

Fig. 90.



WAVES AND TIDES.

The effects of waves upon shores is very great. Those of the ordinary size will form wave ridges, or *ripple marks*, at the depth of 70 feet, upon a sandy bottom; and in violent gales the bottom may be disturbed at the depth of 400 feet.

A boulder containing more than 200 cubic feet was hurried up an acclivity to the distance of 150 feet, upon one of the British islands. Near Edinburgh it was ascertained, by careful experiment, that the average force exerted by waves in summer was 611 pounds every square foot; and in the winter 2,086 pounds for every square foot. At the Bell Rock Lighthouse, in the German Ocean, during a violent storm, the pressure exerted was nearly three tons to every square foot. When we reflect that the weight of bodies in water is but little more than half their weight in air, we shall see that great effects may be caused even by ordinary waves.

In large inland bodies of water, such as the Mediterranean, Black and