



HAL
open science

Food supply uncertainty among the Aka Pygmies (Lobaye, C.A.R.)

Serge Bahuchet

► **To cite this version:**

Serge Bahuchet. Food supply uncertainty among the Aka Pygmies (Lobaye, C.A.R.). de Garine and Harrison (eds). Coping with Uncertainty in food supply, Oxford University Press (Oxford), pp.118-149, 1988. hal-00400065

HAL Id: hal-00400065

<https://hal.science/hal-00400065>

Submitted on 17 Dec 2010

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Food supply uncertainty among the Aka Pygmies (Lobaye, Central African Republic)

S. Bahuchet

INTRODUCTION

Food supply uncertainty in humid tropical environments raises innumerable questions and makes it necessary to tackle a wide range of difficult problems. The rain forest has the tenacious reputation among anthropologists of being either rich or hostile but always homogeneous. At first glance, therefore, it would seem that the issue of uncertainty would not apply here. However, in the light of recent investigations by biologists and ecologists, such a belief must be rejected. Moreover, ethnological works about African hunter-gatherers in the forest (Turnbull 1965; Demesse 1980) pay little attention to the analysis of environmental variations, and until recently we seldom encounter publications presenting food-getting activities in a seasonal framework.

In this paper I attempt to determine what is liable to vary in the food supply of Aka hunter-gatherers living in the Central African forest and also to define what the range of variation may be. The notion of *uncertainty* implies both *unpredictability* and *variability*. Seasonality is distinguished from unpredictability, since these terms do not seem to me necessarily related. Such a distinction indicates that the forest is *not* homogeneous but subject to variations, a situation which creates problems that forest dwellers must cope with. Are their solutions technical or social? Since these problems do exist, to what extent can we speak of constraints?

AKA PYGMIES IN LOBAYE

Between the Oubangui and Sanga Rivers, in the southern Central African Republic and northern Congo (Fig. 6.1), is a region occupied by several tens of thousands of Pygmies speaking Aka, a unique Bantu language (Cloarec-Heiss and Thomas 1978). This paper is based on research work carried out along the northern border of this area, near the Lobaye River, from 1972 on, during many field trips varying in length from 2 to 18 months (Bahuchet 1972, 1979, 1985)¹. The whole area is covered with rain forest, but the features differ from north to south according to latitude (from 3°N to the equator) and relief, about

¹ These field trips were made possible by different grants from Laboratoire d'Ethnobotanique et d'Ethnozoologie (Museum National d'Histoire Naturelle), Equipe 'Recherche ethnobotaniques' (Centre National de la Recherche ERA 773), and Laboratoire des Langues et Civilisations à Tradition Orale (CNRS LP 3121).

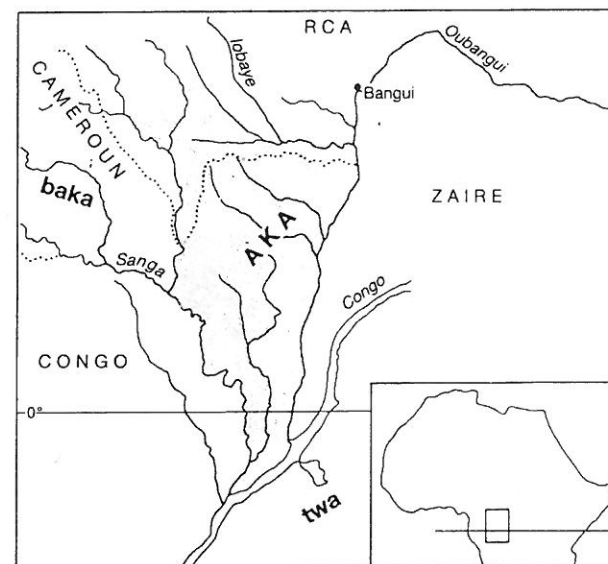


FIG. 6.1. Map of area.

half of this area being characterized by the hydromorphic soils of the Congo Basin. While Aka are present nearly everywhere in this forest area, which covers 100 000 km², they are never alone, for several other ethnic groups, speaking different languages, also live in the same region, mostly along the rivers (Oubangui, Sanga, Likouala, Motaba, Ibenga, and Lobaye). These people also use the forest, even far from their villages, for slash and burn cultivation and for hunting and gathering. Throughout this area, the Aka are in contact with agriculturalists (Bahuchet and Guillaume 1982), and their relationship, one of economic dependence, is characterized by the exchange of manufactured goods (e.g. tools, containers) and cultivated starches for game and manual labour.

The *camp* is the Aka socio-economic unit and contains about ten huts, that is, about ten monogamous conjugal families. The eldest member of this residential group maintains authority or, more exactly, is resorted to in times of crisis. The Aka form an acephalous society, based on respect for seniors and elders, a society in which each person takes part in the daily life of the community consciously and without being ordered by a superior.

FOOD RESOURCES

Seasonality

Foodstuffs can be distinguished according to their animal or vegetable origin and whether they are wild or cultivated. Cultivated foods will be treated later on, for they are always obtained from the villages (the Aka do not practice agriculture on their own).

My intention here is not to give an inventory of wild food resources (this has been previously done; cf. Bahuchet 1978 and 1985) but to analyse the variations which affect them. Two factors must be taken into account: space and time. Spatial distribution affects resource accessibility, while temporal cycles modify periodic availability. The spatial distribution of plant species is heterogeneous because of sylvigenesis (tree by tree regrowth) which results in a 'mosaic' structure. This structure is favoured by phenomena of internal regeneration, which are totally unpredictable and which sustain a pattern of *fundamental heterogeneity* in the rain forest (Hladik 1982). On a much larger scale, soil moisture contributes to this pattern as do, to some extent, geological strata (Bahuchet 1978). However, the seasonal factor has a more noticeable influence on availability. The tropical climate of Lobaye, the study area, is marked by two seasons: a dry one during three months (December to February) and a wet one, with a maximum of rainfall from July to October (an average of 200 mm a month). The total rainfall during the last twenty-five years is 1714 mm on an average of 117 days a year. The temperature is a fairly constant 25°C (Fig. 6.2).

Direct observations about the appearance of such and such a product in such and such a season are not sufficient to comprehend biological mechanisms. Productivity and induction seem to be connected, on the one hand, with internal rhythms and, on the other, with day-to-day variations, even minimal ones, of such factors as photoperiod (daylight) or diurnal and nocturnal temperatures (Catinot 1970; Longman and Jenik 1974; Hladik 1978). But the complexity of the rain forest is due not only to the vast number of species (more than 3000) but also to a wide range of biological cycles. Some species show regular cycles for leafing or flowering (once or twice a year), but others are completely irregular. There are species in which all the individuals bloom at the same time (but with a regular cycle), others which maintain continuous production, and still others in which individuals are totally asynchronised (e.g. some *Ficus*). There are three main types of phenological sequences as far as the leaf production of trees is concerned: (a) leaf fall during a fairly short period once a year (or without an annual cycle), the trees remaining bare for a few days (these are deciduous trees), (b) leaf fall in peaks with concomitant flushes of new leaves, (c) leaf fall more or less continuous throughout the year [(b) and (c) are evergreen species: Hladik 1978].

As far as gathered products are concerned, yams, fleshy fruits, nuts, and

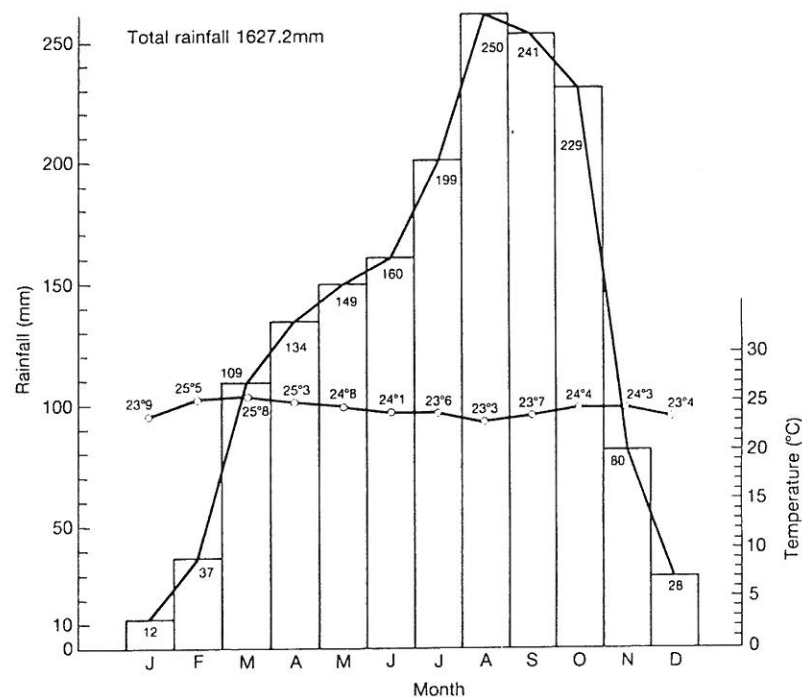


FIG. 6.2. Climatic conditions in the Lobaye region (based on measurements at Boukoko station, 1970–1977).

mushrooms are seasonal, as are invertebrates living on leaves (caterpillars), wood (termites), and flowers (honey-bees). Table 6.1 and Figs 6.3 and 6.4 show cycles for most of these species as observed in Lobaye. Here only the major products—yams, caterpillars, and honey—will be treated.

The complexity of the rain forest, already mentioned, can be illustrated by yams (*Dioscorea*). According to the Aka, the tubers would seem to be available only during the dry season and the very beginning of the rainy season (from the end of October to June). However, my observations indicate that tubers are dug up all year long but in a random manner. Two out of six species are annual and, when the first rains come, new stems grow rapidly, consuming the reserves contained in the tubers. At least two more species are perennial, with woody roots on which the starchy tubers grow. Another is biennial, with its stems drying up every two years. The tubers of wild yams in the forest are reserves which enhance the individual plant's chances of survival. They help it to resist folivores, especially during the very long period preceding reproduction by seed, a process favoured by the random appearance of 'chablis' (clearings made when a tree falls) (Hladik, Bahuchet, Ducatillon and Hladik 1984).

