

culated animals (spiders and insects) as well as of vertebrate animals (amphibious animals, like newts and frogs). In the Permian system there occur, in addition to the amphibious animals, the more highly-developed reptiles, and, indeed, forms nearly related to our lizards (*Proterosaurus*, etc.). But, nevertheless, we may call the primary epoch that of *Fishes*, because these few amphibious animals and reptiles are insignificant in comparison with the immense mass of palæozoic fishes. Just as Fishes predominate over the other vertebrate animals, so *Ferns*, or Filices, predominate among the plants of this epoch, and, in fact, real ferns and tree ferns (leafed ferns, or *Phylopteridæ*), as well as bamboo ferns (*Calamophytæ*) and scaled ferns (*Lepidophytæ*). These ferns, which grew on land, formed the chief part of the dense palæolithic island forests, the fossil remains of which are preserved to us in the enormously large strata of coal of the Carboniferous system, and in the smaller strata of coal of the Devonian and Permian systems. We are thus justified in calling the primary epoch either the era of *Ferns* or that of *Fishes*.

The third great division of the palæontological history of development is formed by the *secondary epoch*, or the *era of Pine Forests*, which is also called the mesolithic or mesozoic epoch. It extends from the end of the Permian system to the end of the Chalk formation, and is again divided into three great periods. The stratified systems deposited during this period are, first and lowest, the *Triassic* system, in the middle the *Jura* system, and at the top the *Cretaceous* system. The average thickness of these three systems taken together is much less than that of the primary group, and amounts as a whole only to about 15,000