

the higher summits at intervals, even as far south as New Mexico. Again, there were isolated glacier regions along the Cascade Range and the Sierra Nevada, about Rainier, St. Helens, Hood, Shasta, Lyell, and other summits; and in the Great Basin, on Jeff Davis Peak, the East Humboldt Range, Shoshone Range, and West Humboldt Range. Shrunken relics of the old glaciers still linger about the Wind River Mountains in Wyoming; on Mount Lyell and Mount Dana in the Sierra Nevada; and on Shasta, Rainier, and other summits of the Pacific coast region.

East of the summit range of the Rocky Mountains in British America, the limit between the eastern drift, or that from the region east of Lake Winnipeg, and the western, or that of the mountains beyond, has the position shown by the dotted line on the map, Fig. 1548, the height being 3000 to 3700 feet above sea level.

There was also a *northern limit* to glaciation in northwestern America, according to G. M. Dawson. The line crossed the plateau region of British Columbia, between 60° and 64° N., and consequently *Alaska was uncovered* — a fact confirmed by the more recent observations of Dall and Russell. Greenland had probably no more ice than now.

The details on the map (Fig. 1548) with reference to the moraines from the Mississippi to New Jersey have been obtained chiefly from published and unpublished notes of Chamberlin and Leverett; those over Iowa and Minnesota, from W. Upham; those about the Coteau des Prairies, from I. E. Todd; and those farther north, from G. M. Dawson; for the position of the southern ice-limit, or Moraine line A, from H. C. Lewis, Report Z; *The Terminal Moraine in Pennsylvania*, 1884, from G. F. Wright; for the line westward to the Mississippi, Lewis's Report Z, and also Wright's *Ice Age*, etc.; for the positions of the glacial lakes of Manitoba, from W. Upham; those of the lakes of the Great Basin, from G. K. Gilbert and I. C. Russell; for the glacial striæ over New England, from C. H. Hitchcock mainly; and those of other regions from Chamberlin's map, *7th Ann. Rep. U. S. G. S.*, and other sources.

*Condition outside of the Ice-limit. Forced migration.* — South of the Ice-limit, the precipitation was probably as heavy as to the north of it. But it made only deep snows about the Appalachians and other low mountains, and contributed water abundantly to rivers and lakes. Over a narrow belt near the front, there would have been marshes and ponds with Arctic vegetation, and cold-climate Mammals, which had been driven southward.

Several of the emigrant plants still remain and thrive on the summits of the mountains of both eastern and western North America. Thirty-seven species, according to Asa Gray, occur on the White Mountains of New Hampshire, and part of them also on the Adirondacks and Green Mountains. Out of 27 species observed by the Jensen expedition on a Greenland Nunatak in 1878, the White Mountain flora includes, according to Gray, the Grasses *Luzula hyperborea* and *Trisetum subspicatum*, the Sorrel, *Oxyria digyna*, the Moss-like Heath, *Cassiope hypnoides*, and the Moss-like Catchfly, *Silene acaulis*. *Sedum rhodiola*, a subalpine species, occurs on cliffs of the Delaware, below Easton, Pa.; *Saxifraga oppositifolia* Linn., on Mount Willoughby,