


CHAPTER V.

THE PROPER TEMPERATURE OF THE GLOBE—ON THE LAW WHICH REGULATES THE INCREASE OF HEAT IN ITS DEPTHS—DIRECT OBSERVATIONS UPON THE INCREASED TEMPERATURE IN THE INTERIOR OF MINES AND ARTESIAN WELLS—TEMPERATURE OF THERMAL WATERS AND VOLCANIC LAVAS.

O prove the existence of an incandescent nucleus in the centre of the terrestrial mass is now-a-days unnecessary, because it is the accepted foundation of all modern geology. Disputed at the close of the last century by Werner—the great chief of the Neptunian school—it has been established in the clearest possible manner by two of Werner's own pupils—Leopold von Buch and Alexander von Humboldt.* What we have, then, to discuss in our

* [*Werner.*—*Von Buch.*—*Humboldt.*—*Abraham Gottlieb Werner* was born at Wehlau, in Upper Lusace, on the 25th of September 1750; and died at Dresden, on the 30th of June 1817. His treatise on the stratification of rocks appeared in 1787. He argued in it that the formation of the rocks composing the earth's crust was owing to chemical precipitation from water. The Neptunian system, as it was called, found many warm supporters, but eventually it was opposed, and, to a certain extent, confuted, by Hutton and his followers, the partisans of the Plutonian system. The truth appears to lie between the two extremes: fire was a powerful agent in the stratification of the rocks, but their present appearance is also largely owing to the action of water, especially in the shape of ice.

Leopold von Buch, one of the most eminent of modern geologists, was born at Uckermark, on the bank of the Oder, in 1774; died in 1853. His attention was early directed to geological studies, in which he was destined to effect a remarkable revolution. He began as the pupil and disciple of Werner; he ended by completely overthrowing the Neptunian system, and giving due prominence to the remarkable results of igneous action. He was a great traveller, and his exploration of the principal volcanic regions of Europe led him to important conclusions, which are now accepted among the fundamental principles of geological science.

We owe to Von Buch the doctrine of the elevation by igneous force of mountains and continents; clear and definite views upon the mechanism of the formation of volcanoes; the theory of the shifting of the beds of oceans in accordance with the upheaval of mountains; and the all-important truth of the unconformity of strata.

Friedrich Heinrich Alexander, Baron von Humboldt, was of noble birth and ancient lineage, and born at Berlin on the 14th of September 1769. After a careful preliminary education he was sent, at the age of seventeen, to the university of Frankfort-on-the-Oder, whence he repaired, in 1788, to Göttingen, studying under Heyne, Blumenbach, and Eichhorn. In 1790 he accompanied the naturalist Forster in a tour through Germany, Holland, and England. Shortly afterwards he was appointed director-general of the mines of Anspach and Bayreuth, in which capacity he wrote and published his "Specimen Flora Freibergensis."