of weakness. His description of basaltic inflows into subterranean cavities formed by crust-expansion and elevation anticipated later conceptions of laccolitic occurrences of volcanic material.

Before Von Buch had completed his work on the Canary Islands for publication, the Englishman, Dr. Daubeny (1819), published a tabulated summary of active volcanoes, together with an enumeration of all volcanic and earthquake phenomena reported within historic times. In 1824 the second volume of Carl von Hoff's work appeared, and it embraced an exhaustive account of surface changes associated with volcanic outbreaks and earthquake shocks. Von Hoff followed the opinions of his compatriots, Humboldt and Buch, on all questions regarding the origin and destruction of volcanoes.

A series of careful researches was carried out in the volcanic areas of the Rhine Province by Johann Steininger, a teacher in the Treves public school. Steininger established the difference between the volcanic rocks of the Eifel district and the trap-porphyry rocks (melaphyre, porphyrite, palatinite) of the district of Oldenburg and the Palatinate. Both were regarded by Steininger as submarine in origin, but he referred the eruptions to quite different geological ages. He pointed out that a characteristic feature of the Eifel volcanoes was the frequent occurrence of lava and volcanic slag and ash without any sign of an orifice or eruption. The volcanoes of the Lower Rhine district, especially the Siebengebirge, near Bonn, were explained as upraised conical mountains in which the volcanic material seldom escaped at the surface. In his *Contributions to the History of the Rhineland Volcanoes*, published in 1821, Steininger proved that a certain number of the volcanoes, chiefly those on the right bank of the Rhine, had originated contemporaneously with the formation of the brown-coal deposits (Tertiary), and were therefore older than the pebble and clay deposits with fossil mammalian bones (mammoth, rhinoceros); but, he added, the products of the youngest volcanoes on the left bank of the Rhine seemed to be distributed above these pebble-beds, and might accordingly belong to historic times. The idea of the quite recent occurrence of those volcanoes originated from a mistaken reading of a reference made to the volcanoes of this area by Tacitus.

In his earlier writings Steininger was under the influence of Von Buch's theory of elevation-craters, but his close