

loses 69,000 cubic metres of solid rock every year, or a cubic mass measuring 41 metres on the side.²⁴⁸ There is some difficulty, however, in determining what proportion of the sediment may have been washed in below the ice by streams issuing from springs and melted snows. Estimates of the work done by glaciers, so far as based upon the amount of sediment discharged by them, may consequently be rather over the truth.

§ 6. Oceanic Waters

The area, depth, temperature, density, and composition of the sea having been already treated of (Book II.), we have now to consider its place among the dynamical agents in geology. In this relation it may be studied under two aspects: 1st, its movements, and 2d, its geological work.

I. **Movements.**—(1) *Tides.*—These oscillations of the mass of the oceanic waters, caused by the attraction of the sun and moon, require notice here only as regards their geological bearings. They are scarcely perceptible in inclosed seas, such as the Mediterranean and Black Seas, which are commonly spoken of as tideless. In strictness, however, a feeble but quite recognizable tide may be observed in the Mediterranean. On the coast of the Alpes Maritimes it has a mean rise of 6 to 8 inches, the least rise being 4 and the highest not exceeding 10 inches. The Mediterranean tides are most strongly developed in the Bay of Gibraltar (where they rise from 5 feet to 6 feet 6 inches), the upper Adriatic, and the Gulf of Gabes. At Brindisi the rise is 8 inches, at Ancona 1 foot 4 inches, at Venice 1 foot 8 inches, and at Trieste 2 feet 4 inches. With a rise of the barometer the level of the water falls sometimes a fourth lower than the limit of the normal ebb. Observations at Nice, Monaco, Cannes,

²⁴⁸ Geol. Fören. Stockholm Förhandl. 1874, No. 21, Band ii. No. 7.