

by any birds. Of the flowering plants there then existed only the two lowest classes, the pines and palm ferns, with naked seeds, whose simple and insignificant blossoms scarcely deserve the name of flowers.

The phylogeny of Ferns, and of the Gymnosperms which have developed out of them, has been made especially clear by the excellent investigations which Edward Strasburger published in 1872, on "The Coniferæ and Gnetaceæ," as also "On Azolla." This thoughtful naturalist and Charles Martins, of Montpellier, are among the few botanists who have thoroughly understood the fundamental value of the Theory of Descent, and the mechanical-causal connection between ontogeny and phylogeny. The majority of botanists do not even yet know the important difference between homology and analogy, between the morphological and physiological comparison of parts—which has long since been recognized in zoology—but Strasburger has employed this distinction and the principle of evolution in his "Comparative Anatomy of the Gymnosperms," in order to sketch the outlines of the blood relationship of this important group of plants.

The class among Ferns which has developed most directly out of the Liverworts is the class of real Ferns, in the narrow sense of the word, the *Frondose Ferns* (Filices, or Phyllopterides, also called Pteridæ). In the present flora of the temperate zones this class forms only a subordinate part, for it is in most cases represented only by low forms without trunks. But in the torrid zones, especially in the moist, steaming forests of tropical regions, this class presents us with the lofty palm-like *fern trees*. These beautiful tree-ferns of the present day, which form the chief ornament of