural mill ponds, containing latent power of unknown extent and value, awaiting that demand upon them which is now being made in consequence of the discovery that our second-rate forest growth which has hitherto served chiefly to ornament their shores and islands has become the most important, and can be ground into pulp and rolled into paper to meet the ever-increasing demands of the newspaper, the bookmaker, and the innumerable forms into which wood pulp can be compressed for useful or ornamental purposes—or as a substitute for wood or metal. These steps from high to lower levels in every rivulet, branch, tributary or main stream of nearly every one of our northern rivers produce more or less broken water which never freezes over but remains open during the coldest weather, giving an alteration of closed and open water sections, of ice-covered lakes and of broken water in rapids, which may cover miles in extent, as well as at chutes or cataracts with more or less open water above and below them.

It is an interesting question for specialists to determine what effect, if any, this often large percentage and almost general distribution of open water during the coldest weather (of which every stream large or small has a portion), may have in modifying the extremes of temperature in these northern latitudes. When all the ground is frozen solid and covered with a deep mantle of snow, extending over the lakes and checking increasing thickness of their ice covering, large bodies of water are impounded and maintained at a temperature above the freezing point, although there may be fifty degrees of frost in the air, and are constantly poured forth into this frigid atmosphere. It is conceded that our Great Lakes modify the temperature of their border lands, and although these open water spaces in our northern rivers may be inferior in surface, they exist on every river having rapids or falls, and extend over such a vast field that their aggregate area must be very large. Unlike the Great Lakes these open spaces are constantly receiving fresh supplies of warmer water to temper the severity of the air. Such "breathing holes" (as they are sometimes called), are necessarily comparatively shallow, and are the only places, after all other water is frozen over, where "anchored" ice is formed and found. This differs from the lake ice in that the latter melts where it freezes, while anchor ice, when compelled by milder weather to let go its hold upon the bottom, rises, and is immediately drawn under the fixed ice below, and does not dissolve until the river breaks up in the spring. The latent heat of water disengaged in freezing—which process occurs so frequently during the five months of winter—is imparted to the atmosphere, but is not again absorbed by melting ice, as would be the case in lakes, or in deep, sluggish rivers. Again radiation is supposed to play an important part in "anchoring" the floating particles of ice to the river bottom, which is said to be cooled so rapidly by the ice-laden current above it as to become frozen, and then begin to attract the passing ice needles, and fix them to its bed. If mother earth, in mid-winter, contributes any of her impounded heat to the outer atmosphere, these almost innumerable unfrozen spaces certainly offer great facilities for giving vent to her suppressed emotions.

From the Straits of Belle Isle to Montreal, and thence ascending the Ottawa, the tributaries of the St. Lawrence and of the Ottawa descend, through the Laurentian region, from elevations of 1,800 to 1,000 feet above tide, and debouche within a few miles of each other, except immediately about the Saguenay. In many cases they bring their principal cataracts very near their outfall, notably in the case of the famous Falls of Montmorency, which, leaping directly into the St. Lawrence from a height of 250 feet, are utilized to light the streets and drive the tram cars of Quebec. Somewhat similar conditions exist on the south shore of the St. Lawrence until the Richelieu river (the outlet of Lake Champlain), is reached, where at Chambly, water power is about to be used to send the electric current into Montreal, in competition with steam, and with a similar water power from the Lachine Rapids. The divide between the St. Lawrence and the Ottawa is studded with lakes west of the Rideau Canal, a principal outlet for which—on the south—is the river Trent discharging into the Bay of Quinte, with large mills and much undeveloped water power at its mouth; and on the north, some half a dozen important tributaries discharging into the Ottawa. At Sault Ste. Marie, a water power canal fed from Lake Superior supplies the largest pulp mill yet erected in Ontario and a similar work at the Lake of the Woods (which lake is 1,000 feet above tide), gives power to the largest flour mill in the Dominion. The waters of the Winnipeg river (the outlet of the Lake of the Woods), descend about 300 feet, unused, into Winnipeg Lake, adjoining Lake Manitoba, from whence the water system extends to the Saskatchewan, and thence via Athabasca, the Great Slave, and the Great Bear lakes, to the Arctic circle.

No reference has been made to the long established