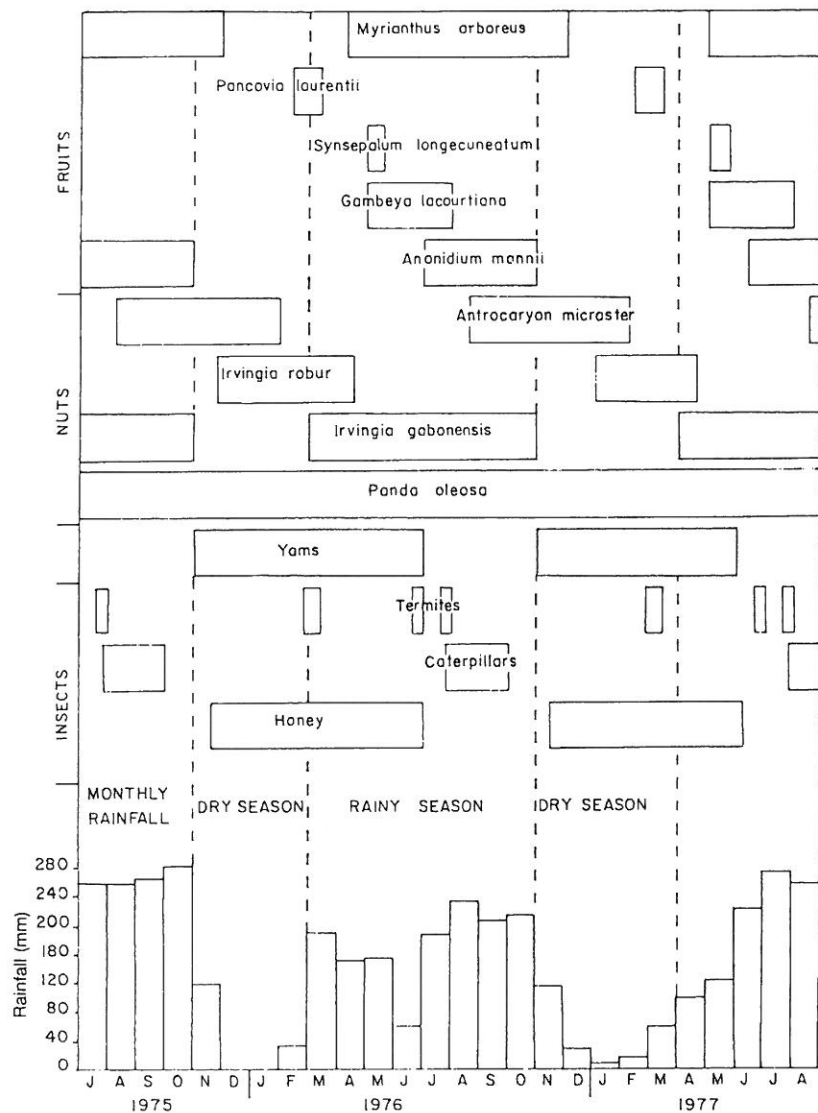


FIG. 6.3. Seasonal resources in the Lobaye region.

Edible caterpillars (*Attacidae* and *Thaumetopoeidae*) are nocturnal moth larvae which feed on the leaves of large canopy trees. They are gathered in great quantities at the pupal stage when they fall to the ground prior to metamorphosis. This phase is extremely brief but perfectly cyclical.

The honey-production cycle is quite poorly known. It seems that the height

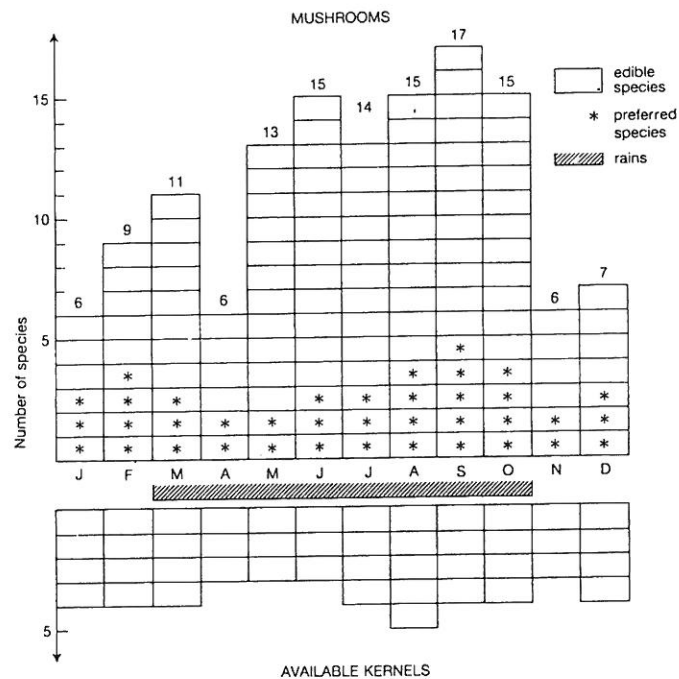


FIG. 6.4. Number of edible species available per month.

of the rainy season (July to October) corresponds to a wintering among the bees. When the rains end, the bees emerge suddenly and massively from their hives, invading the forest and the camps. These clouds of bees mark the onset of the dry season. They immediately begin gathering nectar and produce honey up to the first violent showers. During wintering, bees consume their stored honey, exhausting their stocks by the end of the rainy season.

Mammal populations, on the other hand, do not appear to be influenced by biological cycles, even if some species seem to have reproductive seasons (e.g. quenons), but once again, little is known about this as far as African rain forest is concerned (C.J. Owen 1976)

TABLE 6.1 Plant food resources

Latin names	Aka names	Edible part*	Availability by month													
			J	F	M	A	M	J	J	A	S	O	N	D		
Acanthaceae <i>Whitfieldia elongata</i>	mò.indò lù	L	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Anacardiaceae <i>Antrocaryon klaineianum</i>	bò.pépè	F	x	x												x
<i>A. micraster</i>	bò.záli	K	x	x								x	x	x	x	x

Latin names	Aka names	Edible part*	Availability by month											
			J	F	M	A	M	J	J	A	S	O	N	D
Anonaceae														
<i>Anonidium manii</i>	mò. bèi	F	x	x	x	x	x	x	x	x	x	x	x	x
Apocynaceae														
<i>Landolphia jumellei</i>	bò.sénzà	F	x	x	x	x								x
<i>Landolphia sp.</i>	ndèmbò	F	x	x	x	x								x
<i>Pycnobotria nitida</i>	mò.ngénzè	L	x	x	x	x	x	x	x	x	x	x	x	x
Cesalpiniaceae														
<i>Gilbertiodendron dewevrei</i>	bèmbà	K												
Clusiaceae														
<i>Mammea africana</i>	bòtò	F												
Commelinaceae														
<i>Palisota ambigua</i>	dòtò	L	x	x	x	x	x	x	x	x	x	x	x	x
Cucurbitaceae														
<i>Telfairia occidentalis</i>	mò.tùmbèlùmbè	K	x	x	x									x
Dioscoreaceae														
<i>Dioscorea burkilliana</i>	ngàngè													
<i>D. mangenotiana</i>	è.kùlé													
<i>D. minutiflora</i>	di.bòmù													
<i>D. praehensilis</i>	è.sàè													
<i>D. semperflorens</i>	è.sùmà													
<i>D. smilacifolia</i>	bò.bàkà													
Euphorbiaceae														
<i>Ricinodendron heudelotii</i>	è.kòpò	K				x	x	x						
<i>Tetracarpidium conophorum</i>	mò.kàsù	K				x	x	x						
Gnetaceae														
<i>Gnetum africanum</i>	è.sètè	L	x	x	x	x	x	x	x	x	x	x	x	x
<i>G. bucholizianum</i>	kòkò	L	x	x	x	x	x	x	x	x	x	x	x	x
Irvingiaceae														
<i>Irvingia excelsa</i>	páyó	K				x	x	x	x	x	x	x	x	x
<i>I. gabonensis</i>	páyó	K				x	x	x	x	x	x	x	x	x
<i>I. grandifolia</i>	mò.sòmbò	K				x								
<i>I. robur</i>	bò.kòmbèlè	K	x	x	x	x								x
<i>I. cf. wombulu</i>	mò.pèndèndè	K							x	x				
Menispermaceae														
<i>Dioscoreophyllum cumminsii</i>	mò.àlà	F.R	x	x										
Moraceae														
<i>Myrianthus arboreus</i>	ngàtá	F	x	x	x	x	x	x	x	x	x	x	x	x
<i>Treculia africana</i>	púsá	K							x	x	x			
<i>Trilepisium madagascariense</i>	mò.póngi	K				x								
Pandaceae														
<i>Microdesmis puberula</i>	mùsúkùmbálà	L	x	x	x	x	x	x	x	x	x	x	x	x
<i>Panda oleosa</i>	bò.káná	K	x	x	x	x	x	x	x	x	x	x	x	x
Phytolaccaceae														
<i>Hillieria latifolia</i>	sùmbá	L	x	x	x	x	x	x	x	x	x	x	x	x
Sapindaceae														
<i>Chytranthus sp.</i>	di.tókòdi	K							x	x	x			
<i>Pancovia sp.</i>	bò.téndè	F				x								

Latin names	Aka names	Edible part*	Availability by month													
			J	F	M	A	M	J	J	A	S	O	N	D		
Sapotaceae																
<i>Gambeya lacourtiana</i>	mò.bàmbú	F										x	x			
<i>G. perpulchra</i>	bò.nzúnzè	F										x	x			
<i>Manilkara maboensis</i>	bò.ngénzà	F											x			
<i>Synsepalum stipulatum</i>	mò.sétéké	F										x				
Sterculiaceae																
<i>Cola urceolata</i>	mò.ngài	F												x		
<i>C. verticillata</i>	di.kó	K														
<i>Eribroma oblongum</i>	è.gbóyò	K										x				
Styracaceae																
<i>Afrostryax lepidophyllus</i>	mò.ngémbá	L.K										x	x	x	x	
Tiliaceae																
<i>Desplatsia dewevrei</i>	nzámبالámbá	F												x	x	x
Violaceae																
<i>Rinorea sp.</i>	jàgòàlà	L	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* L = leaf, F = fruit, K = kernel

Seasonality or uncertainty?

