to have an altitude of forty degrees of the quadrant, while the cloud itself extended over head and all round to a very considerable distance. Allowing then from the ship a base of a little more than one third of a nautical mile, say 2050 feet, and an angle of 40° to the top of the neck, we shall then have for the perpendicular height of the spout about 1720 feet, or very nearly one third of a statute mile. A little before it burst, two other water-spouts of an inferior size were observed to the southward, but their continuance was of short duration.

If Captain Napier's calculation of the height of this water-spout be even an approximation to the truth, it entirely destroys that theory which attributes the phenomenon to the formation of a vacuum. Liquids will rise in exhausted tubes to the height at which they exactly balance a column of atmospheric air having the same base, and water obeying this law will rise to the height of about thirty-two feet, as it does in pumps. Now, if this force acts at all in the formation of water-spouts, it must be aided by some other agent, but what that is cannot be determined in the present state of our knowledge upon the subject; it may be a result of an electrical attraction dependant on the different electric conditions of the cloud and the ascending fluid, or may be produced by the rotary motion of the air.

MOTION OF THE SEA.

The sea is subject to a motion of three different kinds: it is agitated by the action of the wind, producing waves; by tides, which result from the attractive influence of the moon; and by currents, produced under various circumstances, and resulting from a variety of causes. To all these we must briefly refer.

WAVES.

Waves necessarily result from the laws which govern fluids. Whenever the level of a liquid is disturbed, there will always be an effort to restore the equilibrium, and a mass of fluid will rush to occupy the place which has been vacated. The wind, acting upon the surface of the sea, piles up, if we may so speak, ridges of water, leaving small narrow indentations, into which the water on all sides attempts to enter. This disturbance, therefore, is communi-