gravelly and sandy beds of Lake Superior no pebbles of modern volcanic rocks can be included, since there are none of these at present in the district. If igneous action should break out in that country, and produce lava, scoriæ, and thermal springs, the deposition of gravel, sand, and marl might still continue as before; but, in addition, there would then be an intermixture of volcanic gravel and tuff, and of rocks precipitated from the waters of mineral springs.

Although the freshwater strata of the Limagne approach generally to a horizontal position, the proofs of local disturbance are sufficiently numerous and violent to allow us to suppose great changes of level since the lacustrine period. We are unable to assign a northern barrier to the ancient lake, although we can still trace its limits to the east, west, and south, where they were formed of bold granite eminences. Nor need we be surprised at our inability to restore entirely the physical geography of the country after so great a series of volcanic eruptions; for it is by no means improbable that one part of it, the southern, for example, may have been moved upwards bodily, while others remained at rest, or even suffered a movement of depression.

Whether all the freshwater formations of the Limagne d'Auvergne belong to one period, I cannot pretend to decide, as large masses both of the arenaceous and marly groups are often devoid of fossils. Some of the oldest or lowest sands and marls may very probably be of Middle Eocene date. Much light has been thrown on the mammiferous fauna by the labors of MM. Bravard and Croizet, and by those of M. Pomel. The last-mentioned naturalist has pointed out the specific distinction of all, or nearly all, the species of mammalia from those of the gypseous series near Paris, although many of the forms are analogous to those of Eocene quadrupeds. The *Cainotherium*, for example, is not far removed from the *Anoplotherium*, and is, according to Waterhouse, the same as the genus *Microtherium* of the Germans. There are two species of marsupial animals allied to *Didelphys*, a genus also found in the Paris gypsum, and several forms of ruminants of extinct genera, such as *Amphitragulas elegans* of Pomel, which has been identified with a Rhenish species from Weissenau near Mayence, called by Kaup *Dorcatherium nanum*; other associated fossils, e. g., *Microtherium Reuggeri*, and a small rodent, *Titanomys*, are also specifically the same with mammalia of the Mayence basin. The *Hyænodon*, a remarkable carnivorous genus, is represented by more than one species, and the oldest representative of the genus *Machairodus* has been discovered in these beds in Auvergne. The first of these, *Hyænodon*, also occurs in the English Middle-Eocene marls of Hordwell cliff, Hampshire, considerably below the level of the Bembridge limestone, with Paleotheria. Upon the whole it is clear that a large portion of the Limagne rocks have been correctly referred by French geologists to their Middle Tertiary, and to that part of it which is called Upper Eocene in this work.

Cantal.—A freshwater formation, of about the same age and very analogous to that of Auvergne, is situated in the department of Haute