

The Botswana Society

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In Association with the National Museum and Art Gallery

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The Baobab Tree and Seasonal Hunger in Africa: The Case of the San

by JOHN RASHFORD*

The baobab (*adansonia digitata*) is an enormous African tree which ranks as one of the most bizarre spectacles of the botanical world appreciated for both its singular appearance and its many uses. The various accounts of this tree give the impression that Africans eat the seeds only in times of "scarcity" or "famine", or in what is sometimes referred to as "hard times". These accounts also lead us to believe that a period of "scarcity" or "famine" can occur at any time of the year and that whenever such a time occurs the seeds of the baobab are readily available to be eaten (Uphof 1958:8, Sturtevant 1972:24, Vaid 1978:40, Weiss 1979:40).¹ This is clearly not the case. This paper suggests that "hard times" — a time of "scarcity" or "famine" — should be more precisely defined as a recurrent period of the annual cycle that is associated with scarcity and hunger and that the seeds (like the pulp of the fruit and the leaves) are eaten during this time because this is when they are available and because many people find them palatable.

The point this paper argues is not without some support in the literature. For example, Dalziel (1973:14) tells us in his well known book entitled, *The Useful Plants of West Tropical Africa*, that baobab seeds are "much used as foodstuff" *except* [my emphasis] in East Hausa where "the pounded seeds serve as a famine food, called charon". I would like to suggest that what Dalziel says of West Africa might well be true of Africa in general — baobab seeds are a preferred food for most people, although there are exceptions like East Hausa.

Unfortunately, it is not possible at this time to prove this point one way or another — we still know so little about Africa's most famous tree. This paper focuses on the San people of the Kalahari as an illustration of a group for whom baobabs seeds seem to be a preferred food that is seasonally available at the most difficult time of the year. Here again we are hampered by the lack of specific information and this is unfortunate because the San have been the subject of intense studies over the past twenty years.

Distribution

The African baobab derives its generic name *Adanson* from the French botanist Michel Adanson who encountered the tree while travelling in Senegal from 1749 to 1753. Adanson was a student of Bernard de Jussieu and it was Bernard de Jussieu's report of Adanson's findings that led Linnaeus to mention the tree in his *Species Plantarum* published in 1743. *Digitata*, which is the scientific name of the species, identifies the finger-like leaflets of the baobab's large compound leaves. The African baobab is often described as the "best known" or "the most prominent" member of the genus *Adansonia* of which there are some eight related species that are only known to occur naturally in Madagascar and Australia.

As we move northward, eastward and southward from the wet tropical forest of west and central Africa we encounter Africa's most characteristic feature: a vast savannah that ranges in character from fairly open deciduous woodlands and gallery forest to an environment that includes thickets, scrublands and grasslands without trees or isolated trees. Bordering this extensive and varied savannah

*Department of Sociology and Anthropology, College of Charleston, Charleston.

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is Africa's well known deserts — the Sahara and the Kalahari. The baobab is frequently identified as a symbol of the continent and people of Africa, and, according to Guy (1972:161), it "epitomizes the African savannah". Fig 1 (a map) which was prepared by Wicken (1978:28) indicates that this "sentinel of the savannah" (as Fitzgerald [1967:53] describes it) is widespread throughout the tropical regions of Africa except in the wet equatorial region at the heart of the continent, the wet coastal areas of monsoon West Africa, and the interior savannah above 3,000 metres. Wicken's map also shows that there are baobab trees growing in the wet areas of western and central Africa but their existence in these places is usually attributed to human intervention (Wicken 1982:179). Today the baobab can be found growing through the tropical regions of the world. It remains, however a "rare" tree wherever it has been introduced, being largely restricted to the more active areas of human settlement. It now grows worldwide along roadsides and in public and private grounds and it is also to be found in nurseries, parks, home gardens and botanic gardens.



FIGURE 1: *Adansonia digitata* — Distribution map (Wicken 1978:28)

I am willing to consider the possibility that the baobab is "native" to India especially in light of discussions like those of Huntley (1982:117) and Armstrong (1977). Huntley points to "relationships between African savannahs and those of other Gondwana continents" — relationships which I agree "deserve careful study". He goes on to say that while taxonomic affinities between Africa and South America are not particularly strong, many African genera are shared with their Indian arid and moist savannah equivalents in Rajasthan and

Madhya Pradesh". Armstrong (1977) focuses specifically on the baobab which he describes as a "remnant of Gondwanaland". The baobab is widespread in India and the idea that it is native to the region is far from popular. The conventional view is that the tree was brought to India, Sri Lanka and Java (Backer and Van Den Brink, 1963) sometime in the twelfth or thirteenth century in association with Arab trade and military activities (Stewart and Brandis 1874:30; Burton-Page 1969; Maheshwari 1971:58; Wicken 1982:182-183). Vaid (1978) presents another perspective on the origin of India's baobab trees that is intriguing and deserves to be mentioned here. He accepts the conventional view that the baobab is an exotic tree in India; he argues, however, (based on what he describes as an "interdisciplinary approach" involving botany, archaeology, mythology and phytogeography) that the tree has been in India over 4,000 years and that it was probably introduced by Indian seamen who made "circuitous voyages all around the Arabian Sea and adjacent parts of the Indian Ocean" (1978:37).

