

representing rock formed from a completely molten magma. In spite of Desmarest's mistaken views about the relationship of basalt to porphyry and granite, he was the first clear exponent of the igneous origin of these rocks. He was besides a pioneer in the comparative method of studying the igneous rocks. Papers confirming Desmarest in his estimate of the igneous origin of basalt, porphyry, and granite were contributed by Raspe in Hesse, by Professor Arduino in Padua, and by Mr. Strange, the English consul in Venice.

Faujas de Saint-Fond (1742-1819), Professor in the Museum of Natural History in Paris, brought forward conclusive evidences of the igneous origin of basalt in his famous work entitled, *On the Extinct Volcanoes of Vivarais and Velay*. The work contains a detailed mineralogical investigation of the ejected material of active volcanoes, and compares them with the rocks present in Vivarais and Velay. In the course of his journeys in Southern France he found a volcanic tuff identical with the Pozzuolo earth, and established the flourishing industry of the preparation of cement. Saint-Fond's descriptions and illustrations of the extinct volcanoes in Vivarais and Velay are excellent, and have scarcely been surpassed in later publications.

The fearful earthquake which destroyed Lisbon in 1755 was made the subject of a large number of scientific inquiries into the causes of earthquakes. William Stukeley's theory, attributing earthquakes to electrical disturbances, gained a certain amount of support abroad. Another Englishman, Mr. Michell, suggested that the sudden expansion of vapours enclosed in fissures and cavities of the earth's crust caused earthquakes and volcanoes, the upheaval of mountain-systems, and the deformation of the rocks.

THIRD PERIOD—THE HEROIC AGE OF GEOLOGY, FROM 1790 TO 1820.

The characteristic features of this age, and that which gave it a rejuvenating significance in the development of geology, was the determined spirit that prevailed to discountenance speculation, and to seek untiringly in the field and in the laboratories after new observations, new truths.