

rife at intervals during a long succession of geological ages. Even round the sites of still active vents, traces of far older eruptions may be detected, as in the case of the existing active volcanoes of Iceland, which rise from amid Tertiary lavas and tuffs. Volcanic action, which now manifests itself so conspicuously along certain lines, seems to have continued in that linear development for protracted periods of time. The actual vents have changed, dying in one place and breaking out in another, yet keeping on the whole along the same tracts. Taking all the manifestations of volcanic action together, both modern and ancient, we see that the subterranean forces have operated along great lines in the earth's crust, and that the existing volcanoes form but a small proportion of the total number of once active vents.

Looking broadly at the geological history of volcanic action we observe that, while there is evidence of the protrusion of both acid and basic materials from the remotest periods, the earlier discharges were preponderantly acid. In Britain, for example, the vast piles of lavas ejected during the Silurian period were mainly of a felsitic character, though considerable accumulations of andesites were not wanting. On the other hand, the wide sheets of lava poured out in this country during Tertiary time were chiefly basalts, the acid protrusions occurring mostly as dikes and bosses. A similar broad sequence has been observed in other countries.

When, however, we proceed to consider more closely the nature of the successive eruptions during the continuance of one of the volcanic periods of which records are preserved among the geological formations, we discover proofs of a remarkable variation in the character of the lavas.<sup>154</sup> Various

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<sup>154</sup> In some volcanoes (*e.g.* Teneriffe) the lower lavas are heavier and more basic than the upper.