

rapidly to the west that its direct action might not reach such summits.

Nor would I exclude altogether the action of glaciers in eastern America, though I must dissent from any view which would assign to them the principal agency in our glacial phenomena. Under a condition of the continent in which only its higher peaks were above the water, the air would be so moist, and the temperature so low, that permanent ice may have clung about mountains in the temperate latitudes. The striation itself shows that there must have been extensive glaciers as now in the extreme Arctic regions. Yet I think that most of the alleged instances must be founded on error, and that old sea-beaches have been mistaken for moraines. I have failed to find even in the White Mountains any distinct sign of glacier action, though the action of the ocean-breakers is visible almost to their summits; and though I have observed in Canada and Nova Scotia many old sea-beaches, gravel-ridges, and lake-margins, I have seen nothing that could fairly be regarded as the work of glaciers. The so-called moraines, in so far as my observation extends, are more probably shingle beaches and bars, old coast-lines loaded with boulders, trains of boulders or "ozars." Most of them convey to my mind the impression of ice-action along a slowly subsiding coast, forming successive deposits of stones in the shallow water, and burying them in clay and smaller stones as the depth increased. These deposits were again modified during emergence, when the old ridges were sometimes bared by denudation, and new ones heaped up.

I shall close these remarks, perhaps already too tedious, by a mere reference to the alleged prevalence of lake-basins and fiords in high northern latitudes, as connected with glacial action. In reasoning on this, it seems to be overlooked that the prevalence of disturbed and metamorphic rocks over wide areas in the north is one element in the matter. Again, cold Arctic currents are the cutters of basins, not the warm surface-currents. Further, the fiords on coasts, like the deep lateral valleys of mountains, are evidences of the action of the waves rather than of that of ice. I am sure that this is the case with the numerous indentations of the coast of Nova Scotia, which are cut into the softer and more shattered bands of rock, and show, in raised beaches and gravel ridges like those of the present coast, the levels of the sea at the time of their formation.