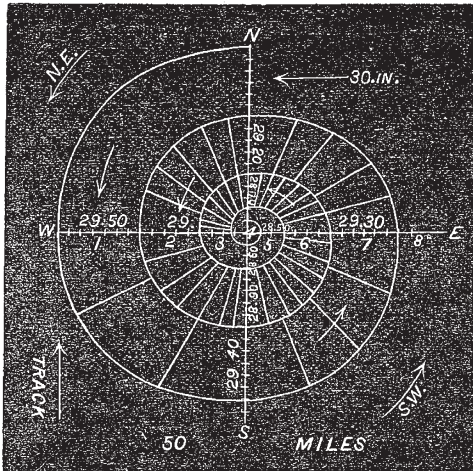


helix, and therefore if the water be driven in at the large end and up to the small end of the spiral, it should considerably increase in height as it went along and move with greater rapidity.

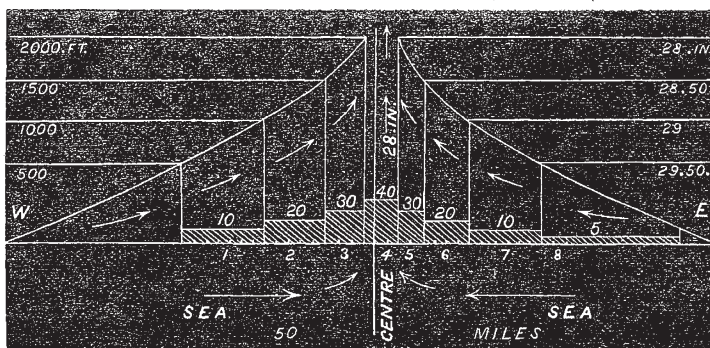
When arrived at the extremity of the spiral, it may be considered to remain there for some time and spread itself out laterally in bulk at the high level as long as the violence of the storm lasted. But when the force of the wind began to diminish, this heaped aqueous mass would more or less suddenly subside,



Cyclone—Horizontal Plan.

and rush down on all sides to seek its natural level. This might occur at sea, and be evidenced by the long swell or rollers frequently seen, or might be translated by progressive motion to launch its tremendous weight on the land, and inundate it. This, it may be conjectured, could only be effected over lands about the level of the sea, over which the base of the funnel of the cyclone would advance, carrying the inclosed mass of water with it for part of the area of the revolving circle, which would so far be still able to draw its supplies from the sea on the coast yet included in its motion. As soon, however, as the southern or equatorial limb of the circle had so far progressed as to leave the sea behind it, then the friction of the earth would prevent the inclosed mass of water following the cyclone, which had been already cut off from its aqueous communication, and it would be left behind to expand over and deluge the country lying under its level.

In speculating on the dimensions of the Bengal storm-wave we may assume, from the statements in the newspapers, that it was a disc of fifty miles in diameter and twenty feet deep, when viewed



{Cyclone—Vertical Section.

as a frustrum of a cylinder, which might also represent, when in a state of gyration, a cone of the same diameter and forty feet high in the centre. The contents of this space would amount to about, in bulk, 1,094,785,668,000 cubic feet, representing a weight of 70,339,979,169,000 lbs of sea-water, which would have flooded over a perfectly level district of a disc of about 700 miles in diameter, or 39,270 square feet in area to the depth of one foot horizontally.

The means for counteracting the disastrous effects of the storm or cyclone-wave in the Delta of the Ganges on life and property, would probably be found in the erection of *mounds*, as proposed by a writer in the *Times*. As this tract of country would be destitute of stone or rock, and be composed chiefly of mud and sand, it would be requisite to convert this into *bricks* first, as the mud-mounds would not stand the impact of the storm-waves, even in this country.

The design for the construction of these mounds would probably be most suitable after the model of the celebrated *Tower of Babel*, projected by the post-Diluvial inhabitants of Mesopotamia for a like purpose of self-preservation from inundation.

VORTEX

“Polar Cyclones”—Etna Observatory

In reply to Mr. Clement Ley's letter in NATURE, vol. xv. p. 253, I fear I cannot at all agree with him as to the cause of the polar depressions of the barometer. He says: “The ‘polar cyclones’ appear to be themselves aggregates of those local depressions, or cyclones, which have penetrated into the Arctic or Antarctic regions, and have there partially or wholly coalesced.” Now, let us test the question in this way:—Suppose the surface of our planet were all land, so that there was no watery vapour in the atmosphere; there would be no cyclonic storms, for they are due to what Espy truly calls steam power;—would the polar depressions of the barometer be observed as they are in our actual atmosphere? Mr. Clement Ley's reasoning seems to require him to say that they would not; I have no doubt that they would. The causes which produce the west winds of the middle latitudes (Maury's “counter-trades”) would act as in our actual atmosphere, and their centrifugal force, in rotating round the poles, would produce a space of shallow atmosphere at and around each pole, exactly like the depression at the centre of a vortex of water, which would show itself, as at present, by a depression of the barometer.

I see in NATURE of the same date that it is proposed to form a meteorological observatory on Etna. I hope the opportunity may be taken of obtaining what is one of the greatest desiderata in the present state of meteorology—I mean a set of comparative observations of the barometer taken at two neighbouring stations, one at the sea-level, and the other at a great height. One such set, continuous or taken at short intervals, extending over a few years, and accompanied by observations of temperature and wind (the latter by self-registering anemometers), would probably give more information on the physics of barometric waves than could be obtained by any amount of observations, all taken at the sea-level. I have urged this in NATURE before, but it is so important I hope I may do so again.

JOSEPH JOHN MURPHY

Old Forge, Dunmurry, Co. Antrim, January 20

The Boomerang

REFERRING to my letter on the “Boomerang” which you were so good as to publish in NATURE, vol. xiv. p. 248, I may, perhaps, be permitted to add a few more statements on the same subject. Concerning the use of the boomerang by the North Gippsland aboriginal natives, I have no more to add, but I have acquired some information in respect to its use among the blackfellows of South Australia, which may be of interest.

My informant is Mr. James, now a senior constable in the Victorian police, but formerly, and when I first became acquainted with him, managing a large cattle station at Blanchewater, on the borders of the so-called Lake Torrens Basin. Mr. James has had great experience among the blacks of that district during many years both before and after the time I first met with him,

during my second expedition into Central Australia. I quote Mr. James's statements to me just as I noted them:— “Among the blacks about Blanchewater the boomerang is made for killing game. It is principally thrown among flocks of ducks, pigeons, and water-hens. It is not used often for fighting nor for killing kangaroo. They might use it in a row when short of weapons, and if their adversaries were not more than twenty or thirty yards distant. The blacks did not