The problem is to predict the periods during which intermittently available resources can be obtained. The yearly *sequence* or succession is perfectly well known to the Aka, who define their seasons according to the appearance of such and such a resource (Fig. 6.5). Nevertheless, climatic variations (e.g. a more or less humid year) may be responsible for the diminution of a product or even for its total absence. For instance, people remember a year like 1975 when there were no caterpillars at all.

Variations in temperature or in rainfall lead to physiological reactions in

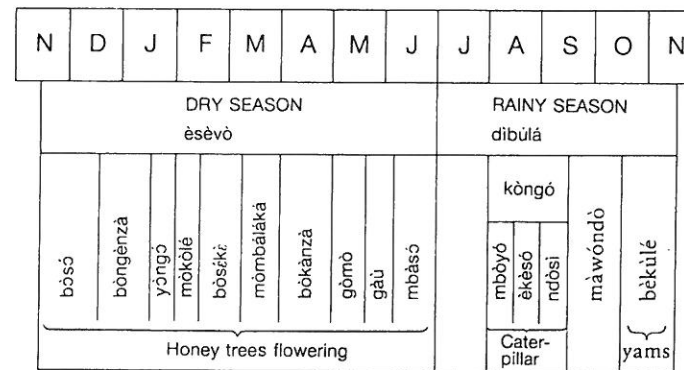


FIG. 6.5. An example of an Aka calendar.

plants (leafing or flowering) and this can modify the living conditions of their primary consumers (e.g. caterpillars on leaves, bees on flowers). Climatic variations may be considerable, as in 1983 when a great drought (no rain for five months) withered vegetation and favoured fires caused by lightning. Observations covering a period of thirty years reveal that rainfall ranges between a maximum of 2385 mm and a minimum of 1334 mm, with an average of 1714 mm (Fig. 6.6). However, the evaporation and transpiration of the rain forest is no more than 100 to 150 mm a month and any excess water cannot be absorbed (Hladik 1982). Therefore it would seem that years of heavy rain have less influence on plants than years of insufficient rain, which result in considerable leaf fall.

Miracle (1961, p. 275) distinguished three types of variations in food supplies: (a) little or no variation (regular); (b) variable according to a fairly predictable pattern (cyclical); (c) highly variable (irregular or sporadic). Each of these types can be combined with a temporal variation: yearly fluctuations, variations in the duration of shortages, or variations in the periods when shortages occur. The products gathered by the Aka show all three types, with some being unpredictably absent for years at a time. Later, however, we shall see that

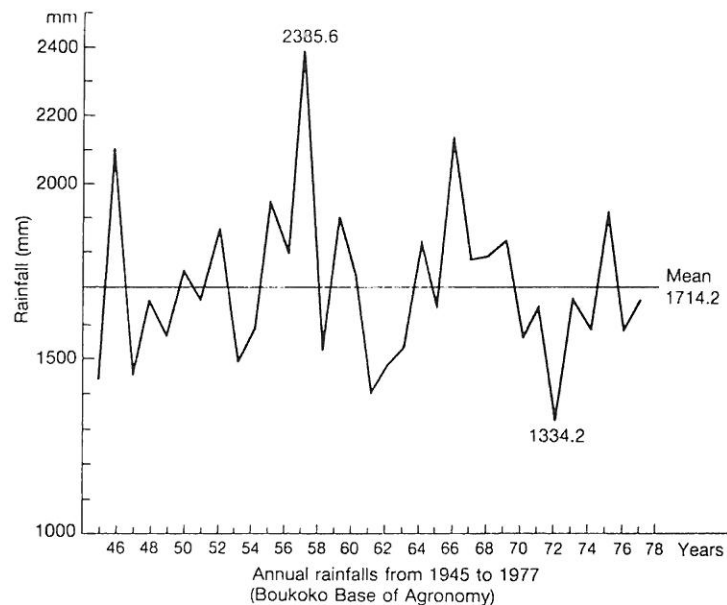


FIG. 6.6. Annual rainfalls from 1945 to 1977 in Lobaye.

edible species are numerous enough so that the lack of one does not imply physiological 'seasonal hunger' (cf. Pagezy 1982).

To sum up, the rain forest is an environment liable to variations in both plant production and productivity, not only throughout the yearly cycle but also from one year to the next. As a result, most of the edible plants used by the Aka vary both quantitatively and qualitatively, even if the order of their appearance during the year is well known and therefore predictable. The same applies to invertebrates. Mammal populations, on the contrary, do not show seasonal fluctuations. Before considering if any cultural significance is connected with variations, I will first describe food-getting activities according to their annual calendar.

FOOD-GETTING ACTIVITIES

Aka Pygmies use very diverse hunting techniques, each of them adapted to different types of game:

- (1) Individual hunting with bows and arrows or cross-bows for monkeys and large birds, exceptionally for duikers and large bats.
- (2) Collective hunting with spears for large mammals, e.g. elephants, chimpanzees, gorillas, red hogs, yellow-backed duikers, bongos, situtungas.
- (3) Collective net-hunting for duikers.
- (4) Hunting with large framework nets for porcupines and more rarely mongooses.
- (5) Trapping rodents using bait.
- (6) Snaring mainly porcupines and duikers (without bait).
- (7) Hand-catching pangolins, tortoises, tree hyraxes, and Nile monitors.
- (8) Catching giant ant-eaters, armadillos, etc. at their burrow exits.

Different methods require different numbers of participants. For spear-hunting, many men are needed, while net-hunting entails the collaboration of all the men and women available. Otherwise, two or three men or a couple may co-operate (e.g. in porcupine catching).

The number of people participating in gathering activities is influenced more by social factors than by technical necessities. This applies to gathering caterpillars, mushrooms, or nuts, which can be done by both men and women. Honey collecting, however, is an exception, the bee nest being taken by several men, without any women.

We have seen that the socio-economic unit is the camp or local group, that is, a community where individuals mutually support each other, materially and morally, and where both men and women collaborate in hunting and gathering to assure their daily food supply.

The Aka Year

Obviously, all the food-getting techniques are not practised simultaneously and certain seasonal variation is evident.

The arrival of large number of bees in the camp heralds the end of the rains (mid-November). Each man leaves the camp at day-break, armed with a cross-bow and poisoned arrows, to search for monkeys. Along the way, he tries to locate bee nests in the tree tops. Later in the day, some men may get together and chase brush-tailed porcupines, seeking to immobilize them under a fallen trunk and then catch them in framework nets when they try to escape from their hiding place. If it happens that a husband and wife are hunting together in this way, they may also collect *bòkòmbèlè* nuts (*Irvingia robur*) which begin falling at this time. While foraging, women may also dig up newly grown yams (Fig. 6.8). This is the moment when big mushrooms grow in very large numbers on termite mounds. When streams begin to dry up, girls dam up small meanders and catch handfuls of tiny fish by bailing out the water. These minor activities last till the very end of the wet season.

When it rains less than once a week, contacts between neighbouring camps increase and in January everyone moves to the same site and a very large camp is set up. This is the reunion period during which young people become acquainted, dances are held daily, and marriages prepared. Great collective net-hunts make feeding such a large group possible. For two months, men, women, and children go out every day to set up a wide circle of nets and drive duikers into them from the centre outwards. Once the wet season returns groups disperse again, since too-frequent showers shorten the hunting day and make it impossible to leave nets up over night. Each camp resumes its previous activities, such as hunting individually or in pairs with cross-bows and framework nets. This is the time of year when the rich *Irvingia excelsa* nuts (*pàyò*) are abundant, and conjugal families gather at the feet of the trees and break open large quantities of these nuts to extract the broad, flat kernels. They also take along little framework nets and try to catch porcupines.

At last, the sign everyone has been eagerly awaiting appears: the *mbàsò* trees (*Dialium* spp.) begin to flower (May). The Aka immediately carry out the *mòbándì* honey ritual, for it is only after this that men can collect the bee nests they have located in the trees and marked during the preceding months (see Fig. 6.7). All other hunting activities now become secondary and honey occupies the major place in their diet.

In July precipitation begins to increase, with rain first twice a week, then every other day. Hunters carefully prepare strong shafts for their large spear blades. Then, after performing a great propitiatory ritual, they leave the family camp and set up their own hunting bivouacs deeper in the forest. Everyday they go out to identify the tracks of large mammals in the damp soil (the *nzàngó* hunt). Their only reliable food sources are yams dug up by adolescents and honey collected from hives that have been reserved for this occasion. Red hogs,



FIG. 6.7. Honey collecting in a tree.

easy to locate, constitute their daily prey, but elephants are the most sought after and prized game.

When thin, striped caterpillars, *sùsù* (*Noctuidae*), start falling from the trees and cover the forest floor, thus heralding a period of plenty, it is time for the hunters to return to their camp where their wives are waiting for meat (the end of July). For two months, everybody gathers caterpillars, first the *mbòyó*, then the *bèkèsó*, and finally the *ndòsi*. Everyday after collecting caterpillars, everyone goes off to the mushroom fields, where *mèbòdi*, *mèmbólókómbólókó*, and *mèsélèlè* stretch as far as the eye can see. Large tortoises come to feed on these mushrooms and can be easily caught. Sometimes during this period of abundance, men set off to track down red hogs whose spoors have been found near *Irvingia* trees. Such small hunts called *gbégbélé* are quite different from the great *nzàngó* hunts, which last much longer and are resumed after the caterpillar season. When the men return to their bivouacs, daily life becomes



FIG. 6.8. The digging stick for the yams.

harder for the women. There are no more caterpillars falling from the trees, yam tubers are rotten by now, and preferred mushroom species have become scarce, while the *Iringia* kernels are beginning to decompose or germinate. Therefore they wait impatiently for the rains to be over and for their husbands to return to camp loaded with meat.

