

general structure of the beds (Pl. VIII. fig. 5). They consist in a descending series of—1. Porphyritic trachyte; a volcanic rock, 160 feet in thickness. 2. Arenaceous tufa. 3. Columnar basalt. 4. Breccia, made up of volcanic fragments, cemented together by tufa. 5. Thick beds of basalt. 6. White ferruginous tufa, enveloping fragments of granite, basalt, &c. This bed is traversed by veins of the overlying basalt.

I may add, that the volcanic vents of central France are evidently of very different ages; some being of immense antiquity, while others must be of comparatively recent origin, for they have exploded through the older beds of basalt.

44. FRESH-WATER LIMESTONE, AND ORGANIC REMAINS OF AUVERGNE.—The volcanic rocks of this district present alternations of limestone, abounding in fresh-water shells and other animal remains; with basalt, scoriæ, and other igneous productions, based on a foundation of granite. These beds are arranged in the following order, beginning with the lowest or most ancient:—

1st. Clay, sand, and breccia, without organic remains.

2d. Limestone and calcareous marl, in strata nearly horizontal; about 900 feet thick. These are entirely of fresh-water origin, and abound in shells of the genera *potamides*, *helix*, *planorbis*, and *lymnea*, which are known to inhabit lakes and rivers. Some of the beds contain bitumen; others are