

by transverse folding as to interrupt the continuous slope of its water-line, with the result that the depression filled up and formed a lake. To this explanation, however, Ramsay made objection, and suggested a glacial origin as agreeing with the fact that all these lakes on the Italian slope of the Alps opening into the plain of the Po have strong moraines at their southern margins. Davis<sup>1</sup> at first admitted that both of these causes might be concerned, and considered that their relative importance could not be estimated. In a later paper,<sup>2</sup> however, he stated he had come upon certain phenomena in the Alps and in Norway that demanded wholesale glacial erosion for their explanation. An examination of the district about the Lake of Lugano had not led to the discovery of any effects of warping and tilting, such as must of necessity be present if Lyell's theory of the origin of the lakes be the correct one. On the other hand, the evidence of strong glacial erosion was very marked.

Beginning at the west and taking these valleys in order, we have the Dora Baltea, which led a vast glacier down from Mont Blanc to the great moraines of Ivrea (from 1000 to 2000 feet in height), and yet is lakeless excepting for several small basins caught in the moraines; the Sesia, which is lakeless; the Toce with the Lake of Orta; the Ticino with Lake Maggiore and several small lakes, Comabbio, Varese, etc., between the morainal deposits; the small valley of the Agno and Cassorate, of less size than many lakeless valleys, and yet occupied by the Lake of Lugano; the Adda with the Lake of Como in its branching course, and Annone, Pusiano, and other lakes in its terminal moraine; the Bremba and Serio, both lakeless; the Oglio with the Lake of Iseo and well-marked moraines; the Chiese with the Lake of Idro; the Sarca with the Lake of Garda, the largest of all and projecting farthest into the plain, with a great lobed moraine to enclose it.

**Lake of Orta** lies 951 feet above sea-level, is 8 miles long by about 5 miles in maximum breadth, and has an area of about 7 square miles. A subaqueous ridge divides it into two basins, of which the northern one is the deeper, attaining a maximum depth of 469 feet, the mean depth being 233 feet; the volume of water is estimated at 45,669 million cubic feet. The temperature of the bottom water never falls below 39°·2 Fahr. It differs from the other Italian lakes in having its outflow not in the natural line of the drainage, viz. to the south, but to the north. This is due to the southern end being closed by a moraine.

**Lake Maggiore** lies 636 feet above sea-level, and covers an area

<sup>1</sup> "Classification of Lake Basins," *Proc. Boston Soc. Nat. Hist.*, vol. xxi. p. 358, 1883.

<sup>2</sup> "Glacial Erosion in France, Switzerland, and Norway," *Proc. Boston Soc. Nat. Hist.*, vol. xxix. p. 273, 1901.