

## VARIABILITY IN THE SUBSISTENCE ACTIVITIES AND DISTRIBUTION OF FOOD AMONG DIFFERENT AGED MALES OF THE AKA HUNTER-GATHERERS IN NORTHEASTERN CONGO

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**ABSTRACT** Among the hunter-gatherers of Africa, the disparity in the individual catch of large animals is well known. This disparity is, generally, attributed to the individual hunting skill or chance. Although the yields from hunting and honey collecting by the Aka hunter-gatherers in northeastern Congo also show considerable disparity, these differences are partly due to economic and social factors. One such factor is age, on which this paper is focused. Based on the quantitative data obtained in a 14-months field study, I analyzed the differences in the amount of meat and honey acquired by each age group and the distribution of meat and honey between the age groups. The data showed that the interdependence among different age groups was created through the distribution. This interdependence through mutual distribution performs the important role of maintaining the cohesion of the camp members.

**Key Words:** Aka hunter-gatherers; Hunting; Honey; Age difference; Distribution; Social cohesion.

### INTRODUCTION

There are many reports concerning the sexual division of labor among the hunter-gatherers of Africa (Turnbull, 1965; Lee, 1968; Woodburn, 1968; Tanaka, 1980; Bahuchet, 1985). Little attention has, however, been paid to the role differentiation due to age, except for brief accounts on children and old people who do not much participate in subsistence activities. It is said that in these societies, the social division of labor is not developed, and anyone can do anything indispensable for daily life (Woodburn, 1982; Ichikawa, 1991). It is also reported, however, that there is a considerable variability in the catches of individual hunters. Among the !Kung San in Kalahari, only one man hunted three quarters of the total meat brought to the camp during four weeks (Lee, 1979). There is also a remarkable disparity among the net hunters of Mbuti (Ichikawa, 1983).

Such disparity is either attributed to the individual hunting skill, or simply to chance. Among the San, there is clear difference in individual skill in the use of bow and arrow hunting (Lee, 1979). Although not much skill necessary for net hunting as practiced by the Mbuti, a considerable variability in the individual catches may result merely by chance within a short period (Ichikawa, 1983).

The yields from various subsistence activities practiced by the Aka hunter-gatherers also show considerable individual differences. These differences are,

however, not simply due to individual skill or chance, but economic and social factors seem to be involved. In this paper, I will focus on age, which influences the individual economic and social condition. While individual catches vary with age among San hunters (Lee, 1979), this difference is mainly due to physical strength, skill and wisdom of experience. In this paper, first, the differences in the yields of the two major subsistence activities of the Aka men, hunting and honey collecting, are described in relation to age groups. Secondly, the distribution of food among different age groups is analyzed. Based on the above, the changes in the contribution to subsistence activities through life, the interdependence between different aged men, and ecological and social aspects of food distribution are discussed. These are indispensable for understanding the economic and social relationships among the Aka.

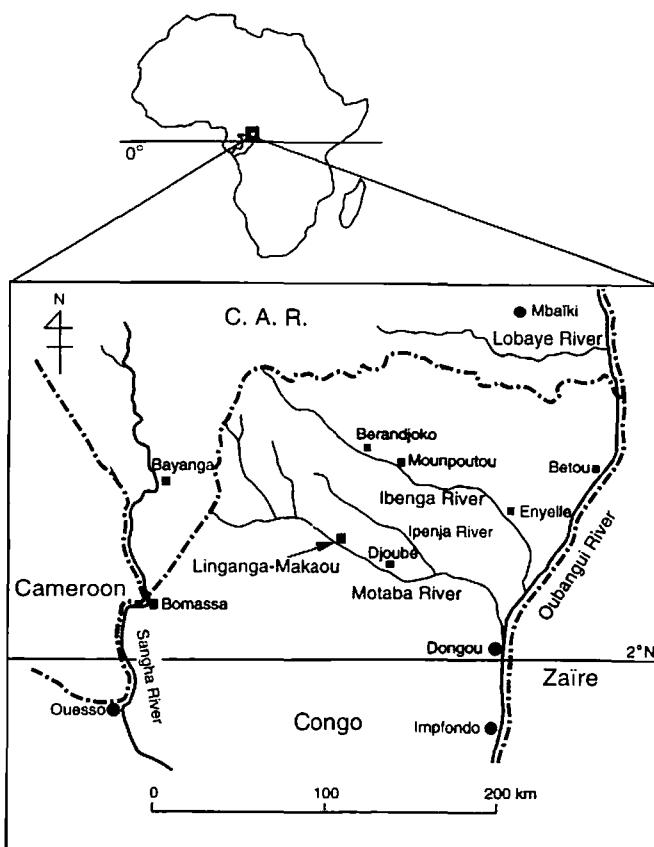


Fig. 1. The study area.

## STUDY AREA AND PEOPLES

The Aka live in the forest area of northeastern Congo, southern Central African Republic, and on the eastern bank of the Oubangui River in Zaire (Bahuchet, 1985). Their estimated population is 15,000 to 30,000 (Bahuchet & Thomas, 1986). They speak a Bantu language belonging to the C 10 group, according to the classification by Guthrie (1967-1970).

