

What Mr. Carver relates concerning this subject rather tends to confirm the opinion that the waters of the Lake do rise periodically. "I had like (he says) to have omitted a very extraordinary circumstance relative to these Straits (of Michilimackinac, between Lakes Michigan and Huron). According to observations made by the French, whilst they were in possession of the fort there, although there is no diurnal flood or ebb to be perceived in these waters, yet from an exact attention to their state a periodical alteration has been discovered. It was observed that they arose by gradual but almost imperceptible degrees till they had reached the height of three feet. This was accomplished in seven and a half years; and in the same space of time they as gently decreased, till they had reached their former situation. So that in fifteen years they had completed their inexplicable revolution. At the time I was there, the truth of these observations could not be confirmed by the English, as they had then been only a few years in possession of the fort, but they all agreed that some alteration in the limits of the Straits was apparent." "It is to be lamented (judiciously added Mr. Weld) that succeeding years have not thrown more light on this subject. . . . A long series of observations are necessary to determine positively whether the waters of the Lakes do or do not rise and fall periodically. It is well known, for instance, that in wet seasons they rise much above the ordinary level, and that in very dry seasons they sink considerably below it; a close attention, therefore, ought to be paid to the quantity of rain that falls, and to evaporation; and it ought to be ascertained in what degree the height of the Lake is altered thereby, otherwise, if it happens to be higher or lower than usual on the seventh year, it would be impossible to say with accuracy whether it were owing to the state of the weather, or to certain laws of nature, that we are as yet unacquainted with. At the same time great attention ought to be paid to the state of the winds, as well in respect to their direction as to their velocity—for the height of the water in all the Lakes is materially affected thereby. Moreover, these observations ought not to be made at one place only, but at different places at the same time. . . .

"It is also believed by many persons that the waters of Lake Ontario not only rise and fall periodically every seventh year, but that they are likewise influenced by a tide which ebbs and flows frequently in the course of twenty-four hours—as, for instance, in the Bay of Quinté, where it has been observed to rise fourteen inches every four hours. But there can be no doubt that this must be caused by the wind—no such regular fluctuation being observed at Kingston, and this Bay being a long crooked inlet, that grows narrower at the upper end; and therefore not only a change of wind up and down would make a difference at the upper extremity, but the waters, being concentrated there, would be seen to rise or fall, if impelled even in the same direction, whether up or down, more or less forcibly at one part of the day than another. . . . An appearance like a tide must therefore be seen almost constantly at the head of this Bay, whenever there is a breeze. I could not learn that the fluctuation had ever been observed during a perfect calm; were the waters, however, influenced by a regular tide, during a calm, that would be most readily seen."

a few verbal errors; but whatever their defects may be, compared with the originals, the reader may be assured that there was no intention to alter or distort the meaning or merits of the author, and that they may therefore be considered as a faithful epitome of more extended observations.

* The destruction of these trees would depend more on the length of time they were inundated, than on the mere fact of their having been temporarily flooded.—R. L.

Reserving any comments on the foregoing pertinent extracts for a future page, I proceed to remark, that such continued to be the unsatisfactory amount of information on this interesting debatable philosophical question, till about 1819, when Capt. (afterwards Col.) Whiting, of the American Army, at length recurring to the exciting subject, made, at the request of Governor Cass, a series of regular observations upon these oceanic appearances, during seven or eight days, in the month of June, serving to show that at that remarkable inlet, Green Bay, there is a daily rise and fall, but that it is irregular as to the precise period of flux and reflux, and also as to the height which it attains;* and yet such was the variety of opinion among local residents on the fact, that he is compelled to state, in the course of his remarks, that being led to suppose that the winter would be the most favourable time for making such observations, when the superincumbent ice would nearly destroy the influence of the winds, and show the unassisted operation of the tide, he made enquiries as to its appearance during that season, when one gentleman informed him that no tide was then discernible, while another, equally intelligent, assured him that it was *very apparent*, and that there was a regular elevation and depression of the ice!

From all which conflicting circumstances (as judiciously observed by (I think) Mr. Schoolcraft in the same article) there was reason to conclude that a well-conducted series of experiments would prove that there are no regular tides in the Lakes; at least, that they do not ebb and flow twice in twenty-four hours, like those of the ocean; that the oscillating motion of the waters is therefore not attributable to planetary attraction; and that it is very variable as to the periods of its flux and reflux, depending upon the levels of the several Lakes, their length, depth, direction, and conformation, upon the prevalent winds and temperature, and upon other extraneous causes, which are in some measure variable in their nature, and unsteady in their operation.

Colonel Whiting further remarks in another interesting article on the supposed tides and periodical rise and fall of the North American Lakes,† in which is given a table of observations kept at Green Bay, in six weeks, July and August, 1828, that an examination of that record would satisfy any one that planetary influence had little or nothing to do with the changes of elevation in the waters there noted; and that it was as certain that the fluctuations in some places appear to be independent of atmospheric as of lunar control; as, by consulting that table, there would probably not be found one instance where the time of high water tallies with the moon's southing, admitting the usual retardation. And further, that it would also be seen that the changes of elevation were independent of the course of the wind; for that the fluctuation continues, notwithstanding the winds remaining the same. He, therefore, came to the conclusion that, reasoning from our knowledge of the great inland waters of the other hemisphere, we should take it for granted that the North American Lakes have no sensible tides; the Caspian, Black, and Baltic Seas being said to have none worthy of observation, and even the Mediterranean being indebted to the sharp-sightedness of modern times for the knowledge of there being such a phenomenon on her wide-spread bosom.‡ Col. Whiting, however subsequently remarks, writing in 1830, with regard to what General Dearborn terms "the periodical increase of the whole volume of waters in the American Lakes," that it is the popular tradition on these Lakes that there has been a rise and fall once

† See American Journal of Science, Vol. 16, pp. 90 and 91.

‡ See American Journal of Science, Vol. 20, pp. 205 to 219.

§ See close of this article.—R. L.