

The external appearances of trunks of tree-ferns have been already referred to.

With respect to tree ferns, the oldest known examples are those from the Middle Devonian of New York and Ohio, which I have described in the "Journal of the Geological Society," 1871 and 1881. As these are of some interest, I have reproduced their descriptions in a note appended to Chapter III, which see.

The other forms most frequently occurring in the Carboniferous are *Caulopteris*, *Palæopteris*, and *Megaphyton*.\* Stems showing merely masses of aerial roots are known by the name *Psaronius*.

With reference to the classification of Palæozoic ferns, this has hitherto been quite arbitrary, being based on mere form and venation of fronds, but much advance has recently been made in the knowledge of their fructification, warranting a more definite attempt at classification. The following are provisional genera usually adopted :

1. *Cyclopteris*, Brongniart.—Leaflets more or less rounded or wedge-shaped, without midrib, the nerves spreading from the point of attachment. This group includes a great variety of fronds evidently of different genera, were their fructification known; and some of them probably portions of fronds, the other parts of which may be in the next genus.

2. *Neuropteris*, Brongniart.—Fronds pinnate, and with the leaflets narrowed at the base; midrib often not distinct, and disappearing toward the apex. Nervures equal, and rising at an acute angle. Ferns of this type are among the most abundant in the coal-formation.

3. *Odontopteris*, Brongniart.—In these the frond is pinnate, and the leaflets are attached by their whole base, with the nerves either proceeding wholly from the base, or in part from an indistinct midrib, which soon divides into nervures.

4. *Dictyopteris*, Gutbier.—This is a beautiful style of fern, with leaflets resembling those of *Neuropteris*, but the veins arranged in a network of oval spaces. Only a few species are known in the coal-formation.

5. *Lonchopteris*, Brongniart.—Ferns with netted veins like the above, but with a distinct midrib, and the leaflets attached by the whole base. Of this, also, we can boast but few species.

6. *Sphenopteris*, Brongniart.—These are elegant ferns, very numerous in species, and most difficult to discriminate. Their most

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\* See my "Acadian Geology," also below.