Baobabs grow in Sri Lanka (Macmillan 1954, Dassanayake 1980) and in Mauritius, (Armstrong 1977:212) and occasional specimens have been reported for the Philippines (Maheshwari 1971:59; Armstrong 1977:212) Malaya (Corner 1952) and Hawaii (Neal 1965: 568-570).

The tree has also been introduced into the tropics and subtropics of the New World. Owen (1970:25) reports its existence in South America, and although it is said to be "rare" in Florida (Stone 1982:2), I have, without great effort, identified over twenty trees and I suspect there are many more. In the literature the tree is also described as "rare" in the Caribbean, but it is far more common than is generally recognized. I have seen trees in Jamaica, the U.S. Virgin Islands (St. Thomas and especially St. Croix), Antigua, Barbados, St. Kitts, Puerto Rico and Trinidad and there are reports of trees in Tobago, Cuba, Haiti, Nevis, Dominica, Bahamas, and the Dutch Leeward Islands.

Description

The baobab is easily recognized because it is an immense tree with a huge bulging trunk or trunks topped by relatively short, thick branches that are often leafless for a good part of the year. I am in full agreement with Hollis (1963:138) who confessed to being "one of those who felt that this admirable tree justifies its existence by its mere appearance." African legend tells us that the bizarre appearance of the baobab results from the fact that it was planted "upside down" when the world was created (Wicken 1982:192). This points to the fact that its stumpy, irregularly shaped branches resemble roots thrusting into the air. The distinctly odd appearance of this curious tree makes it an easily recognized feature of the landscape wherever it

grows and has earned it various descriptive terms that include "ludicrous," "grotesque" and "ugly" (Blanks 1952; Emboden 1974).

The baobab usually sheds its leaves during the winter dry season and new leaves appear in the spring and early summer and last through the fall. The tree has alternate compound leaves each composed of a long leaf stalk with three to seven oval shaped leaflets radiating from the top like fingers from the hand. The leaflets which are usually five in number vary in size with the earliest being the smallest and the terminal leaflet being the largest.

The growth of new leaves in the spring and early summer is followed by flower buds on very long stalks that bloom in June and July (in the northern hemisphere). In some cases the large white or creamy "upside-down" flowers appear as early as May and trees in the Caribbean can be seen blooming as late as September.

From these flowers develop large, woody, gourd-like capsules that are oblong in shape and covered by what seems like velvet. Each fruit contains some thirty or more brown, kidney-shaped seeds embedded in a white or creamy acidic pulp laced together in a mass of tough, stringy fibers. These fruits mature through the summer and autumn and they ripen and fall from the tree in the winter, spring, and early summer.

Kung

The San are the hunting and gathering people of Southern Africa and they serve as a good example of the usefulness of the baobab fruit during the annually recurring period of seasonal scarcity. It is generally believed that they at one time occupied much of southern and eastern Africa and that they were increasingly pushed into the Kalahari desert with the spread of African pastoralists and the arrival of European colonists. The San number some 45 to 55 000 individuals in Botswana, Namibia, Angola, Zambia and South Africa and they are widely known to the rest of the world (Tobias 1956; Lee 1965; Campbell 1983). This results, in part, from the fact that their traditional hunting and gathering way of life has been intensively studied by anthropologists and the results have been made available in published works and in anthropological films. Current events in Southern Africa have helped to focus attention on the San who have also been featured in a recent commercial film ("The Gods must be crazy").

Not all San people have access to the baobab because the tree reaches its natural limits in southern hemisphere in the northern Kalahari, especially in the area that includes southern Angola, northeastern Namibia and northwest Botswana (Fig 1). In presenting an account of his botanical survey that covered northeastern Namibia and central Botswana, Story (1958:35) reports

that "the southern most specimens were seen in the neighborhood of Ghanzi, and from there it occurred sporadically to Gautscha Pan, the farthest point north reached by the expedition. There were big gaps in its distribution and it was rare throughout, but in some parts of the Transvaal it occurs abundantly and may have an unbroken distribution over many square miles of country". The area of the Kalahari where baobabs seem to be most common (although still not plentiful) is the area that is home to the !Kung San studied by Marshall, Lee, Yellen, Howell, Shostak, Katz and others. Other cultural groups living within the range of the tree's distribution in the central and western parts of Southern Africa also make use of the tree (Larson 1981, Campbell and Hitchcock 1985) and this is especially true of groups in the Transvaal region of northeastern South Africa (De Villiers 1951; Palmer and Pitman 1961; De Winter *et al* 1966).

Uses

Before turning to the seasonal food value of the edible seeds and pulp which is the focus of this paper, it is worth noting here that the baobab is useful to the San in many other ways as well. The tree is an element in their folklore. They value it for the water that is often stored in the hollow of its enormous trunk which also provides a habitation for many animals including bees which are much sought after for their honey. The tree is a wonderful source of shade in the dry, hot places where it is frequently to be found and being the largest living thing wherever it grows, it is easy to understand that it would be used as landmark and a lookout.

