tioned agree more nearly with the plants of the carboniferous era than any other, and would therefore imply a warm and humid atmosphere entirely free from intense cold throughout the year.

This absence or great scarcity of plants as well as of freshwater shells and other indications of neighbouring land, coupled with the wide extent of marine strata of this age in Europe and North America, are facts which imply such a state of physical geography so far at least as regards the northern hemisphere) as would, according to the principles before explained, give rise to such a climate. (See p. 110. and Plate 2. Fig. 1.)

Carboniferous group.— This group comes next in the order of succession: and one of its principal members, the mountain limestone, was evidently a marine formation, as is shown by the shells and corals which it contains. That the ocean of that period was of considerable extent in our latitudes, we may infer from the continuity of these calcareous strata over large areas in Europe, Canada, and the United States. The same group has also been traced in North America, towards the borders of the arctic sea.*

The coal itself is admitted to be of vegetable origin, and the numerous well authenticated examples of upright fossil trees still standing where they grew, and the state of the plants, with the beautiful preservation of their leaves in the accompanying shales, precludes, as before stated, the idea of their having been floated from great distances. The majority of the species were evidently terrestrial; and even if coal originated from drifted plants, we must suppose that dry land was not far distant. This opinion is confirmed by the shells and entomostraca found in the upper coal-measures in Shropshire†, where the organic remains indicate a lacustrine deposit. A limestone containing similar fossils at Burdiehouse, near Edinburgh, also implies the former existence of a lake, or rather, perhaps, in this instance, of an estuary, at the remote period under consideration.‡

In part of the coal-field of Northumberland and Durham, fossil shells of a species of Unio, or a closely allied genus, are abundant in a shale containing plants of the carboniferous period, and overlying a bed of coal. The coal has been worked out from beneath the shells, which have been already proved to extend over an area five thousand feet square. The shelly stratum is about eighteen inches thick; and the animals have evidently died at various ages, the shells being of

* It appears from the observations of Sir J. Richardson, made during the expedition under the command of Sir J. Franklin to the north-west coast of America, and from the specimens presented by him to the Geological Society of London, that, between the parallels of 60° and 70° north latitude, there is a great calcareous formation, stretching towards the mouth of the Mackenzie river, in which are included corallines, productæ, terebratulæ, &c., having a close affinity in generic character to those of our mountain limestone, of which the group has been considered the equivalent. There is also in the same region a newer series of strata, in which are shales with impressions of ferns, lepidodendrons, and other vegetables, and also ammonites.— *Proceedings of Geol. Soc.* No. 7. p. 68. *March*, 1828.

† Murchison's Silurian System, p. 84.

‡ Hibbert, Trans. R. S. Edin. vol. xiii.; and L. Horner, Edin. New Phil. Journ., April, 1836.