

structure were formed by igneous agency, and this in ancient cases is not the less certain though the vesicles have since been filled by the infiltration and deposition of mineral matters in solution, such as carbonate of lime, zeolites and silica. Such igneous rocks are called amygdaloids, and it has not infrequently happened that on the surfaces of old masses of rock, the amygdaloidal kernels, say of carbonate of lime, have been dissolved out by the influence of rain-water bearing carbonic acid, and the surface has regained its original vesicular appearance.

Experience also tells us that some modern lavas are crystalline—that is to say, in cooling, their constituents, according to their chemical affinities, have crystallised in distinct minerals such as augite, various feldspars, &c. When we meet with similar, even though not identical crystalline rocks, such as feldspar—porphyries, trachytes, diorites and dolorites, associated with old strata, we are therefore entitled to consider them as having had an igneous origin.

In modern volcanic regions, such as Iceland, and in tertiary regions dotted with extinct volcanoes of Miocene or later age, where the forms of the craters still remain, the lavas are often columnar; and when we meet with columnar and crystalline rock-masses of Silurian, Carboniferous, or of any other geological age, we may fairly assume that such rocks are of igneous origin. Modern lavas have often a vitreous structure (glassy) such as obsidian, which its ancient analogue pitchstone closely resembles. Others possess a slaggy structure, and are sometimes formed of wavy ribboned layers that indicate a state of viscous flowing, similar to the contorted ribbon-like structure common in iron and other slags. Iron slag in fact is nothing but arti-