

A hasty observation of the white limestone and flint of Aurillac might convey the idea that the rock was of the same age as the white chalk of Europe; but when we turn from the mineral aspect and composition to the organic remains, we find in the flints of the Cantal seed-vessels of the freshwater *Chara*, instead of the marine zoophytes so abundant in chalk flints; and in the limestone we meet with shells of *Limnea*, *Planorbis*, and other lacustrine genera.

Proofs of gradual deposition.—Some sections of the foliated marls in the valley of the Cer, near Aurillac, attest, in the most unequivocal manner, the extreme slowness with which the materials of the lacustrine series were amassed. In the hill of Barrat, for example, we find an assemblage of calcareous and siliceous marls; in which, for a depth of at least 60 feet, the layers are so thin, that thirty are sometimes contained in the thickness of an inch; and when they are separated, we see preserved in every one of them the flattened stems of *Charæ*, or other plants, or sometimes myriads of small *Paludinæ* and other freshwater shells. These minute foliations of the marl resemble precisely some of the recent laminated beds of the Scotch marl lakes, and may be compared to the pages of a book, each containing a history of a certain period of the past. The different layers may be grouped together in beds from a foot to a foot and a half in thickness, which are distinguished by differences of composition and color, the tints being white, green, and brown. Occasionally there is a parting layer of pure flint, or of black carbonaceous vegetable matter, about an inch thick, or of white pulverulent marl. We find several hills in the neighborhood of Aurillac composed of such materials, for the height of more than 200 feet from their base, the whole sometimes covered by rocky currents of trachytic or basaltic lava.*

Thus wonderfully minute are the separate parts of which some of the most massive geological monuments are made up! When we desire to classify, it is necessary to contemplate entire groups of strata in the aggregate; but if we wish to understand the mode of their formation, and to explain their origin, we must think only of the minute subdivisions of which each mass is composed. We must bear in mind how many thin leaf-like seams of matter, each containing the remains of myriads of testacea and plants, frequently enter into the composition of a single stratum, and how vast a succession of these strata unite to form a single group! We must remember, also, that piles of volcanic matter, like the Plomb du Cantal, which rises in the immediate neighborhood of Aurillac, are themselves equally the result of successive accumulation, consisting of reiterated sheets of lava, showers of scorix, and ejected fragments of rock.—Lastly, we must not forget that continents and mountain-chains, colossal as are their dimensions, are nothing more than an assemblage of many such igneous and aqueous groups, formed in succession during an indefinite lapse of ages, and superimposed upon each other.

Bourdeaux, Aix, &c.—The Upper Eocene Strata in the Bourdeaux

* Lyell and Murchison, sur les Dépôts Lacustres Tertiaires du Cantal, &c. Ann. des Sci. Nat. Oct. 1829.