Such an annual cycle, as summarized in Table 6.2, corresponds to a recent but pre-colonial period (more or less a century ago). Nowadays, modifications

TABLE 6.2. Hunting methods according to the number of people present.

Hunters' number	Swamp forest		Terra firma forest	
	Dry season	Rainy season	Dry season	Rainy season
One man	Cross-bow (monkeys)	Cross-bow (monkeys)	Bait traps (rodents), cross-bow (monkeys)	Snares, bait-traps, cross-bow (monkeys)
Couple			Framework net (porcupines)	Framework net (porcupines)
6-10 men from a group	Spear (elephant, red hog)	Spear (elephant)	Spear (duikers)	Spear (red hogs, chimpanzees)
15-30 adults from a band	Nets (duikers, chevrotain)		Nets (small duikers)	

Season	Month	Dwelling	Gathering			Hunting		Task group								
Aka dry season	Last rains	Nov	Mixed camp, 25-30 people	Yams	Honey locating	Honey collecting	Bow (monkeys), net (porcupine)	Man alone or father and son and women and girls together								
		Dec														
	Dryness	Jan	Gathered camps, 70-100 people					Large framework hunting (duikers)	Oleaginous kernels, Iringia	Spear: red hog, bongo, elephant, gorilla, chimpanzee	Individual: bow (monkeys), framework net (porcupine)	Everybody: men, women, and children				
		Feb														
	First rains	Mar	Mixed camps, 25-30 people									Mushrooms	Caterpillars	Spear: red hog, bongo, elephant, gorilla, chimpanzee	Individual: bow (monkeys), framework net (porcupine)	Man alone or father and son and women and girls together or conjugal family
		Apr														
Less frequent showers	May	Male camp Female camp		Men together Women together	Everybody or conjugal family	Men together Women together										
	Jun															
Aka rainy season	Heavy rains	Jul	Mixed camp				Men together Women together	Everybody or conjugal family								
		Aug														
	Sep	Male camp Female camp	Men together Women together						Everybody or conjugal family							
	Oct															

FIG. 6.9.

have occurred, which can be attributed mainly to changes in the villagers' way of life. Briefly, now that villages have become permanently fixed settlements, activities are more sedentary, resulting in increased cultivation and decreased forest foraging. This means that non-Pygmy villagers rely more and more on their Pygmy allies for meat supplies and also for help in preparing new fields. Traditionally, the dry season was devoted to net-hunting but, as it is also the best time for agricultural work, the Aka have to stay near the villages during this period. Therefore they have come to alternate seasons of hunting with those of field labour, creating a biennial cycle.

Variations in activities become apparent when they are examined over an entire year. During a week each month in 1976, I noted working hours for each person in the same camp, plotting them on an actogram (Fig. 6.10), showing changes in proportions of time devoted to different food-getting activities, i.e. hunting, trapping, gathering, and activities connected with the villagers (either work in the fields or trips for trading or obtaining supplies). The average time spent is 56 per cent for hunting, 27 per cent for gathering, and 17 per cent for village work, but values fluctuate between 26 per cent and 90 per cent for hunting, 8 per cent and 56 per cent for gathering, and 0 per cent and 34 per cent for village work. Some techniques or activities are very seasonal (e.g. fishing or honey gathering), while others persist all year long, even if they decrease in importance. Some alternatives are evident: trapping and individual

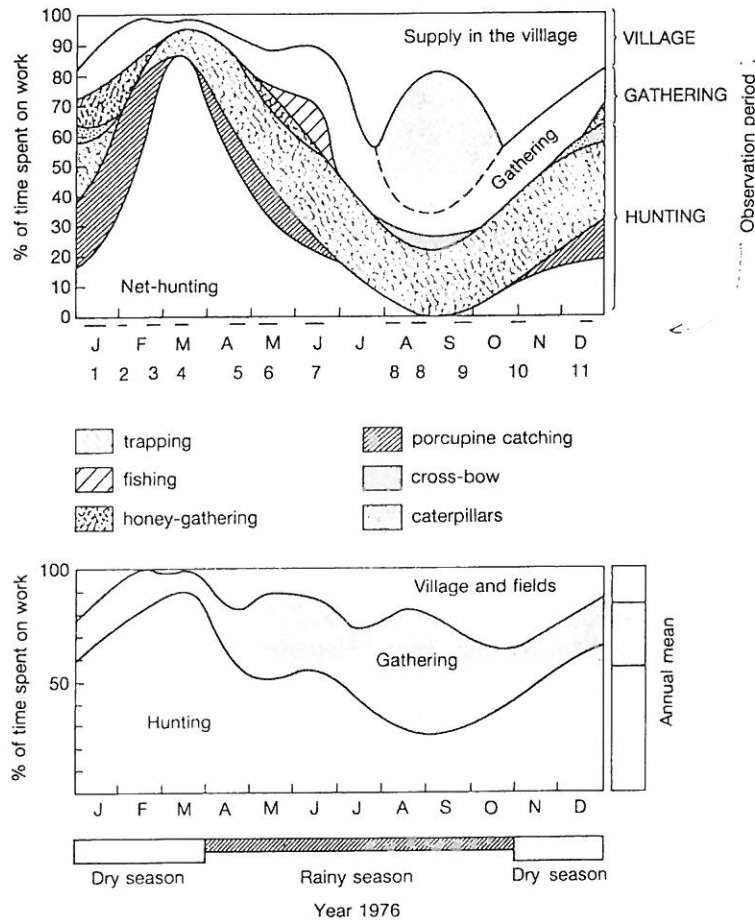


FIG. 6.10. Time devoted to different food-getting activities in the course of a year.

hunting (with cross-bows or guns¹) replace net-hunting during the wet season. It is also obvious that during the trapping period the time spent in village contacts is the greatest.

The influence of seasonality on the organization of activities

In this section, I propose to examine how biological variations in forest resources may influence the annual calendar as described above.

¹ Guns are always temporarily lent by villagers, who are thus hiring the services of the hunters, so to speak.

Gathering

Only gathered resources are significantly seasonal, but only the caterpillar period corresponds to a specific activity. In other cases, we have to speak of *possibilities*, since by exploiting a great number of plant species, the Aka are sure to find food sources available at any given time of the year.

Honey collecting is connected with the dry season, but although a hive life cycle does exist, the choice of the gathering period seems to be determined more by *technical facility* (ease in locating nests by observing workers' movements) than by biological impossibility. Even though bees consume their stored honey when wintering, it is really only during the last days of the rainy season that their reserves are completely exhausted. It is, therefore, just prior to wintering that the hives contain the most honey. This period corresponds in Lobaye to the Aka honey ritual (mid-June). The Aka can even locate nests during wintering by observing the amount of chitinous bee remains around carnivorous ants' hills.

In fact, despite seasonal rhythms or relatively cyclical activities, what especially characterizes food-getting strategies is the *mental versatility* of the Aka, that is, a shrewdness of perception that allows them to *take advantage immediately of any opportunity* they encounter.

Hunting

Seasons do not obviously influence mammal populations, making it more delicate to analyse the effects of seasonality on hunting than on gathering, but it is evident that hunting methods do vary according to the seasons. Aka techniques take into account all the prey's behaviour patterns, e.g. feeding habits, rhythm of daily activities, communication behaviour, aggression or flight. Knowledge of feeding habits enables hunters to locate animals at precise feeding places in their territories and at the times corresponding to food availability. Knowledge of nycthemeral rhythms makes it possible to approach active or resting game. To stalk large mammals it is necessary not only to read such signs as spoor and food remains but also to take precautions to prevent the quarry from hearing or smelling the hunters. In fact, while animal species themselves do not follow annual cycles, the signs used to locate them are affected by climatic constraints, e.g. when preferred foods are available, whether the soil is damp enough to retain tracks, whether the undergrowth is too dry for the hunters to move silently, etc. Therefore what changes seasonally are the *conditions* of hunting but not the game available.

In short, it becomes apparent that the seasons oblige the Aka to modify hunting techniques and this entails variations in the type of game obtained. Spear-hunting, based on reading tracks and locating feeding grounds, is easiest during the rainy season. Trapping, also based on tracking, is a substitute for spear-hunting and is practised under the same conditions, during the same

season. Monkey hunting with cross-bows is most favourable at the end of the dry season when fruit are ripening. Net-hunting also seems to be preferable during the dry season, when there is no risk of rain damaging the nets.

Nevertheless, none of these constraints implies impossibility. A social factor, however, comes into play. The fact that different techniques necessitate the participation of different numbers of hunters allows the Aka to choose the most appropriate method according to the number of people present (Table 6.2).

Mobility

Every Aka residential group, composed of twenty or so people, moves an average of eight times a year. Successive campsites for a given group are generally about an hour-and-a-half's walk (6–7 km) apart. In this way, the group can cover up to 60 km a year (Bahuchet 1979). There is no notable seasonal variation in moving frequency.

Nowadays, the moves are directed towards two poles: areas with a high density of caterpillar trees during the wet season, and sedentary villages for clearing fields during the dry season (at least every other year) (Fig. 6.11). It is really only the caterpillar season that necessitates moving camp, no other activity really requiring seasonal migrations. Wherever the campsite may be, the surrounding area is used for foraging.

