

and more elevated portions of the old red sandstone, was maintained through all the subsequent epochs to the most recent chalk formations; amid the peculiar characteristics exhibited in the vegetable forms contained in the coal measures, there is, however, a strikingly-marked prevalence of the same families, if not of the same species,* in all parts of the earth as it then existed, as in New Holland, Canada, Greenland, and Melville Island.

The vegetation of the primitive period exhibits forms which, from their simultaneous affinity with several families of the present world, testify that many intermediate links must have become extinct in the scale of organic development. Thus, for example, to mention only two instances, we would notice the *Lepidodendra*, which, according to Lindley, occupy a place between the *Coniferæ* and the *Lycopodiaceæ*,† and the *Araucariæ* and pines, which exhibit some peculiarities in the union of their vascular bundles. Even if we limit our consideration to the present world alone, we must regard as highly important the discovery of *Cycadeæ* and *Coniferæ* side by side with *Sagenariæ* and *Lepidodendra* in the ancient coal measures. The *Coniferæ* are not only allied to *Cupuliferæ* and *Betulinæ*, with which we find them associated in lignite formations, but also with *Lycopodiaceæ*. The family of the sago-like *Cycadeæ* approaches most nearly to palms in its external appearance, while these plants are specially allied to *Coniferæ* in respect to the structure of their blossoms and seed.‡ Where many beds of coal are superposed over one another, the families and species are not always blended, being most frequently grouped together in separate genera; *Lycopodiaceæ* and certain ferns being alone found in one bed, and *Stigmaria* and *Sigillaria* in another. In order to give some idea of the luxuriance of the vegetation of the primitive world, and of the immense masses of vegetable matter which was doubtlessly accumulated in currents and converted in a moist condition into coal,§ I would instance the Saarbrücker coal measures,

* Adolphe Brongniart, *Prodrome d'une Hist. des Végétaux Fossiles*, p. 179; Buckland, *Geology*, p. 479; Endlicher and Unger, *Grundzüge der Botanik*, 1843, s. 455.

† "By means of *Lepidodendron*, a better passage is established from flowering to flowerless plants than by either *Equisetum* or *Cycas*, or any other known genus."—Lindley and Hutton, *Fossil Flora*, vol. ii., p. 53.

‡ Kunth, *Anordnung der Pflanzenfamilien*, in his *Handb. der Botanik*, s. 307 und 314.

§ That coal has not been formed from vegetable fibers charred by