

sisted of long slender cones or spikes, having whorls of scales bearing the spore-cases. Some authors speak of *Asterophyllites* as only branches and leaves of *Calamites*; but though at first sight the resemblance is great, a close inspection shows that the leaves of *Asterophyllites* have a true midrib, which is wanting in *Calamites*.

*Genus ANNULARIA*.—It is perhaps questionable whether these plants should be separated from *Asterophyllites*. The distinction is that they produce branches in pairs, and that their whorls of leaves are one-sided and usually broader than those of *Asterophyllites*, and united into a ring at their insertion on the stem. One little species, *A. sphenophylloides*, is very widely distributed.

*PINNULARIA*—a provisional genus—includes slender roots or stems branching in a pinnate manner, and somewhat irregularly. They are very abundant in the coal shales, and were probably not independent plants, but aquatic roots belonging to some of the plants last mentioned. The probability of this is farther increased by their resemblance in miniature to the roots of *Calamites*. They are always flattened, but seem originally to have been round, with a slender thread-like axis of scalariform vessels, enclosed in a soft, smooth, cellular bark.

*Family RHIZOCARPEÆ; Genus SPHENOPHYLLUM.*

Leaves in whorls, wedge-shaped, with forking veins. Fructification on spikes, with verticils of sporocarps. These plants are by some regarded as allied to the *Calamiteæ* and *Asterophylliteæ*, by others as a high grade of Rhizocarps of the type of *Marsilia*. The stem had a star-shaped central bundle of scalariform or reticulato-scalariform vessels.

*Genus SPORANGITES. (Sporocarpon, Williamson.)*

Under this name we may provisionally include those rounded spherical bodies found in the coal and its accompanying beds, and also in the Erian, which may be regarded as Macrospores or Sporocarps of *Protosalvinia*, or other Rhizocarpean plants akin to those described above in Chapter III, which see for description.

*Genus PROTOSALVINIA*.—Under this we include sporocarps allied to those of *Salvinia*, as described in Chapter III.

*Family FILICES.*

Under this head I shall merely refer to a few groups of special interest, and to the provisional arrangement adopted for the fronds of ferns when destitute of fructification.