

of Britain. They contain land-plants and also many marine fossils, some of which are common Carboniferous forms. They thus indicate a transition into the geographical conditions of the Carboniferous period, as is still more clearly illustrated by the corresponding strata in Scotland.

The Old Red Sandstone attains a great development in the south and southwest of Ireland. The thick "Dingle-Beds" and "Glengariff grits" pass down into Upper Silurian strata, and no doubt represent the Lower Old Red Sandstone of Scotland. They are succeeded in Kerry by red sandstones which cover them unconformably, and resemble the ordinary Upper Old Red Sandstone of Scotland. In Cork and the southeast of Ireland they are followed by the pale sandstones and shaly flagstones known as the "Kiltorcan beds," with apparently a perfect conformability. The Kiltorcan beds (which pass up conformably into the Carboniferous Slate) have yielded a few fishes (*Bothriolepis*, *Cocosteus*, *Pterichthys*, *Glyptolepis*), some crustaceans (*Belinurus*, *Pterygotus*), a fresh-water lamellibranch (*Anodonta Jukesii*), and a number of ferns and other land-plants (*Palæopteris*, *Sphenopteris*, *Sagenaria* (*Cyclostigma*), *Knorria*).¹⁷³

Norway, etc.—On the continent of Europe the Old Red Sandstone type can hardly be said to occur. Some outliers of red sandstone and conglomerate (p. 1324) in northern and western Norway reach a thickness of 1000 to 1200 feet. Near Christiania, they follow the Silurian strata like the Old Red Sandstone, but as yet have yielded no fossils, so that, as they pass up into no younger formation, their geological horizon cannot be certainly fixed. The Devonian rocks of Russia have been above referred to as presenting a union of the two types of this part of the geological series. The extension of the land of the Old Red Sandstone period, with its characteristic flora, far north within the Arctic Circle is indicated by the discoveries made at Bear Island (lat. 70° 30' N.) between the coast of Norway and Spitzbergen. Certain seams of coal and coaly shale occur at that locality, underlying beds of Carboniferous Lime-

¹⁷³ Prof. Hull, *Q. J. Geol. Soc.* xxxv. xxxvi.; *Trans. Roy. Dublin Soc.* (new ser.) i. p. 135, 1880; *Explanations of the Geol. Survey, Ireland*, sheets 167, etc., 187, etc.; J. Nolan, *Q. J. Geol. Soc.* 1880, p. 529; Kinahan, *Trans. Geol. Soc. Edin.* 1882, p. 152. A recent personal examination has convinced me that the south of Ireland formed another of the basins in which the Lower Old Red Sandstone was accumulated.