Does the two-month period, the average occupation of a given site, correspond to the time it takes to deplete the resources of a given area? Such a question is difficult to answer as many factors other than food supply may intervene. For instance, a move may be decided for social reasons (e.g. quarrels or deaths) or because of physical comfort (e.g. the abundance of chigoe fleas,

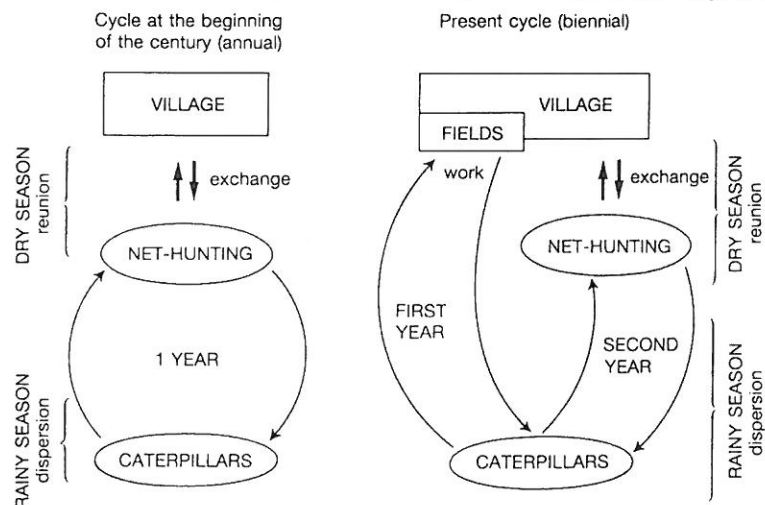


FIG. 6.11. Evolution of the cycle of Aka activities.

Tunga penetrans, in an old camp). Moreover, Aka diet is not composed solely of wild products, and two months is only an average, the extremes varying between 15 days to 6 months.

Fluctuations in diet

Foods vary the same way that activities change over the course of a year. Figure 6.12 gives the frequencies of various foodstuffs in meals, as observed in seven households in 1976 during 10 periods totalling 80 days.

First, it is evident that products of agricultural origin (starchy foods as cassava, plantain, yam and taro, cassava leaves, and palm oil) are always present in equal proportions to wild products. Rather surprisingly, we find that wild yams are comparatively rare (an average of 4 per cent) and show no clear seasonality, being on the contrary amazingly irregular, a fact which implies a marked uncertainty for this product. Uncertainty is also apparent in meat consumption, which varies at random from a minimum of 18 per cent to a maximum of 78 per cent, with the average being 32 per cent, except for the 6 per cent in August when 61 per cent of all the meals contain caterpillars, a distinctly dominant food source during the rainy season.

The fluctuation in the presence of wild liana leaves (*Gnetum* spp.) is not explained by seasonality but rather by easy access to cassava leaves, since these two resources are permanent and interchangeable. The frequency of mushrooms (13 per cent of all the meals) is fairly constant and any irregularities can be attributed less to seasonality than to the fact that no one bothered to look for them. At the other extreme are certain highly seasonal products, i.e. honey (22 per cent of all dry season meals)¹ and oleaginous nuts, used as condiments. Among these latter, a predilection for *Irvingia excelsa*, present in an average of 11 per cent of all meals (maximum 42 per cent) is evident, while the consumption of other species is staggered throughout the year. The case of palm oil is different since there is a clear correlation between its appearance in meals (21 per cent of the yearly average but up to 62 per cent) and the proximity of the villages. Moreover, this correlation is also true for cassava leaves and plantains. When the camp is far from the village, cassava starch is brought back, but in meals eaten near villages, plantains are more common. (Figure 6.12 indicates the walking time between camps and villages for each observation.)

If the frequencies on some of the graphs in Fig. 6.12 exceed 100 per cent, it is because meals contain more than one component and therefore the sum of these in each case is greater than the number of meals.

Another point should be made about meat fluctuation. If we compare the meal graph with the activity one (Fig. 6.10), we find that the maximum frequency of meat corresponds to the period of net-hunting, implying that this technique is more efficient than the others for it is carried out more intensely.

¹ It should be noted that in 1976 honey gathering began before June, as the ritual is now obsolete and no more restrictions apply to honey.

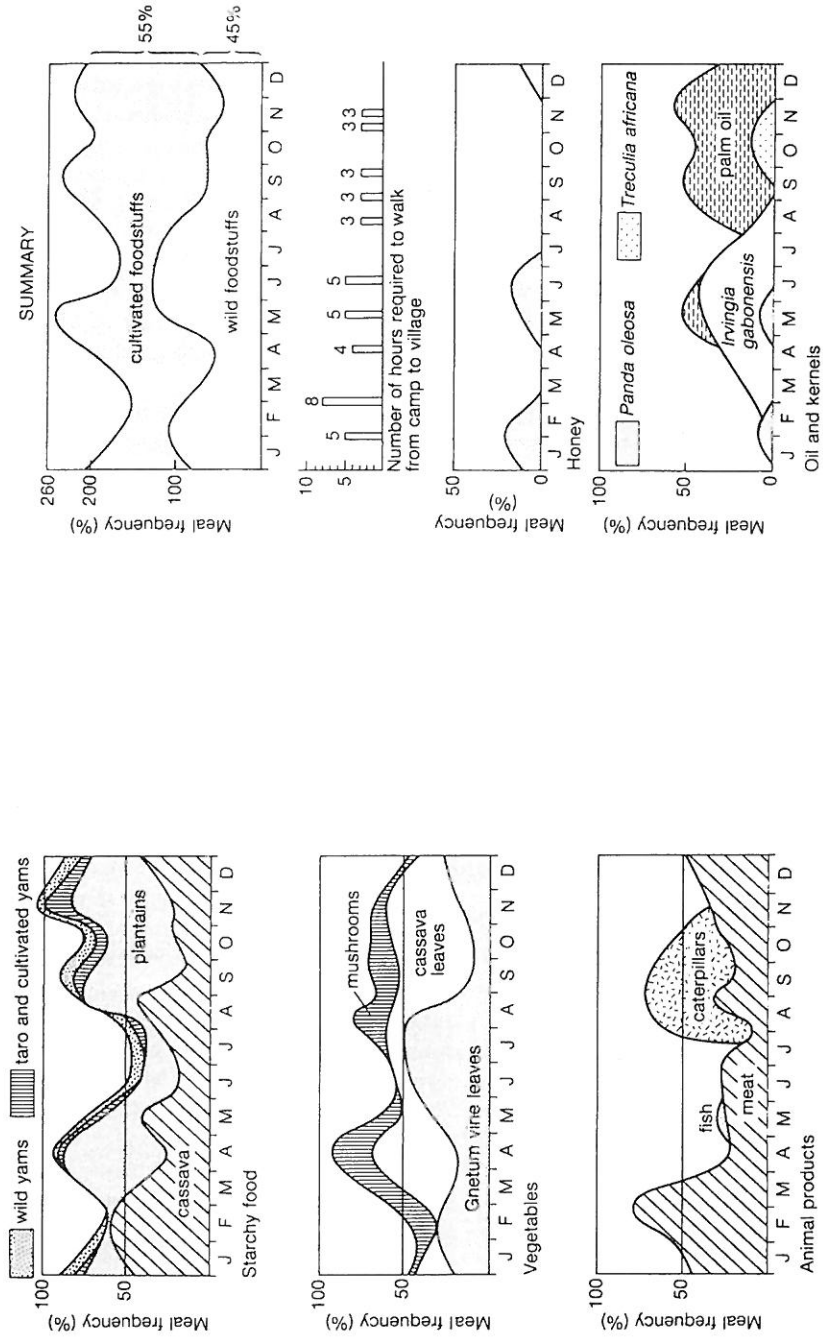


FIG. 6.12. Food frequency curves for a camp of seven families based on 80 days of observation, covering 409 meals, in 1976.

REDUCING UNCERTAINTY

Now that we have reviewed the perceptible variations in food resources and temporal modifications in food-getting activities, we shall consider the notion of food supply *uncertainty* among the Aka. The availability of products likely to be gathered may vary in space and time. The only way to increase the chances of having these foods at one's disposal is to increase the area where foraging is practiced or at least that which is explored for potential food sources.

Supplying meat depends, first of all on the land available for hunting. The greater the area, the more mobility can compensate for the lack of game near a campsite. It depends, secondly, on technical strength and above all on the presence of the number of partners required to make a specific type of hunting efficient. It follows that the two conditions necessary for reducing food supply uncertainties are having enough land available for foraging and the right number of partners to collaborate with. Later, I shall examine the social mechanisms that help satisfy both these conditions.

What is uncertainty for an Aka?

To answer this question, we must determine the goods and materials that the Aka consider indispensable to normal life and that they cannot forgo without feeling harmed in some way. For this, I shall examine successively what goods circulate and what alternative foods exist.

Without going into detail (this will be the subject of a future study), we can say that the *circulation of goods* is assured by descent relationships, by marriage, and also, beyond the domestic sphere, by exchanges with villagers.

The most evident circulation is that of *food*. At mealtimes, the observer is struck by the comings and goings of children carrying enamel dishes from one hut to another. This sharing among the consumer group is preceded by that among the production group and then among the family group. At this ultimate stage, each woman who has cooked a meal gives a portion to every hut in the camp, therefore to every conjugal family, including eventual visitors. In this way, every hut receives several plates of food every evening.

The *circulation of objects* seems to be more important, since this goes beyond the limits of the residential group. Within the camp, objects, although individually owned, can be used freely by anyone who needs them. When elders visit a camp, however, their younger kin may give them objects made by village craftsmen [e.g. weapons (spears), tools (knives, axes), and cooking pots], which are subsequently removed from the original residential group.

Marriage alliances entail another type of goods circulation. Marriage begins with a long period called 'courtship' (or 'marriage service') during which the husband inhabits his in-laws' camp and works exclusively for his father-in-law, giving him all the meat he hunts and the honey he gathers. But besides regularly

supplying meat, the young man and his family have to bring the in-laws a net, an axe, and several spear blades.

To delimit what is essential in the Aka's eyes, I will consider their *food preferences*. Meat comes first. When they are hungry, they are 'meat hungry', but there is a hierarchy in the kinds of meat they consume. The most noble game is obtained by spear-hunting. Next comes that caught with nets and finally that caught with bare hands. This last category contains giant rodents, large birds, and tortoises, which are hardly even considered as game. In Aka, the categories are 'spear flesh', 'net flesh', and 'meat by hand'. This disdain for certain animals is expressed verbally (e.g. 'The adults only captured tortoises but we children saved the day by killing a red hog') and also in food prohibitions. An active hunter is not allowed to eat an animal he has killed himself, unless it is a minor one caught by hand. Only a few foodstuffs are considered as meat substitutes: certain mushrooms cooked in large amounts, and *Irvingia* kernels.

