

year, the line of permanent snow extended itself southward. Probably the volume of snowy precipitation was increased, and thus the march of the reign of snow, was accelerated.

The sheet of perpetual snow, to whatever limit it reached, was divided into two areas by an isothermal line. Had the sun never exerted a thawing influence—had no thawing ever taken place in any portion of the snow, it would have remained a soft and fleecy covering. But wherever incipient thawing was felt, the snow crystals began to resolve themselves into grains of ice. Down to the latitude where this change was unable to proceed farther, the condition of the snow remained granular, as it now does in the Alps. If however, the melting influence proceeded farther, the granular snow-mass resolved itself into solid ice. These changes can be traced in the snow which falls upon our streets. Thus all the southern portion of the snow-field became a true glacier; north of that was a zone of *névé*; and possibly a zone of soft snow covered the area still nearer the pole. All this, of course, supposes precipitation to have taken place. If in any region, precipitation was wanting or scant, the snowy or icy covering did not appear.

On its northern border, the glacier was fixed to the mass of ice or *névé* beyond; and very probably it was fixed to the earth. The glacier, like all glaciers, must move; and the motion would be developed along the free border. The glacier, therefore, traveled southward. Consider the consequences of the motion. The soft snow had filled the gorges and the river valleys. It had settled around cliff and crag, and when it became ice, it held them in its firm grasp. The motion of the glacier wrenched fragments from their fastenings and moved them southward. The rock fragments, like diamonds in a setting, marked and scored the underlying surface. The loose materials, the accumulation of a previous geologic æon, were plowed to the bed-rock. The bed-rock was scored and striated by the tremendous power of the glacier.

Every year, the great ice-sheet encroached a little farther