

Our progress into the interior of the continent made itself apparent by an increase in warmth—August 8th brought great heat, all the more unendurable because a few days before we had been fairly frozen among the icebergs. In the winter, however, it becomes bitterly cold; every year the St. Lawrence freezes, and that so hard that they can carry the railway over it at Montreal. Still I could not discover any effect of the moving ice upon the form of the river bed, or upon the transport of boulders. The river bed has the same form as that of streams which have but little ice, and the accumulation of boulders on the shore is confined to places where the clay has been washed down. Near Lotbinière only, it rushes along between heaps of boulders, and evidently it here traverses a mass heaped up in its bed during the ice age.

At midday on August 9th I landed in Montreal after a journey by steamship of 5146 kilometers. I was strongly tempted to stay in the neighbourhood of this city, where a boss of eruptive rock breaks through the superincumbent Silurian strata to form Mount Royal, which again bears glacial marine deposits almost to its summit. But, it seemed to me more important to go on at once to Detroit in order to meet the American investigators. Thither I hastened, merely making a short stop in the capital of Canada for the purpose of viewing the collections of the Geological Survey of Canada. I had then for the first time the pleasure of meeting with its director, Dr. Geo. M. Dawson, who afterwards guided the great excursion across the continent.

In Detroit the opportunity, for which I had been secretly longing, arrived, that is to make an excursion under approved guidance to the shores of the great North American lakes. These waters are of sea-like dimensions, on their shores the waves wash down cliffs as on the coasts of the oceans and cast up beaches, while the current along the coast forms spits and sandbars. All these phenomena have been excellently described by Gilbert, and it was a matter of great importance to me to see them as well as a number of other phenomena. Above the present shore line, for instance, there extend others belonging to an earlier period of higher water levels. The investigations of Gilbert, Spencer and Taylor have shown that they are not parallel with the present water line, but have a regular ascent towards the northeast. This fact is theoretically of great importance, for it leaves but one deduction possible, that of a general rise of the land which was stronger in the northeast than in the southwest. Therefore American scientists speak quite confidently of great elevations of the land, of a warping, a bending of the earth's crust, while Ed. Suess in Europe gave quite another significance to the phenomena on the Scandinavian coast, and being dubious as to any general rising of the land referred them to a movement of the surface of the sea.

To my great good fortune Grove Karl Gilbert himself met my wishes and conducted me around the phenomena which he discovered and described. After attending the meeting of the A. A. A. S. on August 10th to 12th, and visiting some sunken valleys near Detroit under Taylor's guidance, I found myself on the 13th in Buffalo, where I was to meet Gilbert. We first visited the counties on the south shore of Lake Ontario in New York State, where, like the fingers of a hand a number of long narrow lakes lie between pleasant shores, then we travelled to the western extremity of Lake Ontario in order to proceed along its northern bank to Toronto.

At the very start our journey afforded us an interesting phenomenon. A long sandbar entirely separates the western end of Lake Ontario from the lake itself, so that a wide bay stretches along beside the inland sea. On this is situated the flourishing city of Hamilton, built upon a terrace which evidently represents an old lake shore. From this terrace a broad dike, thirty-four meters high, and scarcely forty meters wide on top, extends like a railway embankment towards the north, separating marshland from the bay already mentioned. It has been cut through in the middle, and one can see that it consists of coarse gravel resting on fine sand, underneath which lies clay. It is a recent accumulation that we have here. The inhabitants of Hamilton have no doubt as to its origin. They regard the dike rightly as the sand bank of a Lake Ontario which stood thirty-four meters higher and which created also the present site of their city. Beside this older sandbank runs a recent one that converts the west end of the lake into a great bay. From here on we followed without interruption the old shore line—Gilbert's Iroquois