

Wianamatta shale, with *Palæoniscus antipodens* Eg., but without *Glossopteris* and other lower species; the beds are probably Triassic and Jurassic. Jurassic Ganoids of the genera *Coccolepis*, *Leptolepis*, and others, have been reported by A. Smith Woodward (1890), from specimens discovered by C. S. Wilkinson and R. Etheridge, Jr. Both the *Glossopteris* and *Lepidodendron* floras occur in Victoria, and the former in Queensland.

South Africa has a coast border of gneiss and other schists, and inside of it a belt of Paleozoic rocks with Carboniferous at top (in Table Mountain, etc.). The great interior region thus bordered is occupied by the "Karoo formation" from Table Mountain northward over Orange Free State and Basutoland, reaching the coast only to the southeast in Caffraria. It includes (1) the Ecca beds (with the Dwyka boulder bed [glacial?] in the lower part), which contain *Glossopteris*, etc., and are regarded as Permian, or of the age of the Tálchir and Damúda beds of India; (2) the Middle Karoo, or Beaufort beds, Permian or Triassic; and (3) the Upper Karoo or Stormberg beds, supposed to be Triassic. For a colored geological map by A. Schenk, see *Peterm. Mittheil.*, 1888.

LIFE OF THE SUBCARBONIFEROUS AND CARBONIFEROUS PERIODS.

PLANTS.—The same genera of plants, with few exceptions, are represented among the European coal-beds as occur in America; and about a third of the American species are found also in Europe. In this respect the vegetable and animal kingdoms are in strong contrast; for the species of animals common to the two continents have always been few.

The number of species in the European flora of the Carboniferous (the British included) is stated to be nearly 1400, while North America, so far as described, including the Carboniferous and Subcarboniferous periods, has afforded, as enumerated by Lesquereux in the concluding part of his Pennsylvania Report of 1884, excluding fruits, about 625 species, and including fruits, nearly 800. Over 200 species of the 625 exist also in Europe. The number of species of the several genera common to the two continents is given by Lesquereux as follows:—

Calamites, 11; *Asterophyllites*, 6; *Annularia*, 6; *Sphenophyllum*, 8; *Macrostachya*, 1; *Neuropteris*, 17; *Odontopteris*, 5; *Dictyopteris*, 3; *Callipteridium*, 3; *Alethopteris*, 6; *Pseudoplectopteris*, 16; *Pecopteris*, 29; *Oligocarpia*, 1 (*O. Gutbieri*); *Sphenopteris*, 20; *Eremopteris*, 2; *Rhacophyllum*, 7; *Stemmatopteris*, 1; *Caulopteris*, 1; *Megaphyton*, 1; *Lepidodendron*, 14; *Ulodendron*, 4; *Knorria*, 3; *Halonina*, 3; *Cyclostigma*, 1; *Lepidophloios*, 3; *Lepidophyllum*, 1; *Sigillaria*, 25; *Syringodendron*, 3; *Stigmara*, 1; *Cordaites*, 1.

The flora of the Subcarboniferous of Europe includes species of *Archæopteris*, *Sphenopteris*, *Lepidodendron* (as *L. Veltheimianum*, *L. squamosum*); *Knorria* (*K. imbricata*, *K. acicularis*); *Bornia transitionis*, *Asterophyllites elegans*, *Stigmara ficoides*. The flora of the Middle and Lower coal is much like the American. The Upper coal contains *Sigillariæ*, but rarely a *Lepidodendron*; species of *Calamites*, *Calamodendron*, and *Annularia* are common, the *Annularia* becoming rare above; species also of *Pecopteris*, *Callipteris*, *Neuropteris*, and *Odontopteris*, are common, but not of *Sphenopteris*. *Cordaites* also is common. With these occur species of true Cycads, and of *Walchia* (*W. piniformis*), a Conifer.

Among the Diatoms observed by Castracani in the coal of England, the following 8 species are now living: *Fragillaria Harrisoni* Sm., *Epithemia gibba* Ehr., *Sphenella glacialis* Ktz., *Gomphonema capitatum* Ehr., *Nitschea curvula* Ktz., *Cymbella Scotica* Tm., *Synedra vitrea* Ktz., *Diatoma vulgare* Bory.