and position before the drift and erratics accumulated on and in them, and before the surface of the fixed rocks was polished and furrowed. I have the less hesitation in ascribing the transporting power to coast-ice, because I saw, in 1852, an angular block of sandstone, eight feet in diameter, which had been brought down several miles by ice, only three years before, to the mouth of the Petitcodiac estuary, in Nova Scotia, where it joins the Bay of Fundy; and I ascertained that on the shores of the same bay, at the South Joggins, in the year 1850, much larger blocks had been removed by coast-ice, and after they had floated half a mile, had been dropped in salt water by the side of a pier built for loading vessels with coal, so that it was necessary at low tide to blast these huge ice-borne rocks with gunpowder, in order that the vessels might be able to draw up alongside the pier. These recent exemplifications of the vast carrying powers of ice occurred in lat. 46° N. (corresponding to that of Bordeaux), in a bay never invaded by icebergs.

I may here remark that a sheet of ice of moderate thickness, if it extend over a wide area, may suffice to buoy up the largest erratics which fall upon it. The size of these will depend, not on the intensity of the cold, but on the manner in which the rock is jointed, and the consequent dimensions of the blocks into which it splits, when falling from an undermined cliff.

When I first endeavoured in the 'Principles of Geology,' in 1830,* to explain the causes, both of the warmer and colder climates, which have at former periods prevailed on the globe, I referred to successive variations in the height and position of the land, and its extent relatively to the sea in polar and equatorial latitudes—also to fluctuations in the course of oceanic currents and other geographical conditions,

* 1st edit. ch. vii.; 9th edit. ib.