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Nuts to the Garden of Eden

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The coconut palm evolved without human assistance. The question is, whether mankind could have evolved without the coconut.

Coconut Evolution

The origin and dispersal of the coconut palm (*Cocos nucifera*) have often been subjects of hot scientific debate—particularly at the time of Thor Heyerdahl's epic voyage by balsawood raft. Heyerdahl favored a theory that held South America to be the home of the coconut palm and he suggested that American Indians had carried coconuts to the Pacific Islands (Heyerdahl, 1952). These ideas have been discounted (Merrill, 1954) but botanists cannot agree where the coconut came from or how far the fruit may spread by floating. The general assumption has been that agricultural selection and propagation have masked the center of origin and the effects of natural dissemination.

The coconut has certainly had a long and close association with man in the humid tropics, where it provides food and drink, fuel and shelter, and a source of income. In fact, this close association and the historically recent development of industrial plantations have obscured, until now, the main points of coconut evolution (Harries, 1978). These can be briefly stated. The coconut probably evolved on coral atolls and newly emerged volcanic islands where there was little risk of destruction by animals or of competition from other plants. It was disseminated by floating and grew naturally on the very narrow strip of beach above the high-water mark where it was not overshadowed by forest trees or choked by undergrowth. It could neither reach inland sites nor survive in them. Larger-fruited forms with thicker husks had a selective advantage, not only because they extended the range of dissemination but because, in competition for the very restricted habitat, they eliminated the smaller-fruited forms. Island hopping from a center of origin (which might have been a region, now submerged, somewhere between Australia, New Zealand and New Caledonia) the coconut spread to islands as far apart as the Seychelles in the Indian Ocean and Palmyra Atoll in the Pacific. The long-fruited, thick-husked coconuts that fringed those islands when they were first discovered can still be found there today. The palm grows as tall as any cultivated variety, carries as many fruit, and these weigh from one to two kg. Floating would also have carried these slow-germinating fruit thousands of kilometers to continental coasts. While the distance to America may have been too great, and the climate of Africa and Australia may have been too dry, the southeast corner of Asia would have been ideal.

There is no need to seek human involvement in the selection or dissemination of this coconut. Indeed, I believe that it was not until the coconut reached the coast of southeast Asia that man's

early ancestor, the apelike *Ramapithecus*, came down from the trees some 12 million years ago. There then began a close relationship from which Man was to emerge. This suggestion is made in all seriousness even though the circumstantial evidence comes from some usual sources: a Victorian military hero who believed he had located the Garden of Eden, an award-winning American space scientist who proposed that dragons really did exist, an Emeritus Professor at Oxford who considers that human evolution passed through an aquatic stage, and a best-selling Welsh authoress who gave the feminist movement some new ideas.

The Garden of Eden, the Forbidden Fruit and the Serpent

In 1881, four years before his death at Khartoum, Charles George Gordon made a reconnaissance of the Seychelles Islands, home of the fabled coco-de-mer palm (*Lodoicea maldivica*). Before 1756, the seed of this palm was thought to have come from a plant growing *beneath* the sea because it was only ever found, partly decomposed, floating in the Indian Ocean or washed up on the shores of the Maldive Islands (hence its specific name). The seed, which is the largest in the world, has a remarkable historical reputation as an aphrodisiac due, as the *Encyclopaedia Britannica* delicately explains, to the impudicity of its shape. Gordon wrote to the Director of the Royal Botanic Gardens, Kew, suggesting that the coco-de-mer was the tree of the Forbidden Fruit and that the Seychelles were therefore the Garden of Eden (Lionnet, 1970). This provoked a botanist to remark that ". . . anyone who has seen the nut complete with husk must admire the serpent's inveiglements the more, if it persuaded Eve to bite into such a tough, fibrous and unpalatable object!" (Jeffrey, 1964). Yet, right now, the modern Eve in a package tour to Paradise (as an hotel in the Seychelles is called) can still be enticed by snake-hipped Lotharios to taste the pink, jelly-like endosperm of the immature coco-de-mer.

Similarly, the hard-shelled mature coconut of commerce would not have appealed to *Ramapithecus*. Not only is it difficult to get at (more about that later) but the hard endosperm, eaten raw in large quantities, is not particularly digestible and the few spoonfuls of water are insipid. As with the coco-de-mer, it is the immature fruit that is desirable. In the coconut each developing fruit may contain up to half a liter of liquid that has a 5% sugar content, a fizz imparted by naturally occurring gases and an agreeable flavor.

