accounting more easily for the temporary existence and entire disappearance of lofty transverse barriers, although the height required for the imaginary dams of ice may be startling.

Before the idea last alluded to had been entertained, Mr. Darwin examined Glen Roy, and came to the opinion that the shelves were formed when the glens were still arms of the sea, and consequently, that there never were any seaward barriers. According to him, the land emerged during a slow and uniform upward movement, like that now experienced throughout a large part of Sweden and Finland; but there were certain pauses in the upheaving process, at which times the waters of the sea remained stationary for so many centuries as to allow of the accumulation of an extraordinary quantity of detrital matter, and the excavation, at many points immediately above, of deep notches and bare cliffs in the hard and solid rock.

The phenomena which are most difficult to reconcile with this theory are, first, the abrupt cessation of the roads at certain points in the different glens; secondly, their unequal number in different valleys connecting with each other, there being three, for example, in Glen Roy and only one in Glen Spean; thirdly, the precise horizontality of level maintained by the same shelf over a space many leagues in length requiring us to assume, that during a rise of 1250 feet no one portion of the land was raised even a few yards above another; fourthly, the coincidence of level already alluded to of each shelf with a *col*, or the point forming the head of two glens, from which the rain-waters flow in opposite directions. This last-mentioned feature in the physical geography of Lochaber seems to have been explained in a satisfactory manner by Mr. Darwin. He calls these *cols* "landstraits," and regards them as having been anciently sounds or channels between islands. He points out that there is a tendency in such sounds to be silted up, and always the more so in proportion to their narrowness. In a chart of the Falkland Islands by Capt. Sullivan, R. N., it appears that there are several examples there of straits where the soundings diminish regularly towards the narrowest part. One is so nearly dry that it can be walked over at low water, and another, no longer covered by the sea, is supposed to have recently dried up in consequence of a small alteration in the relative level of sea and land. "Similar straits," observes Mr. Chambers, "hovering, in character, between sea and land, and which may be called fords, are met with in the Hebrides. Such, for example, is the passage dividing the islands of Lewis and Harris, and that between North Uist and Benbecula, both of which would undoubtedly appear as *cols*, coinciding with a terrace or raised beach, all round the islands, if the sea were to subside."*

The first of the difficulties above alluded to, namely, the non-extension of the shelves over certain parts of the glens, may be explained, as Mr. Darwin suggests, by supposing in certain places a quick growth of green turf on a good soil, which prevented the rain from washing away any loose materials lying on the surface. But wherever the soil was barren, and where green sward took long to form, there may have been time for the removal of

* "Ancient Sea Margins," p. 114, by R. Chambers.