Field research was conducted from October 1991 to November 1992 in the vicinity of Linganga-Makaou village, the uppermost village on the Motaba River (Fig. 1) in the Dongou District, Likouala Region, of Congo ( $2^{\circ}55'N$  Lat. and  $17^{\circ}10'E$  Long.). Complementary research was conducted from August to November 1995. Linganga-Makaou village was founded by Ikenga slash-and-burn cultivators who speak a Bantu language belonging to the C 10 group.<sup>(1)</sup> There were approximately 200 Ikenga people in the village.

The mean annual rainfall is 1,698.9 mm at Impfondo (1980-1990), the capital of Likouala Region, about 145 km south-east of Linganga-Makaou village. There are two seasons in a year: the dry season from December to February, and the rainy season from March to November. The mean annual temperature is  $25.4^{\circ}C$  and the monthly mean temperature changes little throughout the year. Other ethnographic accounts of the area and peoples have been given in previous papers (Kitanishi, 1994, 1995).

## THE STUDY SUBJECT AND METHOD

The Aka of Linganga-Makaou spend four to eight months a year in the forest, and stay around the village during the remaining months. There are nine village camps, in which approximately 340 Aka live. I conducted field research mainly among the Molongo group<sup>(2)</sup> (hereafter, M group), which consisted of 81 members and was the largest in Linganga-Makaou. M group members moved between the forest and village, sometimes splitting into small groups which merged into a large group after a period.

Life in the forest camp is quite different from that in the village camp (Kitanishi, 1995). The Aka depend on wild food hunted and collected in the forest, whereas in the village they mainly eat agricultural food acquired from the villagers and the meat hunted with villagers' guns. In this paper, hunting and gathering in the forest camp are analyzed.

Bahuchet (1985), Hewlett (1991) and Takeuchi (1994) have described the age classes of the Aka of southern C.A.R. and the Ibenga area of northeastern Congo. Their age classes are similar to those in Linganga-Makaou, except for a little difference in dialect. A brief account of male age classes is given here.

The infants who have not begun walking are called *mo. lepe*.<sup>(3)</sup> Children over one year of age begin walking, and are called *mo. ana*. Adolescents who participate in collective spear hunting are called *mo. pondi*. Men change their age class from *mo. ana* to *mo. pondi* approximately between 12 and 15 years old. Generally, a man first marries when he is called *mo. pondi*. When a man improves his

Table 1. Male members of M group.

	age	age class	age group*	wife	days	spear	net(m)	wire
M1	12,3	<i>mo.pondi</i>	young	0	52	?	0	0
M2	15	<i>mo.pondi</i>	young	0	24	?	0	0
M3	15	<i>mo.pondi</i>	young	0	52	?	0	0
M4	20	<i>mo.pondi</i>	young	**	62	?	0	0
M5	20	<i>mo.pondi</i>	young	0	52	1	0	0
M6	20	<i>mo.pondi</i>	young	**	53	?	0	0
M7	20	<i>mo.pondi</i>	young	1	19	0	0	0
M8	25	<i>mo.pondi</i>	mid	1	35	n?	0	0
M9	25	<i>mo.pondi</i>	mid	1	53	1	0	0
M10	25	<i>mo.pondi</i>	mid	1	35	2	0	0
M11	30	<i>mo.pondi</i>	mid	1	46	2	0	13
M12	30	<i>bayanji</i>	mid	1	25	1	0	0
M13	30	<i>bayanji</i>	mid	1	64	2	41.5	11
M14	35-40	<i>bayanji</i>	old	1	33	2	0	3
M15	35-40	<i>bayanji</i>	old	1	35	1	26.5	0
M16	40-45	<i>bayanji</i>	old	1	40	1	28.5	24
M17	40-45	<i>bayanji</i>	old	1	60	2	0	17
M18	40-45	<i>bayanji</i>	old	1	54	2	15.0	28
M19	50	<i>bayanji</i>	old	0	29	1	0	n?
M20	50	<i>bayanji</i>	old	1	55	1	47.0	n?
M21	60	<i>bayanji</i>	old	1	92	1	51.0	23

Note: A *mo. pondi* whose leg was injured is excluded from the analysis in this paper; \*: Age group used to analyze the subsistence activities and distribution: young-younger-aged man, mid-middle-aged man, old-older-aged man; \*\*: They married during the research period; n?-They had spears or wire but the numbers were unknown.

hunting skill, especially in spear hunting, and kills many bush pigs, he is called *bayanji*, "adult man." Approximately between 25 and 30 years old, he changes his age class from *mo. pondi* to *bayanji*. As a man grows older, he stays in the camp throughout the day without participating in the hunting and collecting activities, when he is called *mo. koto*, "retired old man."

