

a mile and a half wide, enlarging southward to its junction with the Mississippi valley; and, in contrast, the valley of the Mississippi north of this junction is small. He thus obtained positive evidence that the valley and river from Winnipeg southward was not long since one, and that the continental level was then such as would give the southward flow to the waters. To reproduce now this slope would require a rise of the Winnipeg region (or a sinking of the divide) amounting to about 260 feet; and to give the waters also a pitch of half a foot a mile, an additional 165 feet. The former existence of this greater Mississippi is also shown by the fact that fresh-water shells of the Winnipeg region also live in the Mississippi.

Warren also suggested that Lake Michigan at the same time, owing to the same northern uplift, discharged by the Illinois River into the Mississippi—its broad and deep valley widening in the vicinity of the lake in accordance with this direction of flow.

The changes about all the Great Lakes were such as tended to give them probably independent outlets. The channels that now unite them are all shallow, generally not exceeding 50 feet.

Further proof of high-latitude elevation in the Glacial period is afforded by the river-valleys of the coast region now filled with water, that is the *fjords*, and the multitudes of islands, and many channels among islands, along fiord coasts. The fjords of Maine, Labrador, Newfoundland, Greenland, British Columbia and Alaska, and those of Scandinavia, western South America south of 41° , of Tasmania and South Australia, are such valleys, and *they all are confined to Glacial latitudes*. None occur on southern Africa, which reaches only to $34^{\circ} 22' S$. They were made when the land stood high enough for the denudation of the rocky coast region; and in view of the great lift the continent and other continents were having in the Later Tertiary time and during the opening Quaternary, it is a reasonable supposition, as the author pointed out in 1856, that the work of excavation should have gone forward during the Glacial period. It cannot be affirmed that the work of denudation was not *begun* during emergencies long before; but if so, this period of so widely extended elevation, probably the greatest in the world's history, must have finished the work.

Some of the fjords of the Atlantic coast between southern Maine and Hudson Bay have been found by soundings, as stated by Spencer, to have depths of 2000 to 3670 feet below the sea level; and the St. Lawrence channel below the Saguenay has afforded soundings of 1104 and 1878 feet. The Saguenay gorge descends 300 to 840 feet below the sea level and rises 1500 feet above it. They compare well with the fjords of the Scandinavian coast, several of which are above 2000 feet in depth, and one, the Sogne Fiord, 4020 feet.

The fjords of a coast differ widely in breadth and depth; and the deepest and largest were probably those channels that had been excavated to the sea level, during the time of emergence, while others are the shallower gorges of the denuded region. They have generally at present a bottom of drift