Folklore

The attempts to explain why the baobab has the appearance of having been planted upside down seem to vary from culture to culture. Owen (citing the 1967 Encyclopedia Britannica) says an Arab legend attributes the strange appearance of the tree to the work of the devil who uprooted it and replanted it upside down. Wright and Kerfoot (1966) report that a San legend attributes the tree's uncommon appearance to an angry and vengeful hyena who was dissatisfied with the tree he received when the great spirit was giving out trees to the first people and to animals. The hyena came late, only to receive the last tree left which was the baobab — the tree that nobody else wanted — and in anger, he planted it upside down (Owen 1970:27).

Water

Old baobab trees are frequently hollow and rain water is often trapped and stored in their huge trunks. In the Sudan, baobab trees are deliberately *protected* and *cultivated* for their ability to serve as

water cisterns and there are places which would be uninhabitable were it not for these trees (Blunt 1923; Newbold 1924; Owen 1968). Blunt suggested that "there were 30 000 water-holding baobab trees in the western Kordofan Province of the Sudan with a storage capacity of seven to half a million gallons". The !Kung make use of the water that is naturally stored in hollow baobab trees as well as in other hollow trees like *Boscia albitrunca* and the mongongo, *Ricinodendron rantanenu*. The water is obtained by using the hollow stems of *Kalanchoe rotundifolia*, *Leonotis microphylla* and *Panicum kalahariense* as "sipping sticks" (Story 1958:35; 1964:87; Vander Post and Taylor 1984:43-44).

Another way in which baobabs trees are of value to the !Kung in their effort to obtain water is the use of the hard woody shell of the fruit as a container. Lee (1979:123) reports that in addition to ostrich eggshells and empty whiskey bottles obtained in trade, the !Kung also made use of the "large pods of the baobab tree" to make water containers — containers that are used to collect, transport, store and use water. This use of the woody shell as a container has been reported for other parts of Africa where it is made into kitchen and eating utensils such as bottles, bowls, saucers, cups, spoons and ladles. The shell is also used to make musical instruments, masks and floats for fishing nets — a practice which occurs in both Africa and India (Watt 1889:107; Randhawa 1965:134; Jain 1981:45).

Honey

Hollow baobabs are frequently home to colonies of bees, a natural apiary, which makes the tree an ideal place to seek honey. Two of the oldest trees in the Caribbean, one in Kingston, Jamaica, and the other in Grove Place, St. Croix, had hives in their hollow trunks. So frequently is the baobab associated with bees that in parts of Africa, artificial hives are often hung in the tree. The San are extremely fond of honey and this is another important aspect of their relationship to the baobab. Given their tremendous size, climbing baobab trees is often difficult and dangerous. Stow (1905:56) tells us that the San "nevertheless scale its castle-like walls by means of two rows of pegs driven deep into the bark to serve as a ladder". In a footnote Stow (1905:56) says he "has seen places where the ... San, by a similar method, have climbed the face of a dizzy precipice ["the pegs were still in the face of the precipice"] where even a baboon could not have obtained a footing, to secure the much coveted honey of a bees' nest". The quotation below is taken from Elizabeth Marshall Thomas' book (1959:258-9) *The Harmless People*. Although it is rather long, it is worth quoting here for what it tells us about the San's regard for the baobab as a honey tree and the difficulty and

danger they face in climbing it (a point to which we will return further on).

In all the time that we had stayed at Nama we had not been to Gautscha Pan, and now Toma said he wanted to go there to gather honey from the Gautscha baobab tree. Before we left, he sat in his werf telling me stories of people who thought that they could climb baobab trees but whose self-confidence had been excessive, because they had all fallen, each and every one.

Steinbok Gumtsa was one of these, said Toma, and he was an excellent climber. Baobabs that others could not climb he managed, and ate honey from the upper branches every time. One day, while watching bees fly about the top of the very high baobab at Gautscha Pan, Steinbok Gumtsa thought to bring himself luck and said: "I am going to climb, but I will slip and fall and be killed". The others told him not to try it, but he did. "He thought he was too good", said Toma, "and that is why he did fall. The others found him dead at the bottom".

One-eyed Nishi was another good climber. He also tried to reach the honey in the top of the Gautscha baobab, but he slipped and fell and the other Bushmen found him dead at the bottom too, "with his head driven down between his shoulders", said Toma laconically, hunching his own neck to show how it was.

A third man whom Toma did not name climbed for honey in the Gura baobab, a tree somewhat north of Gautscha Pan, and he also fell; but, happily, he survived his experience. His sister and her husband were below him, watching, and when they saw him fall they held out their arms to catch him. He fell through their arms, of course, but his fall was broken and though he was unconscious for a long time he finally did recover.

The moral of these stories, Toma said, was to show that young people should listen to older people and not act rashly. I believe that he thought I was going to try to climb the Gautscha baobab (which I had already done, though only to the lowest branch, fifteen feet from the ground). for he went on to say: "When Bushmen tell young people not to climb baobab trees they should listen. It is seldom that a person lives who falls from a baobab tree, they are so high. Even those good climbers I told you about, they all fell". I assured him that I did not even want to climb it and he said: "Good. When we who are experienced get the honey you can watch from below. Then you can see just as well".

