

quartz and green schist, some of them 2 or 3 inches in diameter, has justly excited much wonder. If these had been carried to the spots where we now find them by waves or currents from the lands once bordering the cretaceous sea, how happened it that no sand or mud was transported thither at the same time? We cannot conceive such rounded stones to have been drifted like erratic blocks by ice (see ch. x. and xi.), for that would imply a cold climate in the Cretaceous period; a supposition inconsistent with the luxuriant growth of large chambered univalves, numerous corals, and many fish, and other fossils of tropical forms.

Now in Keeling Island, one of those detached masses of coral which rise up in the wide Pacific, Captain Ross found a single fragment of greenstone, where every other particle of matter was calcareous; and Mr. Darwin concludes that it must have come there entangled in the roots of a large tree. He reminds us that Chamisso, the distinguished naturalist who accompanied Kotzebue, affirms, that the inhabitants of the Radack archipelago, a group of lagoon islands in the midst of the Pacific, obtained stones for sharpening their instruments by searching the roots of trees which are cast up on the beach.\*

It may perhaps be objected, that a similar mode of transport cannot have happened in the cretaceous sea, because fossil wood is very rare in the chalk. Nevertheless wood is sometimes met with, and in the same parts of the chalk where the pebbles are found, both in soft stone and in a silicified state in flints. In these cases it has often every appearance of having been floated from a distance, being usually perforated by boring-shells, such as the *Teredo* and *Fistulana*.†

The only other mode of transport which suggests itself is sea-weed. Dr. Beck informs me that in the Lym-Fiord, in Jutland, the *Fucus vesiculosus*, often called kelp, sometimes grows to the height of 10 feet, and the branches rising from a single root form a cluster several feet in diameter. When the bladders are distended, the plant becomes so buoyant as to float up loose stones several inches in diameter, and these are often thrown by the waves high up on the beach. The *Fucus giganteus* of Solander, so common in Terra del Fuego, is said by Captain Cook to attain the length of 360 feet, although the stem is not much thicker than a man's thumb. It is often met with floating at sea, with shells attached, several hundred miles from the spots where it grew. Some of these plants, says Mr. Darwin, were found adhering to large loose stones in the inland channels of Terra del Fuego, during the voyage of the Beagle in 1834; and that so firmly, that the stones were drawn up from the bottom into the boat, although so heavy that they could scarcely be lifted in by one person. Some fossil sea-weeds have been found in the Cretaceous formation, but none, as yet, of large size.

But we must not imagine that because pebbles are so rare in the white

\* Darwin, p. 549. Kotzebue's First Voyage, vol. iii. p. 155.

† Mantell, Geol. of S. E. of England, p. 96.