

the lake, of course, favor the thickening of the soil near the surface, when perhaps the succeeding season will be accompanied by low water, with the consequent distribution of the sediments in only the deeper portions of the area.

*Lake Fluctuations.*—In order to ascertain what proportion of the elevation of the bottom of the swamp was due to the sediments. I succeeded in getting some of the records of the fluctuations of the lake levels. In a Smithsonian contribution Col. Whittlesea has published a more or less complete register of the fluctuation of Lake Ontario at the port of Oswego between the years 1815 and 1857. The earliest of these records begins in 1815 and is continued for the next twelve years, during which time the annual fluctuation was very considerable, the extremes being as much as 4.5 feet. From 1840 to 1853 the maximum difference of levels was only two feet; while that from 1859 to 1873 (obtained from other records) was 2.8 feet.

The question arose whether the lands were rising (or water sinking) or not. At Oswego the mean height of the water between 1840 and 1853 was about nine-tenths of a foot higher than between 1815 and 1827. As the records obtained from 1859 to 1873 are not from same datum I cannot compare them with previous years. But if we take the heights from 1859 to 1866 inclusive, and those from 1867 to 1873 inclusive we find that during the later period, at Oswego, the waters were about nine-tenths of a foot lower. The table of fluctuations (obtained from Captain Fairgrieve, of Hamilton) for Toronto Harbor shows that the mean height of the water between 1874 and 1865 was one foot lower than that between 1864 and 1854 inclusive. In computing these heights the records for two years in each period are incomplete, therefore they have not been included in the calculations. The following are the mean heights of the lake at Toronto above a given datum mark for the years:—

|                     |                     |
|---------------------|---------------------|
| 1854.....1.55 feet. | 1865.....1.00 feet. |
| 1855.....1.30 "     | 1866.....—          |
| 1856.....1.46 "     | 1867.....1.10 "     |
| 1857.....—          | 1868.....0.60 "     |
| 1858.....2.25 "     | 1869.....—          |
| 1859.....2.33 "     | 1870.....2.50 "     |
| 1860.....1.12 "     | 1871.....0.83 "     |
| 1861.....—          | 1872.....0.40 "     |
| 1862.....2.17 "     | 1873.....0.40 "     |
| 1863.....1.62 "     | 1874.....1.00 "     |
| 1864.....2.70 "     |                     |