mentary volcanic material are justly regarded as proofs of the superficial manifestation of volcanism, and in the vast majority of cases they occur in beds which were accumulated on the surface, as the result of successive explosions. Yet cases, which will be immediately described, may be found in many old volcanic districts, where such fragmentary materials, falling back into the volcanic funnels, and filling them up, have been compacted there into solid rock; they may occasionally have been produced by explosions of lava within subterranean caverns.

The general law which has governed the intrusion of igneous rock within the earth's crust may be thus stated: Every fluid mass impelled upward by pressure from below, or by the expansion of its own imprisoned vapor, has sought egress along the line of least resistance. That line has depended in each case upon the structure of the terrestrial crust and the energy of eruption. It may have been determined by an already existent dislocation, by planes of stratification, by the surface of junction of two unconformable formations, by contemporaneously formed cracks, or by other more complex lines of weakness. Sometimes the intruded mass has actually fused and obliterated some of the rock which it has invaded, incorporating a portion into its own substance. The shape of the channel of escape has thus determined the external form of the intrusive mass, as the mold regulates the form assumed by cast-iron. This relation offers a very convenient means of classifying intrusive rocks. According to the shape of the mold in which they have solidified, they may be arranged as—(1) bosses or amorphous masses, (2) sheets, (3) veins and dikes, and (4) necks.