

Caspian Seas, and Lake Superior, tides are scarcely perceptible; never exceeding a few inches; and in the open ocean they are very small; not exceeding two or three feet; but in narrow bays, estuaries, and friths, favorably situated for accumulating the waters, the tides rise from 10 to 40 feet; and in one instance even 60 or 70 feet on the European coasts; and in the Bay of Fundy, in Nova Scotia, 70 feet. In such cases, especially where wind and tide conspire, the effect is considerable upon limited portions of coast, both in wearing away and filling up.

When tides enter rivers, the water is forced to rise suddenly, in consequence of the contraction of the channel. This produces a wave as high as the tide, called "the Bore," which rushes up the channel with great rapidity, and acts powerfully as a denuding agent. Upon Calcutta river, it is called the "*Eagre*," and its approach is much dreaded by ship owners.

*Earthquake Waves*, or Waves of Translation, are powerful agents of erosion. They constitute one of the phenomena of earthquakes. Their effects are unusually disastrous, because the water itself is moved along bodily. They have been known to attain the height of sixty feet, and to move at the rate of twenty miles in a minute. One of these huge waves rose and fell eighteen times upon the coast of Africa in 1755.

#### OCEANIC CURRENTS.

Oceanic currents are produced chiefly by winds. Modern researches have revealed the existence of a great number of these ocean rivers. The most extensive of them is the Gulf Stream. An equatorial current from the Southern Atlantic empties into the Caribbean sea, receiving the waters of the Amazon and Orinoco on its way, and is thus a feeder of the Gulf Stream. It properly commences in the Gulf of Mexico, whence it issues by the Strait of Florida, and one part of it stretches northeasterly, passing along the coast of the Atlantic States, and extending beyond Norway and Spitzbergen; it is common to find tropical fruits and pieces of wood transported by this current from the West Indies to the Hebrides. The other branch passes from Florida across the Atlantic towards Madeira, uniting with a current down the west coast of Africa. This is a warm current, but is divided into alternate warm and cold portions. Its velocity is variable; but may be stated as from one to three and even four miles per hour; its mean rate being 1.5 mile. Its velocity decreases towards the northeastern extremity. Return currents originate about the North Pole, or come through Behring's Straits, and pass south, partly through Baffin's Bay, and partly east of Greenland, uniting on the Labrador coast and passing along the coast of British America and the United States to Florida. The latter is a cold current. In the Indian and Pacific Oceans there