

the stick, so that it accumulates at the far end of the groove in a small heap. Great care must be taken that this small heap of powder is not shaken or blown away. The friction being kept up slowly and steadily, the sides of the groove begin to blacken and soon to smoke. Rapid strokes are now resorted to, the fine dust rubbed off becomes black like soot, and at last ignites at the end of the stroke just as it is pushed into the small accumulated heap, which acts as tinder. A tiny wreath of smoke ascending from the heap shows that the operation has been successful. A gentle blowing soon sets the whole heap aglow. The operation is excessively tiring to the wrists, since it has to be prolonged for a considerable time, but the greater the practice the less the waste of force. Very few Europeans have been able to get fire by friction in this way with their hands unassisted by mechanical appliances, though Mr. Darwin succeeded at Tahiti, and Dr. Goode, R.N., frequently lighted a candle in this way to show the process on board H.M.S. "Dido" at Fiji. It is easy enough to get smoke and char the wood a little, but very difficult to get the actual fire. The slightest halt during the friction is fatal.

The old stone implements have entirely gone out of use in Tonga, and they are not plentiful. Several were bought from natives who had them put away in their houses. They call them "toki Tonga," Tongan axe, or adze, in distinction to foreign axes, whereas the Sandwich Islanders speak of their adzes as stone adzes "pohaku koi." All the stone adzes seen were unmounted; no doubt the handles had been used long ago, when iron was introduced, to fasten hoop iron blades to in place of the discarded stone ones. The manners and customs of the ancient Tongans are probably better understood than those of any other Polynesian Islanders, because of the existence of Mariner's well-known account of them.¹

The island of Tonga is about 27 miles in extreme length and 10 in extreme breadth, and is entirely composed of coral reef rock, without, as far as is known, any blown sand formation. The sand on the beaches is scanty. The presence of blown sand rock on coral islands must depend on the freedom of some part of the coast from breakwaters of coral, in order that a heavy surf may form sand in abundance. In Bermuda the sand is derived from the unsheltered side of the island. In some rock about 30 feet above sea level were seen, as Dana describes, some Brain Corals imbedded in the position in which they had grown. About the reefs are to be seen curious cylindrical blocks of coral standing on end, and often hollowed out at the top. These arise from the growth of a mass of ordinarily rounded coral until the top reaches the surface of the water or an insufficient depth to allow of further growth. The top of the mass then dies, whilst growth goes on round the sides, and the dead core is hollowed out by decay, and by the subsequent solution of lime by the water. The surface of the rock in Tonga is covered with a reddish soil like that of Bermuda. It is so hidden with soil and vege-

¹ An Account of the Natives of the Tonga Islands, compiled from communications by Mr. W. Mariner, several years resident in those islands, by John Martin, M.D., London, 1817.