

according to the theory under consideration, in the space now occupied by the moraine of the Dora Riparia, between Susa and Turin (see map, p. 306). Signor Gastaldi has shown that all the ponds in that area consist exclusively of what M. de Mortillet has denominated *morainic lakes*, i. e. caused by barriers of glacier-mud and stones.

5thly. In proof of the great lakes having had no existence before the glacial period, Professor Ramsay observes that we do not find in the Alps any freshwater strata of an age intermediate between 'the close of the miocenic and the commencement of the glacial epoch.'* But although such formations are scarce, they are by no means wholly wanting; and if it can be shown that any one of the principal lakes, that of Zurich for example, existed prior to the glacial era, it will follow that in the Alps the erosive power of ice was not required to produce lake-basins on a large scale. The deposits alluded to on the borders of the lake of Zurich are those of Utnach and Dürnten, situated each about 350 feet above the present level of the lake, and containing valuable beds of lignite.

The first of them, that of Utnach, is a delta formed at the head of the ancient and once more extensive lake. The argillaceous and lignite-bearing strata, more than 100 feet in thickness, rest unconformably on highly inclined and sometimes vertical miocene molasse. These clays are covered conformably by stratified sand and gravel sixty feet thick, partly consolidated, in which the pebbles are of rocks belonging to the upper valleys of the Limmat and its tributaries, all of them small and not glacially striated, and wholly without admixture of large angular stones. On the top of all repose very large erratic blocks, affording clear evidence that the colossal glacier which once filled the valley of the Limmat covered

* Geol. Quart. Journ. vol. xviii.