Shade

The baobab's leafed and leafless branches, its one or more main trunk or the chamber produced when the tree becomes hollow, all provide shade in the hot, dry, parts of the tropics where the tree is often to be found growing. The !Kung like other people meet in the cool shade of this immense tree when they seek protection from the glare and heat of the sun and shelter from wind and rain. We see an example of the baobab's value as a shade tree in the account of a !Kung woman named Nisa whose story was presented by Shostak (1981:96) in her book *Nisa: The Life and Words of a !Kung Woman*.

I remember a ... time when we were traveling from one place to another, and the sun was burning. It was the hot, dry season and there was no water anywhere. The sun was burning! After a while, we sat down... in the shade of a baobab tree. There was no water anywhere. We just sat in the shade like that. Finally, my father said, "Dau, the rest of the family will stay here under this baobab. But you, take the water containers and get us some water. There's a well not too far away". Dau' collected the empty ostrich eggshell containers, took the large clay pot, and left. I lay there, dead from thirst. I thought, "if I stay here, I'll surely die of thirst. Why don't I follow my big brother and go drink water with him?" I jumped up and started to run after him ... When I was beside him, he picked me up and carried me high up on his shoulder, and along we went.

... We walked and walked and walked until finally we reached the well. I ran to the water and drank and soon my heart was happy again. We started to walk back, Dau carrying the water and carrying me. After a while, he set me down and I ran along beside him... I ran along with him until I tired again and he carried me again. That's how we were when we arrived at the baobab, where our parents were waiting for us. They drank the water, and drank, more and more. "How well our children have done, bringing us this water! We are alive once again!" We rested in the shade of the baobab.

Landmark

"The Kalahari", writes Elizabeth Marshall Thomas (1959:3-4), "would be barren, very devoid of landmarks, if it were not for the baobab trees, and even these grow far from each other, some areas having none. But where there is one it is the biggest thing in all the landscape, dominating all the veld more impressive than any mountain... In the the Kalahari there is no need of hills. The great baobabs standing

in the plains, the wind, and the seasons are enough". It is easy to understand, based on what Marshall Thomas says above, that the baobab makes an ideal landmark (Lee 1979:52; Shostak 1981:377) and a good lookout (Thomas, 1970:192).

Fiber

One of the important traditional uses of the baobab in Africa is the fiber obtained from the inner bark and in some places it could well be described as a fiber tree. The fiber is used to make a great variety of things: cloth, string (for musical instruments, etc.), rope (especially tethering rope), snares, baskets, sacks, knapsacks, door curtains, wrapping material and fishing nets. Recent studies would suggest that the !Kung do not use baobab fiber but this does not seem to be true of the past. Stow writes in 1905 that "The...[San] convert the fibrous bark into a kind of matting which is sometimes used in lieu of a blanket or kaross. They look as if made of a material like coir. Bags, ropes, etc., are also made of it...(1905:56)."

Having briefly considered some of the important ways in which the !Kung make use of the baobab tree we can now turn to the main point of this paper: the seasonal food value of the fruit to the !Kung as an illustration of what I am suggesting is its seasonal value to the people of Africa in general.

Hard Times

The late winter, spring and early summer is the period of the annual cycle that is most frequently associated with seasonal scarcity in many parts of the tropics, especially in Africa. In a 1961 article entitled "Seasonal Hunger: A Vague Concept and Unexplored Problem", Marvin Miracle argues that the often reported existence of seasonal hunger in Africa did not in fact occur. For Miracle, seasonal hunger was precisely defined in biological terms. It occurred only when peoples' diet included fewer calories than needed at a particular time of the annual cycle even though their overall yearly intake was adequate. I am in full agreement with John Ogbu who has challenged Miracle's perspective. Ogbu (1973:317) writes:

Most of our evidence comes from anthropologists or others with close acquaintance with particular rural populations. These were neither trained in nutrition nor capable of calculating the daily calorie intake of the people they worked among. What they did report is that people at these seasons bore out the fact that since they ate less food, shifted to food they disliked, they became querulous and showed other signs of stress, and appeared to lose weight.... There is an abundant literature attesting to the fact that rural people in many parts of Africa are not able to meet their own nutritional standards through-

out the year (see Allan, 1965; Fortes and Fortes, 1936; Haswell, 1953; Johnston, 1958; Lynn, 1937; May, 1965; Phillips, 1959; Platt, 1954; Richards, 1939; Scudder, 1962; Schlippe, 1965).

In addition to the studies mentioned above by Ogbu, we shall also include the works of Evans-Pritchard (1940), and the many studies of the San (Thomas 1970; Marshall 1976; Lee and Devore 1976; Lee 1979; Shostak 1981).

If, as I have argued, "hard times" covers the period from the late winter, through the spring and into the early summer, then we can say that the baobab fruits during "hard times," for this is the time of the year the tree is in season producing large numbers of pods valued for their shell, pulp and seeds. In Jamaica, the tamarind (*Tamarindus indica*) also fruits at this time of the year and there is a saying which notes that "Tamarind season is hard times". What tamarind season is to Jamaicans the baobab season is to Africans: baobab season is hard times in Africa. Wicken (1982: 194) reports, for example, that "there is a saying in Senegal that 'the blacks die when the baobab has lost its leaves; it is the turn of the whites to die when it has regained its leaves' implying that mortality is highest for the native Senegalese during the cold dry season and for the Europeans during the hot wet season".

