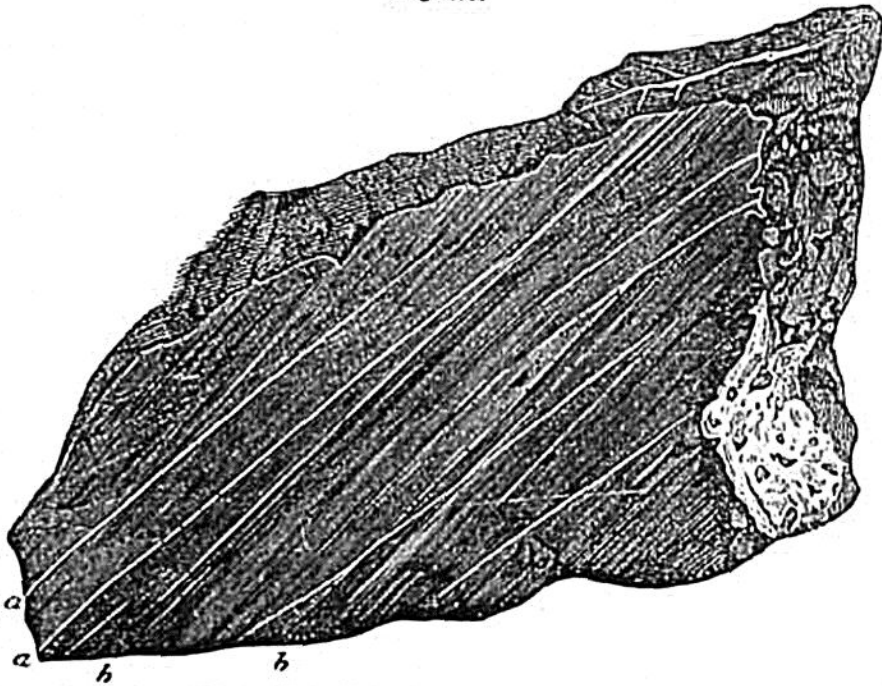


These stones themselves also are often furrowed and scratched on more than one side.

In explanation of such phenomena I may refer the student to what was said of the action of glaciers and icebergs in the Principles of Geology (ch. xv.). It is ascertained that hard stones, frozen into a moving mass of ice, and pushed along under the pressure of that mass, scoop out long rectilinear furrows or grooves parallel to each other on the subjacent solid rock. (See fig. 109.) Smaller scratches and striæ are made on

Fig. 109.



Limestone polished, furrowed, and scratched by the glacier of Rosenlaur, in Switzerland. (Agassiz)

- a a.* White streaks or scratches, caused by small grains of flint frozen into the ice.
b b. Furrows.

the polished surface by crystals or projecting edges of the hardest minerals, just as a diamond cuts glass. The recent polishing and striation of limestone by coast-ice carrying boulders even as far south as the coast of Denmark, has been observed by Dr. Forchhammer, and helps us to conceive how large icebergs, running aground on the bed of the sea, may produce similar furrows on a grander scale. An account was given so long ago as the year 1822, by Scoresby, of icebergs seen by him drifting along in latitudes 69° and 70° N., which rose above the surface from 100 to 200 feet, and measured from a few yards to a mile in circumference. Many of them were loaded with beds of earth and rock, of such thickness that the weight was conjectured to be from 50,000 to 100,000 tons.* A similar transportation of rocks is known to be in progress in the southern hemisphere, where boulders included in ice are far more frequent than in the north. One of these icebergs was encountered in 1839, in mid-ocean, in the antarctic regions, many hundred miles from any known land, sailing northwards, with a large erratic block firmly

* Voyages in 1822, p. 233.