

successively through a series of phases characterized by different densities; it becomes, in the first place, *glace bulleuse* (enclosing air-bubbles, *bulles*); then *white granular ice*; and, finally, *compact blue ice*, which latter forms the substance of the glaciers.

In the Alps there falls about 60 feet of snow yearly, which is equivalent to a stratum of ice two yards thick.

In those lofty regions, the solar heat is powerless to melt such a quantity of solid water; consequently, every year a residuum or *stock* of ice is left, which composes the nucleus or kernel of the glaciers. Heaped up, one upon another, these annual layers would eventually gather into considerable mountains, had not far-seeing nature guarded against such a contingency by the progressive movement of which we have spoken, and which is nothing more than the slow, continuous

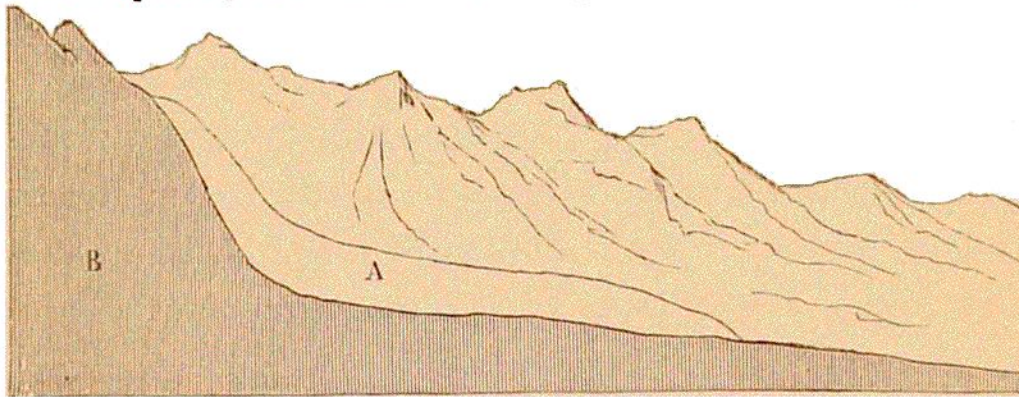


FIG. 99.—GLACIER OF THE FIRST RANK.

descent of these enormous masses on the inclined plane of the mountain. And by degrees, as they descend, they are eaten away at the base by the warm temperature of the valleys.

Saussure has divided them into *glaciers of the first and second rank*.

Those of the *first rank* descend from the loftiest chains, and fill up the higher valleys; their surface is sometimes nearly horizontal; and they are then named *Mers de Glace* (seas of ice). Such is the *Mer de Glace* of the Mont Blanc chain. There are some of these ice-seas 22,000 to 28,000 yards in length—larger than not a few of the Cumbrian lakes. Their base descends to an altitude of 6100 or 3900 feet.

The *glaciers of the second rank* do not descend into the valleys;