

the forest vegetation of the mainland, which was then utterly wanting. All the animals, also, whose remains have been found in archilithic strata, like the plants, lived in water. Only crustacea are met with among the animals with articulated feet, as yet no spiders and no insects. Of vertebrate animals, only a very few remains of fishes are known as having been found in the most recent of all primordial strata, in the upper Silurian. But the headless vertebrate animals, which we call *skull-less*, or *Acrania*, and out of which fishes must have been developed, we suppose to have lived in great numbers during the primordial epoch. Hence we may call it after the *Acrania* as well as after the *Tangles*.

The *primary epoch*, or *the era of Fern Forests*, the second main division of the organic history of the earth, which is also called the palæolithic or palæozoic period, lasted from the end of the Silurian formation of strata to the end of the Permian formation. This epoch was also of very long duration, and again falls into three shorter periods, during which three great systems of strata were deposited, namely, first, the *Devonian* system, or the old red sandstone; upon that, the *Carboniferous*, or coal system; and upon this, the *Permian* system. The average thickness of these three systems taken together may amount to about 42,000 feet, from which we may infer the immense length of time requisite for their formation.

The Devonian and Permian formations are especially rich in remains of fishes, of primæval fish as well as enamelled fish (Ganoids), but the bony fish (Teleostei) are absent from the strata of the primary epoch. In coal are found the most ancient remains of animals living on land, both of arti-