Honey is another highly valued food source of symbolic importance, and the only one whose gathering is preceded by a ritual, and a collective one at that. It is also the only product gathered essentially by men. In oral literature (songs, myths), honey appears as a vital positive principle, and honey-gathering, done by boring a hole into the hive, is assimilated to penetrating a woman, to the primordial sexual act. There is no substitute for honey, but particularly sweet fruits, evocative of the sweet taste of honey, are also highly prized. This is the case of the very sweet *Synsepalum longecuneatum*, whose taste remains in the mouth and flavours everything eaten after it. It is also considered a powerful aphrodisiac.

Plant foods that are gathered (yams, leaves, nuts, mushrooms) are also ranked by preference, in such a way that the few species that are actually consumed are far from equalling the large number of edible plants that could be identified by an ethnobotanical survey (Table 6.3). Secondary species are used to replace preferred ones when these are not available. The use of secondary foods is illustrated by the bivouac meals that men have to prepare when

TABLE 6.3. Wild plant food preferences.

Rank*	Roots	Leaves	Kernels	Fruit	Total
Essential	7	2	1	—	10
Major	—	1	3	3	7
Minor	—	3	5	5	13
Occasional	2	2	2	5	11
Rare	—	1	3	5	9
Total	9	9	14	18	50

* Essential: consumed daily whenever possible; major: relished and sought after; minor: relished but not sought after; occasional: 'bivouac foods' when come upon; rare: mentioned as edible but consumption never observed.

they are away from camp hunting large mammals. They collect *Irvingia* nuts, mushrooms, and honey and dig up *Gnetum* rhizomes as substitutes for yams. They also consume the offal of the animals they kill, keeping the smoked meat to take back to camp.

Essential goods

To resume the above, it has been noted that *food supply*, especially meat, is a constant preoccupation. The fear of running out, of being 'meat hungry' (*péné*), of 'shortage' (*pósá*) is the Aka's first concern. The primacy of meat is also underlined by the fact that only hunting, except for honey collecting, is preceded by special rituals: likewise, only when hunting proves unsuccessful are rites required to restore normal order. On the contrary, gathering is never an occasion for ritual ceremonies (Bahuchet 1985; Thomas and Bahuchet, 1987).

The Aka, however, are bothered by other problems, especially the *acquisition of iron*, a material which is the basis for their *whole food production* process and one which they do not know how to forge. It is significant that the word used to designate 'riches' (even though goods are not accumulated) is the term meaning 'forged iron', *ditòli*. For the Aka, a lack of iron leads to technical impossibilities and therefore to food shortage¹.

To obtain a spouse is, in Aka society, both necessary and obligatory. The unmarried are considered asocial, nasty, and, as such, a threat to the well-being of the community. Moreover, they are economically deficient since the couple is the basic unit of production. Sexual relations are obligatory, as they are the means of perpetuating the group. Abundance (and food) and fecundity are closely linked, not only in the course of each individual's life (success in hunting being a prerequisite to marriage and a guarantee of its stability) but also on a religious and symbolic plane. This dyad—food (meat) and sexuality—is therefore necessary for the prosperity of the community.

Meat, iron, a spouse: these three elements are the essentials of *life*. All the Aka's efforts, all their social mechanisms, are concentrated on guaranteeing each individual access to these primary necessities.

It becomes apparent, then, that for the Aka supplying food is only part of a more complex system, where problems of uncertainty are interdependent. This can be schematized as depicted in Fig. 6.13.

¹ The importance given to iron tools may seem surprising since the Aka do not know how to produce them (this reinforces their dependence on other societies). But this corresponds to a *reality*: none of the Aka can do without iron; none of them can survive outside the influence of the villagers; not one of them can seriously imagine living without iron, even if there were adequate wooden substitutes (a pointed hard wood pike instead of an iron-bladed spear, a robust cudgel instead of an axe for breaking open bee nests). No stone tool is still in use in the present nor was in the recent past. It seems vain to speculate, as does Turnbull, on how Pygmies could live without iron. Their dependence is a *fact*, not a possibility, and this dependence would seem to exist from time immemorial as no stone tools remain. Undoubtedly, this need for iron is one of the reasons why the Aka maintain relations with non-Pygmie villagers.

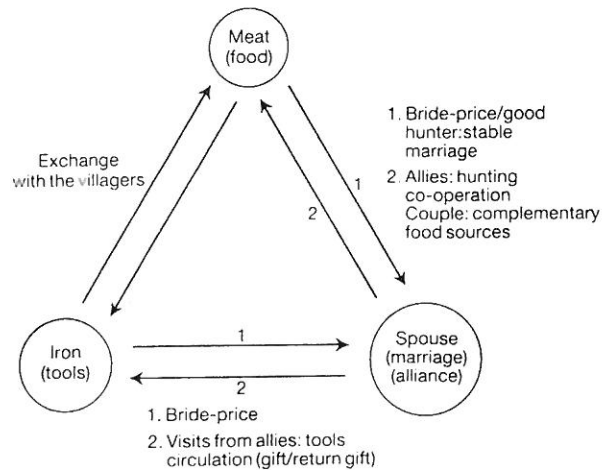


FIG. 6.13. Aka socio-economic system.

Resources, risk, and mutual aid

To qualify these major pre-occupations among the Aka, I will employ the notion of *risk*, as it was defined by Wiessner (1977) for the Bushmen hunter-gatherers. Risk is the probability of an unfortunate occurrence, that is, anything which can be detrimental to the survival and reproduction of an individual and his family. Therefore, because risk is expressed as a probability, the more one is exposed to certain circumstances, the more the dreaded event becomes likely. Wiessner describes a method for reducing risk by *pooling*, by combining a sufficient number of independent exposure units to make loss more predictable. 'The predictable loss is then shared proportionately by all those in combination and uncertainty is reduced (by the law of large numbers). Essentially what pooling of risk does is to substitute small definite losses with larger, more definite ones' (1977, p. 9).

She goes on to explain that if risks, beyond what can be handled by subsistence strategies, threaten the survival and reproduction of a single family, this family, unable to prevent or overcome them, will try to minimize probable 'losses' by establishing social ties based on mutual obligations with similar units. Pooling to reduce food supply uncertainty is evident at the camp level, where food sharing among all the families present assures even the most unlucky of having something to eat.

The relationship between the elder and younger members of a family illustrates one of these obligations. A young man supports his parents when they grow old. At a primary level, he is of course 'paying back the debt' he contracted as a child. But he is also reciprocating for a more social obligation: the meat

he furnishes his parents compensates for the material goods they provide him with so that he can acquire a wife. The contribution of the elders is also moral, in that they advise and protect the younger members of the group.

As far as meat is concerned, *the obligation to share without return* means that an individual's loss is sustained by the group and thus each hunter is assured of obtaining a portion of meat, even if he returns from hunting empty-handed.

In Aka society, portions of food are not distributed outside the camp, meaning that individuals must join a group in order to avoid food shortage. This is certainly not the case as far as implements are concerned. More precisely, acquiring tools, as it does not depend on Aka technical skill, is more delicate and necessitates a *circulation* network, whereas meat requires a *mutual aid* network. This circulation network is partially based on birthright and sibling relations. The first and most immediate way, however, of forming this network is by marriage which, though it may result from sister exchange, entails the distribution of bride-wealth. This alliance of two large family groups or camps gives rise to temporary associations for hunting activities (if it does not already result from them). The circulation network coincides in this instance with the aid network. In the same way, *visits* between in-laws are important opportunities for access to other resources. During their stay, newcomers receive gifts and exploit the local resources, since they are required to participate in food-getting activities just like any other household in the camp.

When it appears that lasting visits and technical associations are carried out permanently within a complex of two or three nearby camps linked by certain marriage ties, we can consider this a case of 'pooling risk'. One-way distribution of tools by younger men to their elders is offset by the free use of these implements within the camp. Moreover, the process of spear lending has a double advantage. First of all, it allows a younger man to use a weapon belonging to an elder and thereby to provide meat for his group. It also permits someone incapable of hunting to participate in the exchange system, by the fact that, as the owner of the spear, he is in charge of distributing the meat. Marriage, which maintains a regular relationship between two family groups, thus establishes a mutual aid network, which appears sufficient for solving ordinary food supply problems either directly by food sharing or indirectly by making available the necessary implements.

A second aid network is based on the existence of *patrilineal descent groups*. By birth, each individual, male or female, belongs to the lineage of his or her father, but also has the right to assistance from his or her mother's, grandmothers', and great grandmothers' lineages. Marriage creates ties with two new descent groups; those of the spouse's mother and father. These relationships make it possible to go stay in a camp where at least one member of one of these ten lineages resides. When this occurs, the newcomers perform the same activities as the residents of the camp. As every local group is made up of adults belonging to several different lineages (generally from 5 to 10 traced

through men as well as women), lineages extend over very large areas and the probability is high that a traveller will meet someone from his 'lineage network'. This network is, first of all, a way of creating kin-like relationships with individuals too remote to belong to one's classificatory kin group. This way of integrating distant relatives into one's 'family' has been described among other hunter-gatherers, although the processes may differ (Wiessner 1977). The second possibility given by this network is that of emigration. A conjugal family or even an entire group may abandon one territory for another in cases of serious conflict with another family or group or with villagers. Such a move is a rare though dramatic event and is made possible by this type of social organization.

To sum up, pooling risk seems to be a strategy existing among the Aka as well as among numerous other hunter-gatherers. It is through marriage alliances that pooling risk is made possible, for marriage is not only the starting point for the circulation of iron tools so essential to food production but also the means of ensuring the presence of partners for collective hunting, and, finally, it constitutes the symbolic foundation upon which all Aka life is based. Security in the face of uncertainty is thus guaranteed in times of crisis by a system of patrilineal descent groups.

