

Tunis, Tripoli (600 feet), Madagascar (400 feet), and the south coast of Australia (300 feet), but these figures need corroboration.

In the desert Pampas of Peru the familiar phenomenon of sand dunes is in evidence. Alongside the railway, inland of Arequipa, the dunes form in serried sequence. They follow the normal horned shape, and in some cases the space between the horns is about 50 yards. The railway track rises about 1 in 100, and the dunes march correspondingly uphill. This rate of march is stated to be about 100 yards per annum. When they reach the hills flanking the desert the sand slope becomes too steep to permit of their further advance. The notable feature in connection with the dunes of this district is the ingenious and simple method by which they are dispersed when threatening to overwhelm the railway. Loose pebbles and grit from the surface of the pampa are scattered in a thin layer over the rear flank of the dune, the result being that ripple action is stayed. The dune assumes an irregular contour, and this affords the wind an opportunity of penetrating through the mass of it and scattering its constituents. The process of disintegration is stated to be fairly rapid, and, when complete, nothing remains but the grit and pebbles lying on the surface of the pampa.¹

The materials for the dunes with which we are concerned are brought by onshore winds from the foreshore. At low tide on sandy shores the top layers of sand become dry and incoherent, and constitute the reserve or depot from which the dunes are built up. The grains of sand are swept along by the wind, the movement being in nature largely a rolling or hopping of the particles from point to point. Where obstacles or inequalities of the ground are encountered, the wind is deflected and the transported sand comes to rest in the tranquil places on the lee side of the obstacles.

In this way miniature sand dunes arise on the lee sides of bunches of drifted seaweed on the tide-mark or of growing plants. The further growth of such dunes is determined by the

¹ "Sand Dunes in the Peruvian Desert" (W. S. Barclay), *Geographical Journal*, Vol. XLIX, No. 1.