by heat. The crystalline structure identical with or similar to some modern lavas, the occasional columnar structure, the amorphous earthy look, also common in certain lavas, the slaggy, ribboned, and vesicular structures, the penetration of strata by dykes and veins, and the alteration of the stratified rocks at the lines of contact, all prove the point.

Modern volcanic ashes are simply fragments, small and large, of lava ground often to powder in the crater by the rise and fall of the steam-driven rocky material. This is finally ejected by the expansive force of steam, and with the liberated vapour, volcanic dust, lapilli and blocks of stone, are sometimes shot thousands of feet into the air mingled with watery vapour, which condensing in the higher atmosphere, falls with the ashes on the sides of the volcanic cone in heavy showers of rain. By the study of modern volcanic ashes, it is, after practice, not difficult to distinguish those of ancient date, even though they have become consolidated into hard stratified rocks. Their occasional tufaceous character, the broken crystals, the imbedded slaggy-looking fragment of rocks and bombs, and sometimes the occurrence of coarse volcanic conglomerates, every fragment of which consists of broken lava, all help in the decision. In fact, tracing back, from modern to ancient volcanoes, step by step through the various formations, the origin of ancient volcanic rocks is clear; and further, it leads to similar conclusions with respect to the igneous origin of bosses of crystalline rocks, such as some granites, syenites, and dioritic masses which, having been melted and cooled deep in the earth, were not ejected, and never saw the light till they were *exposed by denudation.*