Uncertainty and subsistence strategy

To resume what has been described above, variations in food supply, although only one of the problems which bother the Aka, arise mainly because results are unpredictable. Seasonality is not as such an uncertainty factor. The means implemented for reducing unpredictability are both technical and social.

As far as *gathering* is concerned, the basic rule is to be permanently aware of what is available at any given time and to collect it as soon as possible. This is easier when a large range of products are considered edible. Potential increases of explorable areas by means of alliances can alleviate serious shortages. But in everyday practice, the extent of the area prospected, for example for leaves and tubers, is proportional to the number of individuals actively foraging. In the case of resources such as mushrooms, caterpillars, termites, and some fruits that are perishable and/or only available for a limited period of time, gatherers work together to collect as much as possible as rapidly as they can. The availability of certain of these resources can be prolonged by processing them in various ways [caterpillars are smoked and dried, *Irvingia* kernels are pounded and dried in bars (Bahuchet and Thomas 1985)].

Hunting is a classic example of an activity where success is unpredictable, and the uncertainty of results maximal, even when the hunters are extremely skilled. The Aka fully acknowledge this fact, since they surround hunting, and only hunting, with numerous and complex rituals, and since only hunting enters into the social structure (initiation rites and marriage practices; cf. Bahuchet 1985). The first way of countering this uncertainty is to acquire and apply a

vast wealth of ethnoethological knowledge, thus making the hunter more attentive to the natural elements that will help him locate his quarry. To increase the probability of encountering game, hunting occasions are multiplied (note that in the rain forest, unlike in the savannah, few animals live in herds and their territories are very extensive). Since the area of forest explored during a collective hunt is much greater than that covered by an individual hunter alone, it is important, on the one hand, to live in a camp with a sufficient number of adult men and, on the other, to keep up regular relations with neighbouring camps whose members can co-operate periodically in joint hunting ventures. Each individual hunter's technical skill, as well as his weapons and knowledge of the forest and its inhabitants, augment the chances of obtaining meat. Another way of making success more probable is by diversifying hunting methods in the course of the day, i.e. individual hunts at dawn and dusk and collective hunts during the hot midday hours. The system of sharing and obligatory circulation of meat and cooked food helps make up for inadequate supplies and minimizes failures. Lastly, thanks to certain short-term methods of preserving meat (smoking and drying), delayed and untallied exchanges with agriculturists are feasible and thus the possibilities of food assistance are extended beyond the limits of the original group.

It must be emphasized that the richness of the flora and the fauna as well as the wide variety of items included in their diet keep the Aka from being dependent on only one or a few particular resources, and this probably prevents them from suffering seasonal hunger with physiological effects (cf. Pagezy 1982).

DISCUSSION

What conclusions can be drawn from these data? We have seen that the tropical forest, despite being undeniably rich in species, presents noteworthy variations in food resource availability, variations which men have to deal with. Seasonality, however, is not the main variable.

We have also seen that the Aka possess technical means allowing them to overcome these variations in availability. There is, however, a gap between what could be expected and what has been found. The social practices of the Aka focus more on the access to and the distribution of tools than on those of food. For the Aka, uncertainty is located primarily at this level and therefore it is not, according to *them*, essentially concerned with food.

Uncertainty and social structure

Does food supply uncertainty influence Aka social structure? In particular, is the fusion-fission process of the group connected with seasonality?

Modifications of group size and structure correspond to the periodic

regrouping of neighbouring camps, in more or less large numbers (cf. Fig. 6.9). This process is similar to what is usually known as 'fusion-fission', but differs largely in its modalities from the 'flux' described by Turnbull (1968) among the Mbuti (for more on this see Bahuchet 1979, 1985). The principal difference is in the notion of *band*. What constitutes a stable unit among the Mbuti and is fragmented at certain seasons is only a periodically unstable association for the Aka, whose basic unit is the *camp*, characterized mainly by patri- or bilineal descent. It is indeed the camp that forms the fundamental socio-economic unit, whatever the hunting activity may be, and this structure, which seems to correspond well to spear-hunting, continues nowadays even though this kind of hunt has lost its importance or even disappeared altogether. The grouping of three or four camps corresponds to the size necessary for the most efficient net-hunting, but its seasonal aspect is not quite clear. The Aka assert that the dry season is the most propitious for this kind of hunting. It is also true that this season is particularly unfavourable for both spear-hunting and trapping (its modern equivalent). It is again true that the villagers, who own most of the nets, do not utilize them during the dry season, as they are too busy clearing their fields. This brings up the question of Pygmy/villager relations, which I shall discuss below.

As no other activity coincides with or even necessitates a modification of social structure, we shall have to answer our initial question negatively. Neither seasonality nor, more largely, food supply uncertainty *directly* influences the social structure.

In my search for additional arguments, I will turn to other more well-known Pygmies, the Mbuti of the Ituri forest (Zaire). They are ecologically very similar to the Aka, being hunter-gatherers in a forest environment, at the same latitude with a comparable tropical climate. This is also the case of the Baka Pygmies in southeast Cameroun, but to date not much has been published on them. On the contrary, other African hunter-gatherers live in the savannah, e.g. the Hadza and the !kung San, at very different latitudes.

It is only quite recently that papers discussing seasonal variations in Mbuti activities have appeared (Harako 1976; Ichikawa 1978). The Mbuti living in the northern part of the Ituri forest are archers, while those in the centre and the southwestern regions are net-hunters. For the later, the dry season (December-March) is marked by long stays in large camps in the forest, far from the villages, for net-hunting. When the first rains come (March-June), although hunting is still practiced, the major activity becomes honey collecting (generally about May). During this period, large camps tend to split up into smaller ones. When the great rains come (August-November), dispersed camps get closer and the Mbuti work in the villagers' fields, hunting from time to time with nets and spears but usually individually with bows. The Mbuti who live by bow-hunting, however, maintain smaller camps throughout the year than do the net-hunters, and it is during the honey season that these camps form larger ones and carry out another type of collective hunt.

Much has been written about the importance of the honey season (Turnbull 1965; Godelier 1974; Harako 1976; Ichikawa 1981). It is, as we have seen, during this period that the greatest difference between net-hunters and archers becomes evident. Authors have rightly emphasized what the breaking up of the large camps into smaller units means and have explained that, in particular, it is a safety valve for reducing the tensions which can arise in everyday life when there are many people. This dispersal is named by the Mbuti, and by Turnbull after them, 'the good parting'.

But this contrast between archers and net-hunters, both fond of honey, also indicates that this period is only the *occasion* and not the *cause* of dispersal or regrouping. It is all the more evident since Ichikawa (1981) emphasizes that the present trend among net-hunters is not to divide up camps but only to send out task-groups for a few days. This enables them to 'produce' meat continually and satisfy the increasing demands of trade.

Finally, among the Aka and Mbuti Pygmies, as among all other hunters and gatherers where this phenomenon has been described, alternating fusion and fission corresponds to *social necessity*. As early as 1904, Mauss had already formulated such a law: 'Social life does not remain on the same plane throughout the whole year. Rather it goes through successive and regular phases of increasing and decreasing intensity, of rest and activity, of spending and repairing'. Seasonal (and foreseeable) variations in resources just give an *opportunity* to respond to this necessity, merely provide a season conducive to its fulfillment.

Uncertainty, and relationships with villagers

Since we have seen not only that the techniques and wild resources vary throughout the year but also that cultivated foodstuffs obtained from villagers occupy an important place in Aka diet, we are led to wonder what the influence of food supply uncertainty may have or, even more, may have had on the Aka's way of life. More precisely, is food supply uncertainty sufficient to explain aid networks and the *extension of these networks outside Aka society* to non-Pygmy villagers? In other words, could the present dependence on agriculturalists be due to the insufficiency of wild resources?

In whatever way we choose to study a Pygmy group, we are inevitably confronted with the major problem of relations with non-Pygmy peoples (Bahuchet 1984).

This situation is all the more puzzling because all the Pygmy groups presently known in equatorial Africa maintain complex economic relations with the neighbouring agriculturalist populations. In addition to this, recent field research in Asia has revealed that there too forest hunter-gatherers are similarly dependent on agriculturalists (for the case in the Philippines; see Peterson 1978; Griffin 1981; for Malaysia, see Endicott 1974).

However, two facts must be acknowledged: first of all relations between Pygmy, hunter-gatherers and village agriculturalists are far from exclusively

/A

based on food dependence. Numerous material items are included—mainly iron tools—and also immaterial entities (e.g. magic and medical practices). Secondly, economic relations between hunter-gatherers and agriculturalists or pastoralists have been well described in several other parts of the world, in contexts much vaster than the tropical rain forest. Likewise, the insertion of hunter-gatherers into complex trade networks has also been treated (for African prehistory, see Miller 1969; for East Africa savannahs, see Blackburn 1982; for the Bushmen, see Schrire 1980, Parkington 1980; for India, see Fox 1969, Morris 1983; for Canadian Indians, see Leacock 1954, Ray 1974).

It appears more and more likely that present villager-Pygmy relations, which vary significantly in their modalities and details from one end of the forest to the other, have a long history, and also that past relationships probably were not identical to current ones. Clearly, socio-economic conditions and practices in the past were not what they are nowadays, but practically nothing is known about them (Bahuchet and Thomas, forthcoming). For instance, were cultivated foods involved in these exchanges? In any case, accepting the hypothesis that the need for food, resulting from deficiencies in the forest environment, served as the motive for contacts with non-Pygmies, is more or less conforming to a contemporaneous image of starving nomads seeking protection from prosperous sedentary farmers. In fact, it seems quite likely that the opposite was true. It was nomadic agriculturalists, running away from the savannahs, who entered the unknown and, in their eyes, hostile world of the forest and there sought help from professional forest hunter-gatherers!

Even so, at the end of this chapter, we are far from being able to answer all the questions raised by the existence of these perplexing relationships. . . .

ACKNOWLEDGEMENTS

The English version of this paper was prepared with the precious help and advice of Ann Cooper, whom I warmly thank here.

