

have these ramparts about parts of their shores ; as at the north part of Willoughby Lake, at Averill and Franklin ponds.

As this phenomenon has no connection with glaciers or drift, we venture to propose a theory for it here. We think that the bowlders composing the ramparts have been brought from the bottoms of the lakes, and pushed upon the shore by the outward expansion of the water in freezing. Instances are on record where large stones of tons weight have been moved several feet in a single season. And if a few inches progress only be made in a single winter, a hundred winters might witness the removal of all the blocks in shallow water to the shore, and the crowding of them into a ridge having the form of a rampart. A similar phenomenon on the shores of Lake Onega, in Russia, is described by Sir Roderick Murchison, and explained in an analogous manner.

AGENCY OF THE OCEAN.

The ocean produces geological changes in three modes : 1. By its waves ; 2. By its tides ; 3. By its currents. Their effect is twofold : 1. To wear away the land ; 2. To accumulate detritus so as to form new land.

The action of waves or breakers upon abrupt coasts, composed of rather soft materials, is very powerful in wearing them down, and preparing the detritus to be carried into the ocean by tides and currents. During storms, masses of rocks, weighing from ten to thirty tons, are torn from the ledges, and driven several rods inland, even up a surface sloping with a considerable dip towards the ocean.

In the 13th century, a strait half as wide as the channel between England and France, was excavated in 100 years in the north part of Holland ; but its width afterwards did not increase. The English channel also is supposed to have been formed in a similar manner. In England, several villages have entirely disappeared by the encroachments of the sea. At Cape May, on the north side of Delaware Bay, the sea has advanced upon the land at the rate of about 9 feet in a year ; and at Sullivan's Island, near Charleston, South Carolina, it advanced a quarter of a mile in three years. But perhaps the coast of Nova Scotia and New England exhibits the most striking examples of the powerful wasting agency of the waves, whose force there is often tremendous, especially during violent northeast storms. Where the coast is rocky, insulated masses of rocks, called *Drongs*, are left on the shore, giving a wild and picturesque effect to the scenery, as in the following sketch, Fig. 88, which was taken upon Jewell's Island, in Casco Bay, Maine.