

Ireland marine shells of living British species occur at heights of 1300 feet above the sea. But, for the reason already assigned, the submergence may not have been nearly so great as these high-lying shelly deposits might be supposed to indicate.

1. Lower boulder-clay—a stiff clayey deposit stuck full of ice-worn blocks, and equivalent to the till of Scotland. On the east coast of England (Holderness, Lincoln and Norfolk) it contains fragments of Scandinavian rocks; in particular, gneiss, mica-schist, quartzite, granite, syenite, rhombenporphyr; also pieces of red and black flint, probably from Denmark, and of Carboniferous limestone and sandstone, which have doubtless travelled from the north. Along the Norfolk cliffs it presents stratified intercalations of gravel and sand, which have been extraordinarily contorted. As in Scotland, the true lower boulder-clay in the north of England and Ireland is often arranged in parallel ridges or drums in the prevalent line of ice-movement. As above mentioned, the “crag” of Bridlington, Yorkshire, is probably a fragment of an old marine glacial shell-bearing clay, torn up and imbedded in the boulder-clay of the first ice-sheet. Its shells are strikingly Arctic.

The southern limit of the ice has been already mentioned (p. 1683). No “terminal moraine” has been observed, the ground to the south of the ice-limit being free from glaciation, though erratic blocks, probably brought by drift-ice, are found on the Sussex coast. The Coombe-rock has been already referred to (p. 1711). Deep superficial accumulations of rotted rock occur where the rock has decomposed *in situ* in the southern non-glaciated region, as may be well seen over the Palæozoic slates and granites of Devon and Cornwall. In the non-glaciated chalk districts, a thick cover of flints and red earth partly represents the insoluble parts of the chalk that remain after prolonged subaerial decay, but from the frequent presence of fragments of quartz, which does not occur in the chalk, this mantle of “clay with flints” seems to indicate also a certain amount of transport, though the agent by which this was effected is not obvious. The high moorlands of eastern Yorkshire appear to have