mud of the black shales. We have thus a remarkable example of a group of plants reduced in modern times to a few insignificant forms, but which played a great *rôle* in the ancient Palæozoic world.

Leaving the Rhizocarps, we may now turn to certain other families of Erian plants. The first to attract our attention in this age would naturally be the Lycopods, the club-mosses or ground-pines, which in Canada and the Eastern States carpet the ground in many parts of our woods, and are so available for the winter decoration of our houses and public buildings. If we fancy one of these humble but graceful plants enlarged to the dimensions of a tree, we shall have an idea of a *Lepidodendron*, or of any of its allies (Figs. 15, 21). These large lycopodiaceous trees, which in different specific and generic forms were probably dominant in the Erian woods, resembled in general those of modern times in their fruit and foliage, except that their cones were large, and probably in most cases with two kinds of spores, and their leaves were also often very long, thus bearing a due proportion to the trees which they clothed. Their thick stems required, however, more strength than is necessary in their diminutive successors, and to meet this want some remarkable structures were introduced similar to those now found only in the stems of plants of higher rank. The cells and vessels of all plants consist of thin walls of woody matter, enclosing the sap and other contents of these sacs and tubes, and when strength is required it is obtained by lining their interior with successive coats of the hardest form of woody matter, usually known as lignin. But while the walls remain thin, they afford free passage to the sap to nourish every part. If thickened all over, they would become impervious to sap, and therefore unsuited to one of their most important functions. These two ends of strength and permeability are secured by partial linings of lignin, leaving portions of