

volcanic magmas. The great majority of caves occur in limestone, dolomite, or gypsum deposits, and owe their origin primarily to the solvent agency of the water circulating through the ground. Water as it passes down rock-fissures attacks the sides of the rock and widens its own channel, the solvent action of the water being greater when it is surcharged with carbonic acid. Larger water-courses find their way into the widened fissures and may erode complicated systems of tunnels and grottoes like those in Carniola, where the subterranean streams act both chemically and mechanically on the neighbouring rock. The streams partially dissolve the material, partially carry it away in suspension, or leave a finely-ground, insoluble deposit on the floor of the cave known as "red earth."

The caverns may be further enlarged by collapse of the roof from time to time. Frequently surface-material, or organic remains imbedded in the deposits above, are thus introduced into limestone caverns. A stream or river-channel eroded in a limestone bed may be intercepted by the occurrence of clefts and swallow-holes, and the superficial stream may thus be guided into the system of subterranean intricacies which had been previously excavated by the chemical action of underground water.

Many caverns were undoubtedly used by the mammals of the diluvial period as shelter-places, just as they were afterwards used by primæval man. Often, however, the remains of mammals that are found imbedded in the soft clay, sand, or loam have been subsequently swept into the caves from the surface in consequence of roof collapse. During the latter half of the nineteenth century it has been a matter of controversy among the authorities on cave remains whether man was or was not a contemporary of the cave-bear, the mammoth, the woolly-haired rhinoceros, and other extinct mammals in Europe. The newest contributions to the literature of ossiferous caves deal more with their topography, physiography, and accessibility. The year 1894 was marked by the publication of two pioneer works in this particular aspect of the study of caves, the one by the Austrian writer, Franz Kraus, the other by the French writer, E. A. Martel.

The purely *mechanical* activity of running water is expressed in the removal and transportation of loosened fragments of rock (ablation), in the grinding action of the transported