within 500 to 1500 feet of the bottom. It was intraglacial,[1] as now in Greenland; there was in general no *superglacial* drift over the ice-sheet. The local exceptions to this occur over the melting lower margin; for a short distance about some "Nunatak" (page 240), where local melting had favored the growth of alpine Algæ; and in regions reached by the dust of the drifting winds. Even the stones and gravel, taken up from the bottom over which the ice moved, might have been carried upward along oblique planes of bedding or lamination into the ice-mass.

A paragraph from the chapter on Glaciers (page 246) is here repeated because of its apparent importance in connection with the accumulation, transportation, and deposition of the drift.

The slipping of the ice along planes of bedding or straticulation like that of the blue bands has been shown by Forel to be a fact in several glaciers, among them the Bossons Glacier at Chamouni. In the lower part of a glacier these planes have a *dip upstream*; and as a consequence, the mass of the glacier, as it moves down the valley, rises by slipping along one or more of the planes of lamellar structure. Forel observes that the fact explains the difference of velocity between the upper and lower beds of the ice; the little movement at the extremity of a glacier; the reappearance, at the surface, of bodies buried in the interior of the glacier; and the preservation of the thickness of the ice at the lower extremity, notwithstanding the annual loss from melting. The cause must have great influence over the direction of crevasses, and in all adjustments to resistances. He states further that at the Glacier of Hochsbalm, a frontal moraine was formed in 1884, by the slipping of a bed of clean ice over an old bed of debris-covered ice. (*Arch. Phys. Nat. Genève*, 1889, xxii., 276, and *Am. Jour. Sc.*, 1889, xxxviii., 412.)

Besides taking up material for transportation, the glacier pushed along bowlders and gravel wherever its mass rested, and especially where there was a rocky surface at shallow depth below for it to slip over; and the loose material gathered, besides serving for abrasion, made a prominent part of the ground-moraine here and there in progress of accumulation.

The uneasy glacier stream — uneasy because forced to make unceasingly new adjustments to the uneven surface underneath it — carried on the work of *corrasion* among the transported stones with vastly greater force than running water, because the ice had a firm hold on the stones and was plied by pressure of vast amount. It was a wonderfully efficient rock-mill. The stones, hard or soft, had their angles and surfaces rounded, and then were gradually reduced to sand, earth, and rock-flour. Owing to this wearing out of the stones, the drift in any region seldom contained stones gathered from points more remote than the last fifty miles of travel. Shaler states that the stones and bowlders on Nantucket were all gathered by the ice east of Narragansett Bay.

It is not surprising that, in Illinois, Indiana, and Iowa, where the distance of travel from any good gathering-place was great, stones in the drift should be few, and be almost confined to the hardest kinds, as those of chert; that the southern ice-limit should in some parts have no well-defined moraine;

[1] The term *englacial*, used by some writers, is not here adopted because it is *half* Greek. *Intraglacial* accords with Latin usage.