I am not the first to see the resemblance between the Tree of Life in the Book of Revelation, ". . . which bare twelve *manner* of fruits, *and* yieldeth her fruit every month" and the coconut (Child, 1974) but I do not go as far as General Gordon, who sought a literal interpretation of the Bible. Perhaps Gordon was making another of his heroic stands. Not, this time, against Rudyard Kipling's "lesser breeds without the Law" but against Thomas Henry Huxley's "agnostic"—by 1881 an entire generation had been brought up with Darwinian evolution as an alternative to Biblical dogmatism. I prefer Carl Sagan's approach. Although he considers Eden a metaphor and Genesis an allegory he, nevertheless, points out that if the Biblical Serpent had to go upon its belly as a punishment for tempting Eve then it must once have had legs. He reminds us that snakes do have rudimentary limbs and suggests that the widespread fear of reptiles and the popularity of the St. George type of myth in

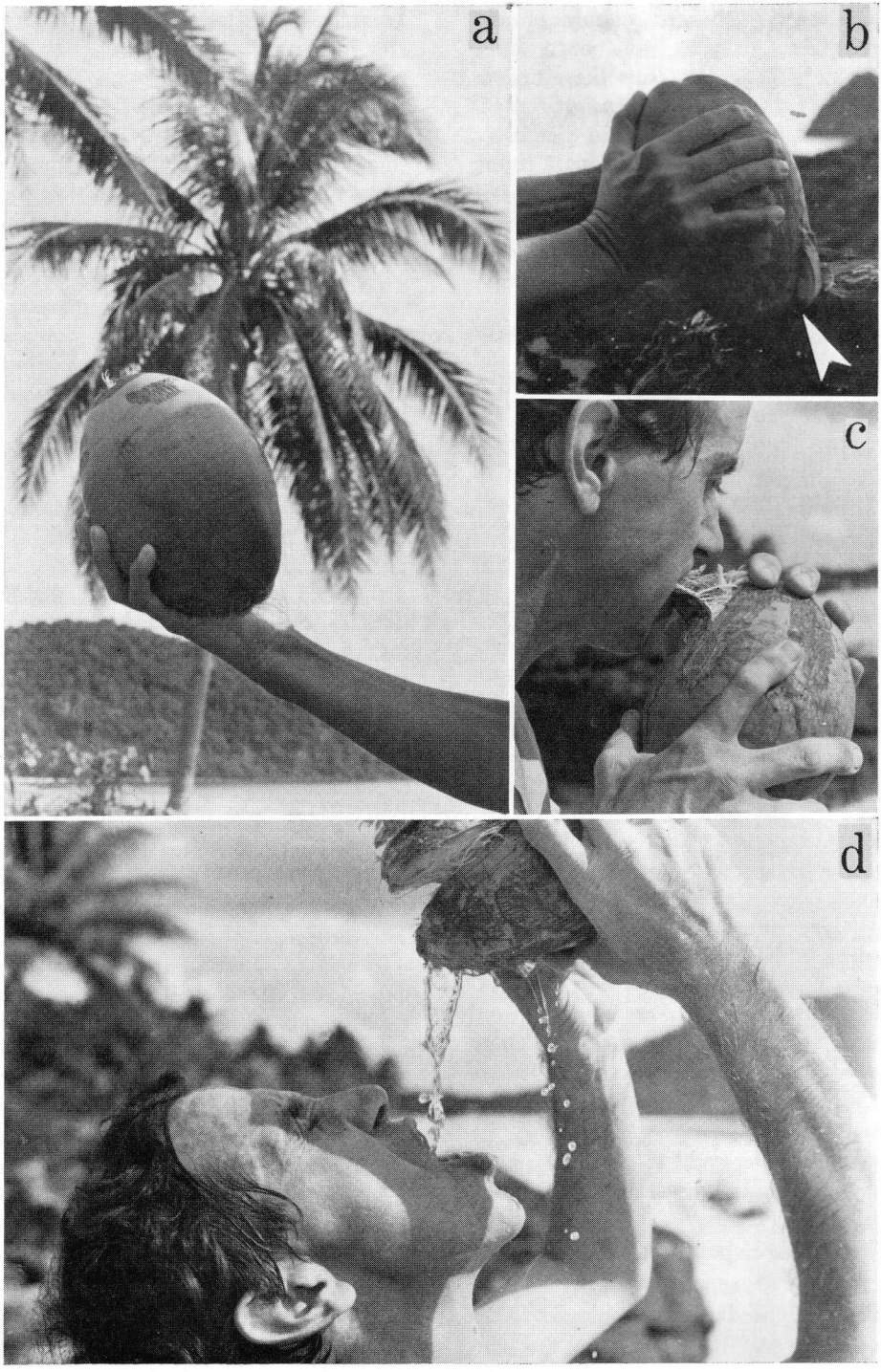
a diversity of human cultures might mean that dragons did once exist (Sagan, 1977). He elects the Komodo dragon (*Varanus komodoensis*), a monitor lizard now found only in the Lesser Sunda Islands of Indonesia, as a living relic.

