

of the raised beach at Gamrie in Banffshire ; and in it the arctic shells last appear. And to the greatly-extended sub-arctic period in Scotland there belong a class of appearances which have been adduced in support of a *glacial* as opposed to an *iceberg* theory. But there is in reality no antagonism in the case. After examining not a few of our Highland glens, especially those on the north-western coast of the country, I have arrived at the conviction, that Scotland had at one time its glaciers, which, like those of Iceland, descended along its valleys, from its inland heights, to the sea. And as in most cases certain well-marked accompaniments of the true glacier, such as those lateral and transverse moraines of detached rock and gravel that accumulate along their sides and at their lower terminations, are wanting in Scotland, it is inferred that great currents must have swept over the country since the period of their existence, and either washed their moraines away, or so altered their character and appearance that they can be no longer recognised *as* moraines. Of course, this sweeping process might have taken place during that period of profound subsidence when the boulder-clay was formed, and in a posterior period of more partial subsidence, which is held to have taken place at a later time and under milder climatal conditions, and which is said to have brought down the land to its present level from a considerably higher one. In many localities there rests over the true boulder-clay an argillaceous or gravelly deposit, in which the masses and fragments of rock are usually angular, and which, even where the boulder-clay is shell-bearing, contains no shells. There are other localities in which a similar deposit also *underlies* the boulder-clay ; and these deposits, upper and lower, are in all probability the *débris* of glaciers that existed in our country during the ice-era,—the lower deposit being the *débris* of glaciers that had existed previous to the glacial period of subsidence, and the upper that of glaciers which had existed