

out 50 feet high. In the North Atlantic the maximum about 40 feet. Vaughan Cornish (*Waves of the Sea*), during a strong gale in December, 1900, measured waves 29 feet high, and some of 43 feet. The height upon the "fetch," i.e. the width of open water to which the wind blows; if the fetch is more than 39 miles the height of waves (H) in feet is one and a half times the square root of the fetch (D), i.e. $H = 1.5\sqrt{D}$; if the fetch is less than 39 miles $H = 1.5(2.5 - 4\sqrt{D})$. The heights of waves, and the formulas, are as follows:—

Wave Height.	Fetch.	Wave Height.	Fetch.	Wave Height.
3 ft.	30 miles = 8 ft. 4 in.	100 miles = 15 ft.		
5 ft. 6 in.	40 " = 9 ft. 5 in.	200 " = 21 ft. 5 in.		
7 ft. 1 in.	50 " = 10 ft. 6 in.	300 " = 26 ft.		

Waves in Lake Geneva are 8 feet high where they have a fetch of 40 miles, those on Lake Superior 20-25 feet high where the fetch is of over 300 miles.

The length of disturbance of a wave is equal to its length; the maximum length of ordinary waves in the Atlantic is about 100 miles and they disturb fine sediment to the depth of about 100 fathoms. The action diminishes rapidly with depth. The displacement of water particles at a depth equal to the length of the wave is only $\frac{1}{333}$ and at double the length is only $\frac{1}{3330}$ of that of the surface. At special gales and currents move material far below the limit of wave action. Lobster pots in the English Channel are sometimes filled with coarse shingle at the depth of 200 feet. Seaweeds which live not less than 200 feet below the surface have been torn from the sea-floor by waves. The telegraph cables are cut by drifting sand at the depth of 100 fathoms, and silt is moved at greater depths.

The transport of beach material depends on the angle at which waves strike the shore. A wave which rushes obliquely along the beach returns by the shorter steeper course at right angles to the shore; it carries material along a zigzag course. The wash may be concentrated and strike a more powerful than the oncoming wave; thus at Dunbar a wave

