

days; when dried they floated more than ninety days, and afterwards germinated. He also alludes to another way in which the sea might indirectly assist in the dispersion of plants.¹ "But seeds may be occasionally transported in another manner. Drift timber is thrown up on most islands, even on those in the midst of the widest oceans; and the natives of the coral islands in the Pacific procure stones for their tools solely from the roots of drifted trees. I find, on examination, that when irregularly-shaped stones are embedded in the roots of trees, small parcels of earth are frequently enclosed in their interstices and behind them—so perfectly, that not a particle could be washed away in the longest transport: out of one small portion of earth thus completely enclosed by wood in an oak about fifty years old, three dicotyledonous plants germinated. I am certain of the accuracy of this observation. Again, I can show that the carcasses of birds, when floating on the sea, sometimes escape being immediately devoured; and seeds of many kinds in the crops of floating birds long retain their vitality. Peas and vetches, for instance, are killed by even a few days' immersion in sea-water; but some taken out of the crop of a pigeon which had floated on artificial salt water for thirty days, to my surprise, nearly all germinated."

Two years later Professor Ch. Martins, of Montpellier, published² an account of some similar experiments tried by him with mostly different kinds of seeds. He first of all noted which of them floated in sea-water; but it is not clear whether the trial was merely momentary or prolonged. However, of ninety-eight kinds of seeds and seed-vessels containing seeds, fifty-nine, we are informed, floated. Instead of plunging them in water, as Darwin and Berkeley did, Martins employed a perforated box, with as many compartments as kinds of seeds, and attached it to a buoy, so that it rose and fell with the waves, and the seeds were thus alternately exposed to the air and water, as they would be if floating free. After forty-five days' exposure the box was opened, when it was found that forty-one kinds of seed out of ninety-eight were rotten. The remaining fifty-seven apparently sound ones were sown, and of these thirty-five germinated; but as sixteen of them were of greater specific gravity than sea-water, they would have to be deducted, leaving only nineteen species out of ninety-eight that might possibly germinate and establish themselves on a coast after floating for six weeks on the surface of the sea. These nineteen species were: *Asclepias cornuti*, *Asphodelus cerasiferus*, *Beta vulgaris*, *Cakile maritima*, *Cucurbita pepo*, *Ephedra distachya*, *Eryngium maritimum*, *Euphorbia paralias*, *Gingko biloba*, *Linum maritimum*, *Nelumbium speciosum*, *Paliurus aculeatus*, *Pancreatium maritimum*, *Ricinus africanus*, *Ricinus communis*,³ *Rumex aquaticus*, *Salsola kali*, *Scabiosa maritima*, and *Xanthium macrocarpum*.

About half of the species, it will be seen, are essentially littoral plants, whose seeds are ordinarily exposed to the influence of sea-water.

¹ *Loc. cit.*, p. 360.

² Bulletin de la Société Botanique de France, iii. p. 324.

³ Really varieties of one species.