Lee (1979: 479) identifies the baobab as an important "winter fruit" for the !Kung and Stow (1905:57) observed that "the difficulty of throwing...down [the fruits] with stick and stones ensures a pretty constant supply throughout the winter season". While the fruits of the baobab may in fact be harvested as early as the late fall and continue into the spring, we should note, that for the !Kung, as Lee points out, the height of the season runs from the end of the winter into the early spring.

The way traditional societies like the !Kung picture the year results from the manner in which they schedule their productive activities in relationship to annual seasonal cycle of climatic change with its impact on the earth and on the growth and reproduction of plants and animals. With the summer rains comes the period of plenty for the !Kung which lasts until the early winter. Afterward comes the "spring dry season" which Lee (1979: 104) tells us is "the least attractive time of the year". Lee (1979:104) notes that "although humidity remains low, the days are exceedingly hot, with highs from 33° to 43°C (92° to 110°F) in the shade. Work is difficult and the better foods may be available only at distances from camp. It is in this season that the !Kung make use of the widest variety of plant foods. Fibrous roots, ignored at other times of the year, may be dug and eaten without enthusiasm ... By and large, spring is a time of waiting and eagerly scanning the horizon for the first sign of rain". In

Fig 2 below we see that the situation is the same for the G/wi San in the central Kalahari — they too face a period of difficulty in the late winter and early spring.

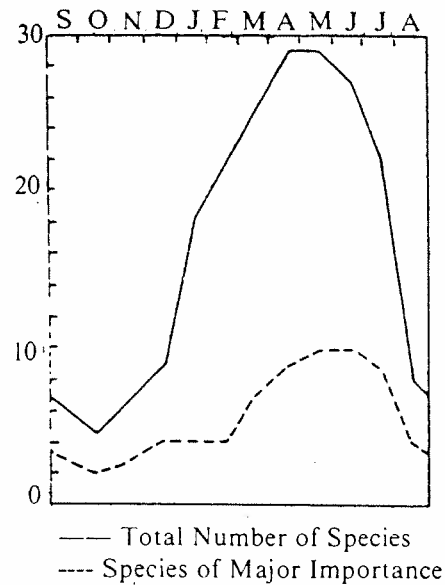


FIGURE 2: Monthly variation in number of species of food plants available (Silberbauer 1972:-283).

In general, "it is certain," writes Campbell (1983:127), "that some San groups in the more southerly region of the Kalahari District have a harder time than the people studied by Lee." While the G/wi San also suffer the effects of "hard times" in the winter and early spring, they are without the benefits of having baobab trees which do not grow in the central Kalahari. For the !Kung, however, it is at this most difficult time of the year — the annual dry season associated with a period of scarcity — that they seek out the baobab tree. While the baobab is frequently encountered in the northern Kalahari as I indicated earlier, Lee (1979:478-9) points out that it is only concentrated in a few of the western waterholes such as Dobe, !Kubi, !Xabi, and Mahopa (see Fig. 3 below) where it is second only to the Mongongo as an important food plant. We would expect that during the driest and most difficult time of the year the !Kung would be especially attracted to permanent waterholes where there were fruiting baobab trees. Lee (1979:261) tell us that "!Kubi gets many visitors from August to October during the height of the baobab season". I mentioned earlier that pegs are used to climb baobab trees with bee hives — a practice that also occurs in other parts of Africa (Guy 1972:161) and it seems this method is used to harvest the fruits as well. Unlike hives which are often in the main trunk or trunks of the trees, the fruits are borne on the branches which means climbing is not a very successful way to reach most of the crop. Marshall (1976:118) tells us that "The fruit is gathered when it falls to the ground,

