

rock. Another similar block has been raised in Germany into a monument to the geologist Leopold von Buch.

These erratic blocks which are met with in the plains of Russia, Poland, and Prussia, and in the eastern parts of England, are composed of rocks entirely foreign to the region where they are found. They belong to the primary rocks of Norway; they have been transported to their present sites, protected by a covering of ice, by the waters of the northern deluge. How vast must have been the impulsive force which could carry such enormous masses across the Baltic, and so far inland as the places where they have been deposited for the surprise of the geologist or the contemplation of the thoughtful!

The second European deluge is supposed to have been the result of the formation and upheaval of the Alps. It has filled with débris and transported material the valleys of France, Germany, and Italy over a circumference which has the Alps for its centre. The proofs of a great convulsion at a comparatively recent geological date are numerous. The Alps may be from eighty to 100 miles across, and the probabilities are that their existence is due, as Sir Charles Lyell supposes, to a succession of unequal movements of upheaval and subsidence; that the Alpine region had been exposed for countless ages to the action of rain and rivers, and that the larger valleys were of pre-glacial times, is highly probable. In the eastern part of the chain some of the Primary fossiliferous rocks, as well as Oolitic and Cretaceous rocks, and even Tertiary deposits, are observable; but in the central Alps these disappear, and more recent rocks, in some places even Eocene strata, graduate into metamorphic rocks, in which Oolitic, Cretaceous, and Eocene strata have been altered into granular marble, gneiss, and other metamorphic schists; showing that eruptions continued after the deposit of the Middle Eocene formations. Again, in the Swiss and Savoy Alps, Oolitic and Cretaceous formations have been elevated to the height of 12,000 feet, and Eocene strata 10,000 feet above the level of the sea; while in the Rotal, in the Bernese Alps, occurs a mass of gneiss 1,000 feet thick between two strata containing Oolitic fossils.

Besides these proofs of recent upheaval, we can trace effects of two different kinds, resulting from the powerful action of masses of water violently displaced by this gigantic upheaval. At first broad tracks have been hollowed out by the diluvial waves, which have, at these points, formed deep valleys. Afterwards these valleys have been filled up by materials derived from the mountain and transported into the valley, these materials consisting of rounded pebbles, argillaceous