

time some fine caves exist in the Silurian formation, such as the *Grotto des Demoiselles* (Fig. 194) near Ganges, of Hérault. It should be added, in order to complete the explanation of the cave formations, that the greater part of these vast internal excavations have been chiefly caused by subterranean watercourses, which have eroded and washed away a portion of the walls, and in this manner greatly enlarged their original dimensions.

But there are other modes than the above of accounting, in a more satisfactory manner, for the existence of these caves. According to Sir Charles Lyell, there was a time when (as now) limestone rocks were dissolved, and when the carbonate of lime was carried away gradually by springs from the interior of the earth; that another era occurred, when engulfed rivers or occasional floods swept organic and inorganic débris into the subterranean hollows previously formed; finally, there were changes, in which engulfed rivers were turned into new channels, and springs dried up, after which the cave-mud, breccia, gravel, and fossil bones were left in the position in which they are now discovered. "We know," says that eminent geologist,\* "that in every limestone district the rain-water is *soft*, or free from earthy ingredients, when it falls upon the soil, and when it enters the rocks below; whereas it is *hard*, or charged with carbonate of lime, when it issues again to the surface in springs. The rain derives some of its carbonic acid from the air, but more from the decay of vegetable matter in the soil through which it percolates; and by the excess of this acid, limestone is dissolved, and the water becomes charged with carbonate of lime. The mass of solid matter silently and unceasingly subtracted in this way from the rocks in every century is considerable, and must in the course of thousands of years be so vast, that the space it once occupied may well be expressed by a long suite of caverns."

The most celebrated of these bone-caves are those of Gailenreuth, in Franconia; of Nabenstein, and of Brumberg, in the same country; the caves on the banks of the Meuse, near Liège, of which the late Dr. Schmerling examined forty; of Yorkshire, Devonshire, Somersetshire, and Derbyshire, in England; also several in Sicily, at Palermo, and Syracuse; in France at Hérault, in the Cévennes, and Franche Comté; and in the New World, in Kentucky and Virginia.

The *ossiferous breccia* differs from the bone-caves only in form. The most remarkable of them are seen at Cette, Antibes, and Nice, on the shores of Italy; and in the isles of Corsica, Malta, and Sardinia.

Nearly the same bones are found in the *breccia* which we find in

\* "Elements of Geology," p. 122.