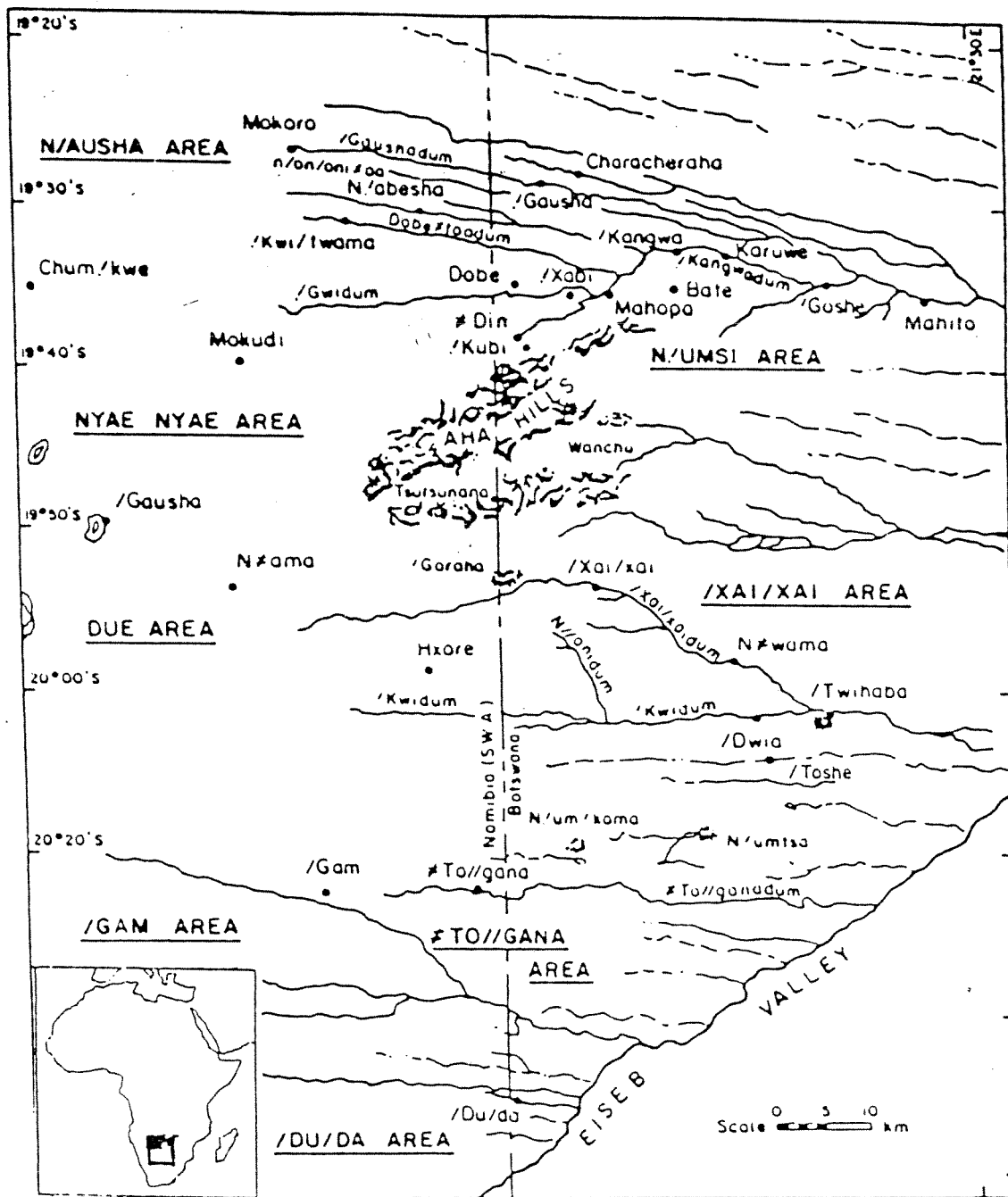


FIGURE 3: A slightly modified version of a map prepared by Lee (1979:41) showing the Dobe area and the location of water holes mentioned in this paper.

but people also keep suitable sized sticks at the foot of the trees to throw at the fruits". Knocking down the fruits by throwing sticks and stones does not seem to be a very successful strategy either as we have already noted. This means that most of the fruits are probably collected as they fall from the tree as Stow (1905:57), Marshall (1976:118) and Lee (1979:479) indicate.

While to the !Kung the baobab is not of primary significance, which is a distinction given only to the mongongo tree, Lee (1979: 168) identifies it as one of thirteen plants that are of "major" importance—"the food that keeps us alive", says Nisa, "are

mongongo nuts, baobab fruits, and sha and other roots I gather". Lee (1979:479) says with "young pods both [the seed and pulp] can be eaten together right from the pod". Since there is no further discussion on this point, it is difficult to tell if this is a common practice among the !Kung, especially when we consider that the fruits green or mature are difficult to reap by hand. The woody shell of the mature fruit is easy to break and the seeds embedded in the hard dry pulp which is bound together by a mass of tough fibers are difficult to remove. While the pulp of immature and mature fruits are eaten naturally, the pulp of the mature fruit is also

TABLE D.1.
Seasonal availability and nutritional composition of major San foods.

	Mongongo nut	Mongongo fruit	Baobab fruit, nut	Vegetable ivory fruit	Marula nut	Wild orange fruit
Season of use	Year-round	Apr.-Nov.	May-Oct.	June-Oct.	Mar.-Oct.	Sept.-Dec.
Composition (g/100 g as eaten)						
Moisture	4.2	13.4	5.2	6.6	4.0	69.3
Ash	4.0	5.7	7.3	9.0	4.2	1.0
Protein	28.3	6.6	14.3	4.9	30.9	4.1
Fat	58.4	0.6	13.9	0.4	57.0	0.1
Fiber	1.5	3.5	10.7	9.6	2.4	1.4
Carbohydrate	3.7	70.2	51.4	69.6	—	24.0
Kilocalories supplied (per 100 g)	654	312	388	302	642	114
Composition (mg/100 g eaten)						
Calcium	249	89.6	272	103	106	22.3
Magnesium	500	195	630	196.5	467	23.2
Iron	2.07	0.74	9.51	2.04	0.42	0.33
Copper	1.90	0.45	2.47	0.47	1.99	0.10
Sodium	2.0	1.01	76.3	544.9	338	2.6
Potassium	686.6	1760	4173	2560	677	354
Phosphorus	704	46.0	1166	155.8	836	52.2
Zinc	4.09	1.39	6.96	0.56	—	0.11
B-Carotene	—	0	—	0.06	—	0
Thiamine	0.13	—	—	—	0.04	—
Riboflavin	0.14	0.11	—	0.10	0.12	0.11
Nicotinic acid	—	0.12	—	4.62	0.71	0.85
Vitamin C	0.57	8.51	—	19.7	—	18.1
Sample No.	1025/67	1029/67	682/67	1033/67	(Wehmeyer 1966:1103)	1037/67

