

west face of the Cheviots might be adduced, where Upper Old Red Sandstone and Carboniferous strata rest on an ancient platform of Silurian and Lower Old Red Sandstone volcanic rocks. South of Jedburgh, there are isolated hills carved out of Lower Old Red Sandstone lavas at the close of that period, which are now restored by the partial removal of Upper Old Red strata that once enveloped them.

The evidence now adduced, in brief outline, reveals the extensive denudation of the ancient Silurian tableland during various geological periods, and the behaviour of the Triassic sediments indicates that mesozoic strata entered into the structure of the Southern Uplands and of the Midland Valley at the time of the initiation of the river systems during the Tertiary period.

GLACIATION OF SCOTLAND

In the preceding section, dealing with the evolution of the topography of the country, reference has been made to the fact that in pre-glacial time Scotland stood at a higher elevation above the sea-level than it does at present. Mining operations in the basins of the Forth and Clyde have conclusively shown that coal-seams have been worked up to the margins of pre-glacial river-channels now filled with various superficial deposits. For example, the bottom of one of these ancient river courses at Grangemouth is 240 feet below present sea-level.

But in Scotland no deposits of later Tertiary time have yet been detected which might throw light on the changes that preceded the advent of the Ice Age. In England, however, valuable evidence is supplied by the later Tertiary formations. The older Pliocene deposits on the Norfolk coast, which are all of marine origin, were laid down at some distance from land, in a warm temperate sea. On the other hand, the Newer Pliocene strata indicate a gradual refrigeration of climate. Professor James Geikie and Mr Clement Reid have shown that the land and fresh-water mollusca of the lower part of the Red Crag are mainly of South European types, while those of the higher zones from the Upper Red Crag to the Weybourn Crag present a more northern facies. It is evident, therefore, that during these stages the seas of East Anglia must have been connected with the Arctic Ocean, and that the North Sea may have been occupied by an Arctic fauna. These facts point to the submergence of the Continental Shelf and the severance of Britain from Scandinavia across the plain of the North Sea.

The succeeding Cromer Forest Bed, consisting of a series of estuarine and lacustrine strata laid down under temperate conditions, points to a greater extension of land surface than now prevails,