

have once filled the valley of the Tummel to the height of the stratified drift, it may have dammed up the mouth of a mountain torrent by a transverse barrier, giving rise to a deep pond, in which beds of clay and sand brought down by the waters of the torrent were deposited. Charpentier in his work on the Swiss glaciers has described many such receptacles of stratified matter now in progress, and due to such blockages, and he has pointed out the remnants of ancient and similar formations left by extinct glaciers of an earlier epoch. He specially notices that angular stones of various dimensions, often polished and striated, which rest on the glacier and are let fall when the torrent undermines the side of the moving ice, descend into the small lake and become interstratified with the gravel and fine sediment brought down by the torrent into the same.\*

The evidence of the former sojourn of the sea upon the land after the commencement of the glacial period was formerly inferred from the height to which erratic blocks derived from distant regions could be traced, besides the want of conformity in the glacial furrows to the present contours of many of the valleys. Some of these phenomena may now, as we have seen, be accounted for by assuming that there was once a crust of ice resembling that now covering Greenland.

The Grampians in Forfarshire and in Perthshire are from 3,000 to 4,000 feet high. To the southward lies the broad and deep valley of Strathmore, and to the south of this again rise the Sidlaw Hills to the height of 1,500 feet and upwards. On the highest summits of this chain, formed of sandstone and shale, and at various elevations, I have observed huge angular fragments of mica-schist, some three and others fifteen feet in diameter, which have been conveyed for a distance of at least fifteen miles from the nearest Grampian rocks from which they could have been detached.

\* Charpentier, *Essai sur les Glaciers*, p. 63, 1841.