

of the Atlantic, and in given directions. The natural course of oceanic currents transporting ice from polar regions is from N.E. to S.W.; the westerly inclination being due to the influence of the increased velocity of the diurnal rotation of the earth's surface as we proceed southward. Now it is a well-known fact, and one of great geological interest, which I had an opportunity of verifying myself in 1842,* that in Canada the polished surfaces of hard rocks exhibit those striæ and straight parallel grooves (such as are generally ascribed to glacial action) in a N.E. and S.W. direction, and the blocks called erratic have also traveled from N.E. to S.W. Their course, therefore, agrees, as Mr. Redfield has pointed out, with the normal direction of polar currents charged with ice, where no disturbing causes have intervened. In order to account for the phenomenon, we have to suppose that Canada was submerged at the time when the rocks were polished and striated by the grating of the ice on the ancient sea-bottom; and that this was actually the case, is proved by independent evidence, namely, the occurrence of marine shells of recent species at various heights above the level of the sea in the region drained by the St. Lawrence.† Professor Hitchcock has shown that, in Massachusetts, there is another system of striæ and grooves running from N.N.E. to S.S.W.; the boulders and transported blocks of the same region having taken a corresponding course, doubtless, in consequence of the floating icebergs having, in that case, been made by winds or currents, or the shape of the land and sea-bottom, to deviate from the normal direction.

Many of the icebergs annually drifted into southern latitudes in the Atlantic, are covered with seals, which are thus brought into very uncongenial climates, and probably are never able to make their way back again. They are often seen playing about the rocks on the shores of Massachusetts in summer, so that they seem able, for a time at least, to accommodate themselves to considerable heat.

Early on the morning of the 15th of September, the captain

* See "Lyell's Travels in North America," vol. ii. p. 135.

† Ibid. vol. ii. p. 143.