APPENDIX: MAJOR AKA GAME MAMMALS

Aardvark. *Orycteropus afer* (Pallas), Orycteropidae. kpɔ̀ɔ̀nà
 Giant ant-eater. *Manis gigantea* Illiger, Manidae. kélépá
 Little ant-eater. *Manis tricuspis* Rafinesque, Manidae. èkàdì
 Giant bat. *Hypsignathus monstrosus* Allen, Pteropidae. èndémà
 Bongo. *Boocercus euryceros* (Ogilby), Bovidae. mbòngò
 Golden cat. *Felis aurata* Temminck, Felidae. ndùkú
 Chevrotain. *Hyemoschus aquaticus* (Ogilby), Tragulidae. yékéké
 Chimpanzee. *Pan troglodytes troglodytes* (Blumenbach), Pongidae. sùmbù
 Guereza colobus. *Colobus abyssinicus occidentalis* Rochebrune. kálú

Red colobus. *C. pennanti oustaleti* (Trouessart), Cercopithecidae. jáú
 Duikers:

Black-backed d. *Cephalophus dorsalis* Gray, Bovidae. ngbómù
 Black-fronted d. *C. nigrifrons* Gray. mòngzòmbè
 Blue d. *C. monticola* (Thünberg). mbólókó
 Gaboon d. *C. leucogaster* Gray. hêngé
 Peters d. *C. callipygus* Peters. mósómé
 Yellow-backed d. *C. sylvicultor* (Afzelius). bèmbà

Elephant. *Loxodonta africana cyclotis* (Matschie), Elephantidae. nzòkù

Guenons:

Brazza's monkey. *Cercopithecus neglectus* Schlegel, Cercopithecidae. mósilà
 Greater white-nosed m. *C. nictitans* L. kóèi
 Lesser white-nosed m. *C. ascanicus schmidti* Matschie. gbéti

Mona monkey. *C. pogonias grayi* Fraser. màmbè

Gorilla. *Gorilla g. gorilla* (Savage & Wyman), Pongidae. èbóbó

Red hog. *Potamochoerus porcus porcus* (L), ngùá

Tree hyrax. *Dendrohyrax arboreus* (A. Smith), Hyracoidea. yòkà

Leopard. *Panthera pardus* (L.), Felidae. èmbòngò

Crested mangabey. *Cercocebus albigena* Gray, Cercopithecidae. ngàtà

Grey-checked mangabey. *C. galeritus agilis* Riviere. èsàdù

Mongoose. *Bdeogale nigripes* Pucheran, Viverridae. mòéngè

Herpestes naso (De Winton). ngándá

Ichneumia albicauda (G. Cuvier). mòéngè

Brush-tailed porcupine. *Atherurus africanus* Gray, Hystricidae. ngòm bá

Giant gambian rat. *Cricetomys emini* Wroughton, Cricetidae. gbè

Giant forest squirrel. *Protoxerus stangeri* Waterhouse, Sciuridae. bòkó

Sititunga. *Tragelaphus spekei gratus* Sclater, Bovidae. mbùdià

REFERENCES

- Bahuchet, S. (1972). Etude écologique d'un campement de Pygmées Babinga (Lobaye, RCA), Paris. *J. Agric. Trad. Bot. Appl.* XIX(12), pp. 509-59.
 — (1978). Contraintes écologiques en forêt tropicale humide: l'exemple des Pygmées Aka de la Lobaye, Paris. *J. Agric. Trad. Bot. Appl.* XXV(4), pp. 257-85.
 — (1979). Utilisation de l'espace forestier par les Pygmées Aka, chasseurs-cueilleurs d'Afrique Centrale, Londres, Sage. *Social Sci. Informations* 18, pp. 999-1019.
 — (1984). Circulation et échanges chez les chasseurs-cueilleurs et les proto-agriculteurs forestiers (RCA), Sao Paulo. *Revista de Prehistoria* 6, pp. 86-97.
 — (1985). *Les Pygmées Aka et la forêt Centrafricaine: ethnologie écologique*. SELAF, Paris.
 — and Guillaume, H. (1982). Aka-farmer relations in the Northwest Congo-basin. In *Politics and history in band societies* (eds. E. P. Leacock and R. B. Lee), pp. 189-211. Cambridge University Press, Cambridge.
 — and Thomas, J. M. C. (1985). Conservation des ressources alimentaires en forêt tropicale humide: chasseurs-cueilleurs et proto-agriculteurs d'Afrique Centrale. In *Les techniques de conservation des grains à long terme* pp 15-31. CNRS, Paris.

- Bahuchet, S. and Thomas, J. M. C. (forthcoming). Linguistique et histoire des chasseurs-cueilleurs Aka (RCA), Cologne. *Sprache und Geschichte in Afrika*.
- Blackburn, R. (1982). In the land of milk and honey: Okiek adaptations to their forest and neighbours. In *Politics and history in band societies* (eds. E. P. Leacock and R. B. Lee), pp. 283–305. Cambridge University Press, Cambridge.
- Catinot, R. (1970). Premières réflexions sur une possibilité d'explication physiologique des rythmes annuels d'accroissement chez les arbres de la forêt tropicale africaine. *Bois et forêts des Tropiques* issue 131, pp. 3–36.
- Cloarec-Heiss, F. and Thomas, J. M. C. (1978). *L'aka, langue bantoue des Pygmées de Mongoumba (Centrafrique): introduction à l'étude linguistique; phonologie*. SELAF, Paris.
- Demesse, L. (1980). *Techniques et économie des Pygmées Babinga*, Institut d'Ethnologie, Paris.
- Endicott, K. (1974). *Batek negrito economy and social organization*. PhD thesis, Harvard University, Cambridge, MA.
- Fox, R. G. (1969). 'Professional primitives': hunters and gatherers in nuclear South Asia. *Man in Asia* 49, pp. 139–60.
- Godelier, M. (1974). Considérations théoriques et critiques sur le problème des rapports entre l'homme et son environnement, Paris. *Social Sc. Information* XIII(6), pp. 31–60.
- Griffin, P. B. (1981). *Northeastern Luzon Agta subsistence and settlement*. Philipinas.
- Harako, R. (1976). The Mbuti as hunters: a study of ecological anthropology of the Mbuti Pygmies (Ituri). *Kyoto University African Studies* X, pp. 37–99.
- Hladik, A. (1978). Phenology of leaf production in rain forest of Gabon: distribution and composition of food for folivores. In *The ecology of arboreal folivores* (ed. G. G. Montgomery) Washington Smith. Inst., pp. 51–71.
- (1982). Dynamique d'une forêt équatoriale africaine: mesures en temps réel et comparaison du potentiel de croissance des différentes espèces. Paris. *Acta oecologica: oecologia generalis* 3(3), pp. 373–92.
- , Bahuchet, S., Ducatillon, C., and Hladik, C. M. (1984). Les tubercules de la forêt dense d'Afrique Centrale, Paris, *Revue d'Ecologie, la terre et la vie* 39, pp. 249–90.
- Ichikawa, M. (1978). The residential groups of the Mbuti Pygmies, Osaka. *Senri Ethnological Studies (Africa)* 1, pp. 131–88.
- (1981). Ecological and sociological importance of honey to the Mbuti net hunters—Eastern Zaïre, Kyoto. *African Study Monographs (Kyoto Univ.)* 1, pp. 55–68.
- Leacock, E. P. (1954). The Montagnais 'hunting territory' and the fur trade. *Am. Anthr. Ass. Memoir* 56(5).
- and Lee, R. B. (eds.) (1982). *Politics and history in band societies*. Cambridge University Press, Cambridge.
- Longman, K. A. and Jenik, J. (1974). *Tropical forest and its environment*. Longman, London.
- Mauss, M. (1904). Essai sur les variations saisonnières des sociétés eskimos: études de morphologie sociale. In *Sociologie et ethnologie* (1966), pp. 389–477. PUF, Paris.
- Miller, S. F. (1969). Contacts between the later Stone Age and the Early Iron Age in Southern Central Africa. *Azania* 4, pp. 81–90.
- Miracle, M. P. (1961). 'Seasonal hunger': a vague concept and an unexplored problem. Dakar, *Bull. IFAN, série B* XXIII, pp. 273–83.
- Morris, B. (1983). The family, group structuring and trade among the South Indian hunter-gatherers. In *Politics and history in band societies* (eds. E. P. Leacock and R. B. Lee), pp. 171–87, Cambridge University Press, Cambridge.
- Owen, D. F. (1976). *Animal ecology in Tropical Africa*. Longman, London.
- Pagezy, H. (1982). Seasonal hunger, as experienced by the Oto and the Twa of a Ntomba village in the equatorial forest (Lake Tumba, Zaïre). *Ecology of food and nutrition* 12, pp. 139–63.
- Parkington, J. E. (1980). L'Afrique méridionale: chasseurs et cueilleurs. In *Histoire générale de l'Afrique, vol. II: Afrique ancienne* pp. 695–727. UNESCO, Paris.
- Peterson, J. T. (1978). Hunter-gatherer/farmer exchange. *American Anthropologist* 80, pp. 335–51.
- Ray, A. J. (1974). *Indians in the fur trade. Their role as trappers, hunters and middlemen in the lands southwest of Hudson Bay, 1660–1870*. University of Toronto Press, Toronto.
- Schrire, C. (1980). An inquiring into the evolutionary status and apparent identity of San hunter-gatherers. *Human Ecology* 8, pp. 9–32.
- Thomas, J. M. C. and Bahuchet, S. (1987). Pygmy religions. In *The Encyclopedia of Religion* (ed. M. Eliade), 12, pp. 107–10. MacMillan, New York.
- Turnbull, C. M. (1965). The Mbuti Pygmies: an ethnographic survey, New York. *Anthropological papers of the Am. Mus. of Nat. Hist.* 50(3), pp. 140–282.
- (1968). The importance of flux in two hunting societies. In *Man, the hunter* (eds. R. B. Lee and I. de Vore), pp. 132–7. Aldine, Chicago, IL.
- Wiessner, P. W. (1977). *Hxaro: a regional system of reciprocity for reducing risk among the !kung San*. PhD thesis, University of Michigan.