

common and widely diffused Carboniferous species, some of which have extended to the Permian period in Europe as well. From the upper beds, characterised by these and a few other species, there is a gradual passage downward into the productive coal-measures, and a gradually increasing number of true coal-formation species.

It is worthy of remark here that the association in the Permo-Carboniferous of numerous trunks of *Dadoxylon* with the branches of *Walchia* and with fruits of the character of *Trigonocarpa*, seems to show that these were parts of one and the same plant.

This formation represents the Upper Barren Measures of West Virginia, which are well described by Fontaine and White,* and the reasons which these authors adduce for considering the latter equivalent to the European Permian will apply to the more northern and eastern deposits as well, though these have afforded fewer species of plants, and are apparently less fully developed.

(2) *Coal-formation Sub-Flora :*

The Middle or Productive Coal-formation, containing all the beds of coal which are mined in Nova Scotia and Cape Breton, is the headquarters of the Carboniferous flora. From this formation I have catalogued † one hundred and thirty-five species of plants; but, as several of these are founded on imperfect specimens, the number of actual species may be estimated at one hundred and twenty. Of these more than one half are species common to Europe and America. No less than nineteen species are *Sigillariæ*, and about the same number are *Lepidodendra*. About fifty are ferns and thirteen are *Calamites*, *Asterophyllites*, and *Sphenophylla*. The great abundance and number of species of *Sigillariæ*, *Lepidodendra*, and ferns are characteristic of this sub-flora; and among the ferns certain species of *Neuropteris*, *Pecopteris*, *Alethopteris*, and *Sphenopteris* greatly preponderate.

These beds are the equivalents of the Middle Coal-measures, or Productive Coal-measures of Pennsylvania, Ohio, &c., and of the coal-formation proper of various European countries. Very many of the species are common to Nova Scotia and Pennsylvania; but in proceeding westward the number of identical species seems to diminish.

* "Report on the Permian Flora of Western Virginia and South Pennsylvania," 1880.

† "Acadian Geology," and "Report on Flora of Lower Carboniferous," 1873.