*Analyzed by A.S. Wehmeyer, National Nutrition Research Institute, CSIR South Africa; unless noted otherwise sample numbers refer to samples submitted by M.G. Whiting and R.B. Lee, October-December 1967 and June 1968.

Dash (-) = no information. (Table and notes prepared by Lee [1979:480])

gently pounded to separate it from the seeds and to reduce it to a fine powder — like flour to which water is added to make a porridge or a refreshing drink. In 1905 Stow mentioned the San use of the pulp to make a porridge which he describes as “very acid”. It is worth noting here that the seasonal value of the pulp from a nutritional point of view has long been recognized (Carr 1955). Nicol (1957:287) described it as “an important source of ascorbic acid in the local diets” of the Hausa-speaking farmers and Fulani cattle owners of Nigeria’s northern savannah”. Owen (1970:31) says that the dry season from January to March “is the period when citrus fruits are scarce in the forest belt and almost unobtainable in the Northern parts of the country. Hence the baobab serves the dual purpose of providing a rich source of ascorbic acid at the time of the year when it is most needed”. Lee (1979:480) notes the remarkably high levels of vitamin C contained in the pulp (213 mg over 100, according to Wehmeyer [1966:1103] who is cited by Lee). He tells us that “during the winter season the !Kung, simply by eating two or three baobab pods a day, can provide themselves with an almost therapeutic dose of vitamin C”. In addition to vitamin C,

Lee (1979:479) also reports that the pulp is “a good source of protein, calcium, phosphorus, potassium and thiamine”. Table I above which is concerned with the seasonal availability and nutritional composition of some of the San’s most important food plants was prepared by Lee (1979:480). Unfortunately, it only gives us information for the pulp and seed taken together.

Seeds

We know very little about the value of baobab seeds to the people of Africa in general and the !Kung in particular, but what little we do know suggests that they are widely used in a great variety of ways. We will look at some of these uses before turning specifically to the !Kung.

Dalziel (1937:114) reports that baobab seeds are used to string necklaces — a point also mentioned in the African Encyclopedia (1974:78) — although, I might add, they are not nearly as attractive as the seeds from other tropical plants like *Abrus precatorius*, *Caesalpinia bonduc*, *Coix laeryma-jobi*, *Ade-nanthera pavonina*, and *Delonix regia*. Potters use them “to smooth earthenware before firing” (Dalziel

1937:114) — a practice that has also been reported for India (Jain 1981:46). Baobab seeds are rich in potash and phosphates and their ashes, (as well as the ashes from the rest of the fruit and from the leaves and bark) have been used for manure and in soap making (Dalziel 1937:14; Irvine 1961:186). The seeds also have medicinal value. Emboden (1974:21) says that “in much of Africa” they are used to “guard against” malaria and Dalziel (1937:113) says they “are... used as a febrifuge or roasted and taken in the form of a decoction for dysentery”. Dalziel also points out that “in Senegal the seeds, roasted and pulverised, as well as the latex, are applied for toothache and inflammation of the gums”. In northeastern South Africa, Watt (1962:146) reports that “Near Messina the African uses the powdered seed as a remedy for hiccough in infants and children”.

Although baobab seeds are used in making ornaments, pottery, manure, soap, and medicines, they are most important as a source of food. The soft oily kernels which are difficult to remove from their thick, tough husks are eaten in their natural state either fresh or dried. The palatability of the seeds (which Irvine [1961:186] says “taste like almonds”) is indicated by the fact that students at the boys’ school of the Convent of Mercy Academy, “Alpha”, (in Kingston, Jamaica) eat the fresh kernel, so much so that to save the zinc roof of the building the boys would climb on to get at the fruits, almost a third of the tree’s crown was chopped off. In addition to being eaten in their natural state either fresh or dried, the seeds are also processed by soaking, roasting or boiling and by pounding, crushing or grinding to produce a fine or coarse meal. In preparing food, this meal serves as an ingredient added to other foods such as millet or groundnut; it is used for flavouring and to make drinks and it is also used by itself.

Irvine (1961:186) says the “Nankanis boil the seeds, together with those of bambara (*Voandzeia*) *geocarpa* (*Kerstingiella*) groundnuts, for food”. He also notes that in “N W Ashanti” the seeds are “washed, pounded, and steeped in water for 10 days” and then used to “flavour soup”. “In Northern Nigeria”, writes Owen (1970:31, “the fermented seeds are pounded and made into *Kuka dadawa*, a kind of cake [also] used for flavoring soup”. Dalziel (1937:114) reports that “a fine meal — Hausa *gavin Kuka* — of the seed kernels mixed with meal of millet, etc., is made into thin gruel or drink”. Owen cites Williamson (1955:12) who reports the use of the seeds to make a beverage in Malawi: “when scraped and pounded, mixed with the fruit pulp and boiled with water, they make a good sweet ‘milk’” (Owen 1970:31).

