

sublimed by the great internal heat these carbonaceous accumulations would form the first provision of aliment for the volcanoes which were now to make their appearance. Volcanic energy, in his view, arises from "the effervescence of the pyritous and combustible stones," combined with the effective co-operation of subterranean electricity, which he believed to be likewise a powerful agent in the production of earthquakes. Volcanoes, however, can only become active by "the conflict of a great mass of water with a great body of fire." Hence they are always near the sea. Buffon computed that the first volcanoes did not arise until some 50,000 years of the earth's history had elapsed, by which time a sufficient quantity of combustible materials had been accumulated to furnish them with fuel, and he drew a graphic picture of the frightful condition of our planet when its surface was at once ravaged by fire and devastated by debacles of water. Only after the cessation of such turmoil could terrestrial animals come into being. During this period the retreating waters of the ocean gave birth to powerful currents, whereby hollows were scoured out of the still comparatively soft sedimentary strata, and thus were originated the valleys of the land which have subsequently been widened and deepened by subaerial denudation.

The Fifth Epoch was marked by a calmer time which witnessed the advent of huge pachyderms—elephants, rhinoceroses, and hippopotamuses—in the northern regions, where at that time a warm climate stretched continuously from Asia and Europe into America. This introduction of terrestrial animal life