Adam and Eve Went Down to Bathe

If the coconut palm and the monitor lizard represent the Tree of Life and the Serpent in a southeast Asian Garden of Eden then can we also find Adam and Eve there? Consider *Homo aquaticus*. The possibility that there was an aquatic stage in human evolution, when many hours of each day were spent in the sea, was suggested by Sir Alister Hardy. This unprecedented idea accounts for a number of important human traits: the diving reflex, which controls the flow of blood to the brain and to the heart when the face is immersed in water; the ability of very young babies to swim; the pattern of hairs on an otherwise functionally naked skin; the streamlined shape of the human body; the subcutaneous layer of adipose tissue; and the flexible and sensitive hand and body movements (Hardy, 1960; 1977). Elaine Morgan, dealing with evolution from a woman's point of view, came to similar conclusions and added ideas on reproduction, speech and behavioral responses such as frowning and crying (Morgan, 1972). If Adam and Eve were aquatic then the beaches and shallow seas around the multitude of islands that fringe southeast Asia would have been an Eden-like setting.

The offshore coral reefs and the atolls to which *H. aquaticus* could swim would be free of the dangerous animals found on the larger islands and on the continental coast. Fresh food would be available—shellfish on the shoreline, fish in the sea. One thing alone would seem to be missing—a ready supply of fresh water. If, as Elaine Morgan says, 500 cc of "free" water per day is enough to keep the kidneys of an adult human working then one or two coconuts provide just that quantity of *uncontaminated* water. Moreover, the very act of getting it encourages the development of two more essential human traits that Hardy and Morgan do not satisfactorily account for—the hand with its opposable thumb and the prognathous jaw. As the pictures show (Fig. 1) all that is needed is to grasp the immature coconut fruit, bang it against a conveniently exposed rock on the seashore, tear with the teeth at the loosened fibers of the husk, split the soft shell—and drink. No tools are needed yet the grip that is developed is exactly what is required for wielding wooden clubs or stone implements. Moreover, the immature husk is itself full of sap and, although somewhat bitter, this additional liquid can be extracted by chewing the husk. It may be noted that peeling the fully mature coconut, though a tougher proposition, is by no means impossible and the hard, lignified shell would provide a convenient receptacle if one were needed.

I see no reason why *H. aquaticus* should not have existed and been an evolutionary success. With time, tribes would have spread, going like beachcombers, along coastlines wherever coconuts grew. Large stretches of water would have been barriers so that the Pacific Islands beyond Melanesia and the whole American continent would have been inaccessible. Australia is an interesting case, particularly as recent archeological evidence points to habitation occurring earlier than was once thought possible. The present climate of northern Australia is very dry and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Joseph Birdsell considers that a lack of drinking water would have been a constraint to successful colonization (Birdsell, 1977). Nevertheless, coconuts do grow in Queensland today and during favorable climatic periods in the past both coconut and *H. aquaticus* might have reached Greater Australia, following the island-hopping routes that Birdsell identifies. Elsewhere, coastwise migration during hot and humid periods could have ranged from southern China to India, Sri Lanka, the Middle East Gulf Coast, the east coast of Africa and, perhaps, Madagascar and some islands of the Indian Ocean. Subsequently, cooler or drier times might have isolated groups of *H. aquaticus*, perhaps eliminating them wherever they could not move inland to get fresh water from rivers and lakes if the coastal coconuts failed to thrive (the mean temperature for coconuts to grow successfully must be above 20°C and annual rainfall must not be less than 1,500 mm without prolonged dry spells).

It is tempting to wonder if *H. aquaticus* ever cultivated the coconut palm, thereby making it the first agricultural crop. At first this might amount to no more than guarding bearing palms and self-sown seedlings from other animals. Eventually, there would be unconscious selection for desirable qualities. For instance, there are some coconut palms in which the immature husk is sweet and can be chewed like sugar cane (Child, 1974). These palms are rare, possibly because, with the advent of tool making, coconuts were no longer peeled with the teeth but with a pointed stick and ultimately with a heavy-bladed knife. Perhaps a survey for the presence of the edible-husk character would reveal the extent of the spread of *H. aquaticus*? Another characteristic that has retained its original importance is the quantity of water in the immature nut. Due to selection, the cultivated coconut may have more than twice as much liquid endosperm as the coconut found on uninhabited islands (Harries, 1978).

Epilogue

Perhaps when Adam said, "I heard Thy voice in the garden, and I was afraid, because I was naked . . ." he really meant to say hairless? During glaciations *H. aquaticus* populations would have had to clothe themselves to protect their, by now, hairless and naked bodies from the cold. When they sheltered in caves fossil evidence would accumulate for the palaeontologists. In those fossils that are acknowledged to be in line of descent to man, the powerfully constructed jaws are mute testimony to the need to chew tough and fibrous food. Unfortunately, the Garden of Eden cannot be found in the fossil record. On the seashore of the hot and humid tropics the coconut is eminently disposable and totally recyclable—it is a nonreturnable container par excellence. In acknowledging the importance of the coconut to human evolution it is this very quality that must be commemorated. The coconut was the milk bottle on the doorstep of mankind.

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1. The young coconut fruit (a) can be easily split (b, arrowed) and the husk peeled back (c) to enjoy the sweet drink (d).

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