Baobab seeds yield from twelve (Owen 1970:30) to fifteen per cent (Irvine 1961:186) oil. This amount is insufficient to make it economically

valuable and it is said that Africans “rarely” make use of it. Nevertheless, Irvine (1961:186) points out that in French speaking West Africa it is used to dilute groundnut oil and as Owen indicates, the oil is extracted by “boiling for use in a native dish indulged in at certain festivals in some parts of Senegal” (1970:31).

The seeds are also ground and roasted as “a kind of coffee” (Brennan 1949:74; Palgrave 1957:54; Owen 1970:31) or as “a possible substitute for coffee” (Wright & Kerfoot 1966:51).

At this point we can now turn our attention to the use of the seeds by the San. Unfortunately, there is little information to go on which accounts for the suggestive nature of this paper. It will require further research (which I hope this paper will encourage) before we can come to reliable conclusions.

One of the earliest references I have found to the San use of baobab seeds is that of Stow (1905:35) who said that they “are eaten like nuts”. Lee (1979:479) notes, as I indicated earlier, that the pulp is gently pounded to separate it from the seeds but he does not tell us very much about the uses of the seeds. His comments indicate that they are used, however, for (as we saw earlier) he identifies the value of the tree to the !Kung in terms of the pulp and the seeds and he writes “the seeds, when roasted have a rich nutty flavor”. Elsewhere Lee (1979:188) indicates that they have “an energy value of 506 Cal. per 100g and a protein content of 34 g per 100 ...” and in an earlier article co-authored with Yellen (1976:38), he reports that they compare “favorably in calories and proteins to domesticated nuts”.

Conclusion

In this paper I have argued against the notion that baobab seeds are eaten as “famine” food per se with the implication that the seeds are always available to be eaten whenever such “hard times” or “food shortages” should happen to occur. I have suggested instead that a time of scarcity should be regarded as an annually recurrent period of the year and that the seeds like pulp are eaten at this time because this is the time the fruits are seasonably available. It would seem that the !Kung eat baobab seeds (as they do the pulp of the fruit) because they like to eat it, not simply because they are desperate for food. If in fact the !Kung only ate the seeds as “famine food” we would not expect them to eat them during the late fall and early winter when other foods are more plentiful; yet, Lee (1979:104) tells us that “the diet is varied during the winter months. Mongongo fruit and nut, baobab, and many species of roots and bulbs provide the staples”. The fact that the !Kung eat the seeds and pulp of the immature fruits is also relevant here for we assume that they would only be available in the

late fall and early winter when other preferred foods would be more readily available than in the late winter and early spring. Nevertheless, the available information does not allow us to be certain and we have to proceed with caution. It is possible that what is true of some Nigerians is true of the San as well, that some groups regard the seeds (and the fruit as a whole) as a preferred food while others eat it only in "hard times". Evidence that this might well be true is provided by Lorna Marshall (1976:118) who tells us that "The Gautscha people did not like baobab fruit very much and, if enough of something else were on hand, would leave it ungathered. However, the fruit keeps well, and by the end of the dry season it would all be eaten". Marshall's comments suggest that for "The Gautscha people" at least, the fruit were eaten because of "hard times".

I suspect that further research will support the perspective taken in this paper, but until such time there is still so much that we do not know about this remarkable tree which is unfortunate given its practical and religious importance to the people of Africa. It is unfortunate, indeed, since the baobab, more than any other tree, is symbolic of the continent and its people (Thebaud 1984; Steffens 1984). Even with the many studies of the San of the northwest Kalahari, we still know very little, not only about the use of the seed but about the overall significance of this remarkable tree in their cultural life. Nevertheless, I think careful studies will show that what I am suggesting for the !Kung San might well hold true for other peoples of Africa as well: the baobab fruit is a preferred food that is eaten during "hard times" because it is good to eat and that is when it is available.

NOTES

1. Uphof's (1958:8) precise perspective is that "Pounded seeds are used in *some* [my emphasis] regions as famine food" while Vaid (1978:40) states that the "seeds which are pounded and eaten as food in times of scarcity or regularly [my emphasis] mixed with meal of millet". It is important to recognize that although both authors identify the use of baobab seeds during hard times, they are careful to point out that there are *some* regions where the seeds are *regularly* eaten as a preferred food, not as "famine food". Stutervant (1972:24) (who cites Monteiro [1875] refers specifically to the use of baobab seeds "for food in times of scarcity" and Weiss (1979:40) says they are eaten in Angola and East Africa "when food is short". It is not clear from these reports whether the seeds are pleasant or unpleasant to eat or whether the seeds are only eaten in times of scarcity because *that is when they are available* or because *there is nothing else available*. Even if these accounts are accurate and

the seeds are eaten as "famine food", it is possible that the people of East Hausa and elsewhere are only examples of the many exceptions to the rule. It seems reasonable to assume that in many cases, people eat baobab seeds as a preferred food.

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