

scratches, and fine striæ, running in a determinate line across the smoothed surfaces of the rocks. They look like what might be artificially produced by pushing sand, gravel, and stones, under enormous pressure, along a polished plane of rock. And there cannot be any doubt that it was really by the attrition of such materials that the scratches were made, and that the pressure and onward movement were given by the vast overlying bed of ice. Similar dressings are familiar features of the rocks in Alpine valleys, where the trend of the striæ runs in the same line as the valley—that is, of course, in the direction in which the glacier has moved.

The water which percolates through the numerous joints and fissures of a rocky cliff and freezes there in winter, widens by its expansion the crevices it occupies. This operation being often repeated, there comes at last a time when the wedges of ice have so effectually sundered a mass from its parent cliff that it falls headlong into the valley. Should a glacier occupy the bottom of the valley below, the loosened rocks gather in heaps on the surface of the ice. Once there, they are slowly and steadily carried down the valley until—unless some rent in the ice should swallow them up by the way—they are thrown down at the end of the glacier, perhaps many leagues from the cliffs whence they originally came. In high northern latitudes the glaciers, instead of melting far in the interior of the country, as those of the Alps do, actually push their way out to sea, and break off in vast masses, which float away seaward as icebergs. It is clear that, if the surface of the glacier has been cumbered with boulders and rocky rubbish in the inland glens, it will carry this burden with it as it moves down to the sea-level; and the masses of ice which break off from the end of the glacier will, in like manner,