In their organization Ferns rise considerably above Mosses, and in their more highly developed forms even approach the flowering plants. In Mosses, as in Thallus plants, the entire body is composed of almost equi-formal cells, little if at all differentiated; but in the tissues of Ferns we find those peculiarly differentiated strings of cells which are called the vessels of plants, and which are universally met with in flowering plants. Hence Ferns are sometimes united as "vascular Cryptogams" with Phanerogams, and the group so formed is contrasted as that of the "vascular plants" with "cellular plants,"-that is, with "cellular cryptogams" (Mosses and Thallus plants). This very important process in the organization of plants-the formation of vessels -first occurred, therefore, in the Devonian period, consequently in the beginning of the second and smaller half of the organic history of the earth.

The branch of Ferns, or Filicinæ, is divided into five distinct classes: (1) Frondose Ferns, or Pteridæ; (2) Reed Ferns, or Calamaria; (3) Aquatic Ferns, or Rhizocarpeæ; (4) Snakes Tongues, or Ophioglossæ; and (5) Scale Ferns, or Lepidophyta. By far the most important of these five classes, and also the richest in forms, were first the Frondose Ferns, and then the Scale-ferns, which formed the principal portion of the palæolithic forests. The Reed Ferns, on the other hand, had at that time already somewhat diminished in number; and of the Aquatic Ferns, we do not even know with certainty whether they then existed. It is difficult for us to form any idea of the very peculiar character of those gloomy palæolithic fern forests, in which the whole of the gay abundance of flowers of our present flora was entirely wanting, and which were not enlivened

102