

every size. Such an accumulation of bivalves of one species, and of a form like the unio, seems clearly to indicate the continuance on the spot of a body of fresh water, such as might be found in the estuary of a river.*

There are also several regions in Scotland, and in the central and northern parts of England, where the marine mountain limestone alternates with strata containing coal, in such a manner as to imply the drifting down of plants by rivers into the sea, and the alternate occupation of the same space by fresh and salt water.

The land of the carboniferous period appears to have consisted in part of granitic rocks, the waste of which may have produced such coarse sandstones as the millstone-grit. Volcanic rocks, however, were not wanting, as for example, in Fife and other parts of Scotland, where they were poured out on the bottom of the sea, or ejected so as to form tuff during the accumulation of the carboniferous strata.

The arrangement of the sandstones and shales in this group has been thought by some geologists, as by MM. Sternberg, Boué, and Adolphe Brongniart, to favour the hypothesis of the strata having resulted from the waste of small islands placed in rows, and forming the highest points of submarine mountain chains. The disintegration of such clusters of islands might produce around and between them detached deposits, which, when subsequently raised above the waters, would resemble the strata formed in a chain of lakes; for the boundary heights of such apparent lake-basins would be formed of the rocks once constituting the islands, and they might still continue after their elevation, to preserve their relative superiority of height, and to surround the newer strata on several sides.†

This idea is also confirmed by the opinion of many botanists, who have studied with care the vegetation of the carboniferous period, and who declare that it possesses the character of an insular flora, such as might be looked for in islands scattered through a wide ocean in a warm and humid climate.

Since the time of the earlier writers, no strata have been more extensively investigated, both in Europe and North America, than those of the ancient carboniferous group, and the progress of science has led to a general belief that a large portion of the purest coal has been formed, not, as was once imagined, by vegetable matter floated from a distance, but by plants which grew on the spot, and somewhat in the manner of peat on the spaces now covered by the beds of coal. The former existence of land in some of these spaces has been proved, as already stated, by the occurrence of numerous upright fossil trees, with their roots terminating downwards in seams of coal.

As some continuous beds of coal have of late years been traced in North America, over areas 100 or 200 miles and upwards in dia-

* Fossil Flora by Lindley and Hutton, part 10.

† See some ingenious speculations to this effect, in the work of M. Ad. Brong-

niart, *Consid. Générales sur la Nat. de la Végét. &c.*, Ann. des Sci. Nat. Nov. 1828.