

texture, present in slices of coal, may incline an observer, not having large experience in the examination of coals, to overrate their importance; and this I think has been done by most microscopists, especially those who have confined their attention to slices prepared by the lapidary. One must also bear in mind the danger arising from mistaking concretionary accumulations of bituminous matter for sporangia. In sections of the bituminous shales accompanying the Devonian coal above mentioned, there are many rounded yellow spots, which on examination prove to be the spaces in the epidermis of *Psilophyton* through which the vessels passing to the leaves were emitted. To these considerations I would add the following, condensed from the paper above referred to (p. 139), in which the whole question of the origin of coal is fully discussed :*

1. The mineral charcoal or 'mother coal' is obviously woody tissue and fibres of bark, the structure of the varieties of which, and the plants to which it probably belongs, I have discussed in the paper above mentioned.

2. The coarser layers of coal show under the microscope a confused mass of fragments of vegetable matter belonging to various descriptions of plants, and including, but not usually in large quantities, sporangites.

3. The more brilliant layers of the coal are seen, when separated by thin laminæ of clay, to have on their surfaces the markings of *Sigillariæ* and other trees, of which they evidently represent flattened specimens, or rather the bark of such specimens. Under the microscope, when their structures are preserved, these layers show cortical tissues more abundantly than any others.

4. Some thin layers of coal consist mainly of flattened layers of leaves of *Cordaites* or *Pychnophyllum*.

5. The *Stigmaria* underclays and the stumps of

* See also "Acadian Geology," 2d ed., pp. 138, 461, 493.