

over the surrounding country, and with no accompanying fragmentary discharges. But the mere absence of ashes and scorïæ is no proof that these did not once exist, or that the present knob or boss of lava may not originally have solidified within a cone of tuff which has been subsequently removed in denudation. The extent to which the surface of the ground has been changed by ordinary atmospheric waste, and the comparative ease with which loose volcanic dust and cinders might have been entirely removed, require to be considered. Hence, though the ordinary explanation is no doubt in some cases correct, it may be doubted whether a large proportion of the examples cited from the Rhine, Bohemia, Hungary, and other regions, ought not rather to be regarded, like the "necks" so abundant in the ancient volcanic districts of Britain (Book IV. Part VII.), as the remaining roots of ordinary volcanic cones. If the tuff of a cone, up the funnel of which lava rose and solidified, were swept away, we should find a central lava plug or core resembling the volcanic "heads" (*vulkanische Kuppen*) of Germany. Unquestionably, lava has in innumerable instances risen in this way within cones of tuff or cinders, partially filling them without flowing out into the surrounding country.¹⁸³

But while, on either explanation of their origin, these volcanic "heads" find their analogues in the emissions of lava in modern volcanoes, there are numerous cases in old volcanic areas where the eruptions, so far as can now be judged, were not attended with the production of any central cone or crater. Such emissions of lava may have

¹⁸³ Von Seebach, Z. Deutsch. Geol. Ges. xviii. p. 643. F. von Hochstetter, Neues Jahrb. 1871, p. 469. Reyer, Jahrb. K. K. Geol. Reichsanstalt, 1878, p. 81; 1879, p. 463.