

several rocks to be grey sandstone 2, red and brown sandstone 4, shales 2, or a still greater proportion of red sandstone as compared with Pictou. All this accords with the idea of a gradual increase of red beds in approaching the summit of the formation, so that the upper Coal-formation passes in its upper part into beds having more the aspect of some parts of the Lower Dyas or Permian. No true dolomite is present in these beds; but Dr. Harrington's analyses show that some of the thin beds of concretionary limestone are highly magnesian, and the sandstones contain concretions of sulphate of copper, while the fossil trees which abound in them are often mineralized with sulphates of copper and iron, and sulphate of baryta.

#### *Fossils of the Upper Coal-formation.*

Fossils are by no means so abundant in the Upper as in the Middle Coal-formation, and they are chiefly vegetable. One of the most characteristic plants is *Dadoxylon materiarium*, a species with simple medullary rays, drifted trunks of which abound in a calcified or silicified condition in the sandstones. The fine specimens of the *Sternbergia* pith of this species which I described in 1857\* and 1871† are from this formation. In the upper beds leafy branches of the genus *Walchia* are common fossils, probably belonging to trees of the genus *Dadoxylon*, the only pines which accompany them. *Calamites* are also abundant, especially *C. Suckovii* and *C. Cistii*; and *Calamodendron approximatum* is not uncommon, while *Calamites gigas* occurs rarely in the upper part. *Annularia sphenophylloides* is a characteristic plant in the lower part, and *Cordaites simplex* is very abundant in some beds. *Lepidodendra* are rare, and represented principally by a species which is identical with, or very near to *L. pictoense*. Among ferns the most abundant species are *Pecopteris arborescens* and a variety of *Alethopteris nervosa*. *Stigmaria* and *Sigillaria* are much less frequent even in the lower part than in the Middle Coal-formation, and have not yet been recognized in the upper part.

The following tabular view may serve as a summary of the flora of the Upper Coal-formation as at present known. The first two columns represent the upper and lower parts of the Upper Coal-formation in Nova Scotia; and the third column represents that of Prince-Edward Island. Of the species all but about ten, or more than three fourths, have been found in the Middle Coal-formation also. It will be observed that the number of species, which in all is much smaller than that in the Middle Coal-formation, becomes rapidly reduced in the upper part, and that there is a considerable similarity between the upper series in Nova Scotia and that in Prince-Edward Island. This is further noticeable in the great prevalence of specimens of *Dadoxylon materiarium*, *Walchia*, *Cordaites simplex*, and *Pecopteris arborescens* in this part of the formation in both districts.

\* Proc. Amer. Association, 1857, Canad. Nat. vol. ii.

† Report on Prince-Edward Island.