In this paper, the activities of the men in the two age classes of *mo. pondi* and *bayanji* are analyzed. M group was comprised of 10 *bayanji* and 11 *mo. pondi*<sup>4)</sup> men (Table 1). While actual ages could only be roughly estimated, age order was more reliable, because the men knew relative age among themselves. When their age order was unknown, it was estimated from the ages of their children or grandchildren.

In this paper, I divide *bayanji* and *mo. pondi* into three groups of older-aged, middle-aged and younger-aged men, to analyze the differences in the two male subsistence activities of hunting and honey collecting. The division between *bayanji* and *mo. pondi* depends on the experience in spear hunting, which is the most appreciated male subsistence activity among the Aka. It is not, however, important in terms of their subsistence at present. Division into three age groups is more appropriate for explaining the difference in subsistence activities as shown later, although actually, the subsistence activities of Aka men gradually change as they grow.

While the nominal givers and receivers in the distribution of food are young and

Table 2. Study periods in the forest camp.

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Total
period from	11 Nov. 91	15 Dec.	10 Feb.	29 Jun.	25 Aug.	10 Oct.	
to	16 Nov.	10 Jan. 92	22 Feb.	9 Jul.	13 Sep.	24 Oct.	
days	6	27	13	11	20	15	92
average camp size	74.0	66.6	20.6	15.8	41.7	59.5	
person-days*							
O-household	165	669.5	106	88	207.5	259	1,495
M-household	69	254	39	28	174	151.5	715.5
Y-household	27	162	6	3	114	139.5	451.5
F-household	51	166	38	11	115	117	498
Total person-days	312	1,251.5	189	130	610.5	667	3,160

\*: An adult over 12 years old is calculated as one person, an infant or juvenile from 2 to 11 as half an adult, and a baby under 2 as 0 adult.

old men as well as women, most of the meat and honey are actually received by adult women,<sup>(5)</sup> who cook and redistribute them. In this paper, I use the term "household" as a unit of analysis of the distribution. Household composition is either an adult woman, her husband and their unmarried children, or a widow and her unmarried children.<sup>(6)</sup> Aka households are thus classified into four types: that with an older-aged man, that with a middle-aged man, that with a younger-aged man and that without any older-, middle- and younger-aged man.<sup>(7)</sup> Hereafter, they are called O-household, M-household, Y-household and F-household. The difference in the yield of meat and honey a man is able to obtain is associated with their age and hence the disparity in the amount of meat and honey acquired by each household type before the distribution.

Although polygyny is permitted among the Aka, adult men rarely have more than one wife actually. None of the men has plural wives in M group (Table 1). M19 had lost his wife, and left M group for his new wife's camp in April 1992. M5 moved to his new wife's camp in April 1992, but soon divorced and returned to M group in July 1992. M1, M2 and M3 had not married.

I stayed at the forest camp of M group for 6 periods (from Period 1 to 6), for a total of 92 days (Table 2). The hunting was analyzed for all 6 periods, while honey collecting was analyzed for the Periods 4, 5 and 6, because honey collecting was clearly seasonal (Kitanishi, 1995).

All the meat and honey brought to the camp were weighed with spring balances. The hunting method, the hunters and honey collectors and their formal owners were also identified. For meat distribution, givers, receivers and parts given were recorded. Not all the distributed meat was directly weighed. For the meat not directly weighed, estimates were used from the weighed sample. For the distribution of honey in the camp, only the givers and receivers were identified. Weight of honey distributed was estimated from the total weight divided by the number of distributed portions (in glass, or in a packet of Marantaceae leaves).

**Table 3.** Weight of meat acquired by each hunting method.

hunting	spear hunting	net hunting	trap	others	Total
weight (kg)	179.60	118.85	1048.70	51.40	1,398.55
percent	12.8	8.5	75.0	3.7	100

## HUNTING

### I. Major Hunting Method

A brief account of major Aka hunting methods is given before discussing the individual differences in hunting activities (for detailed information, see Demesse, 1980; Bahuchet, 1985, 1992; Kitanishi, 1995; Takeuchi, 1995b).

Spear hunting is practiced by a group of *mo. pondi* and *bayanji*. The group size for spear hunting was from 3 to 13 (mean = 6.0). In spear hunting, the Aka first trace animal footprints, then find an animal, and spear it. The major game is the bush pig. Gorillas are also hunted with spears, but only occasionally. The Aka used to hunt elephants with spears scores of years ago.

Net hunting is practiced by a group of young and old men as well as women. The group size for net hunting was from 21 to 31 (mean = 25.4). The hunters set the nets, beat the bush, kill animals entangled in the net, rewind the nets, and then move on to the next site. After several hunting attempts, they return to the camp. Generally, *mo. pondi* and *bayanji* set the nets and beat the bush, whereas women wait around the nets, then capture the animals caught in the net. The major targets are small- and medium-sized duikers such as blue, Peters' and bay duikers.

The Aka use several kinds of traps, among which the spring trap is most important in the study area. Generally, men set and patrol the traps. When an animal is too large to carry by himself, women are called for help. At present, steel wires are mainly used as loops for the spring traps. However, twisted cords of the raffia palm fiber or wild vine fiber are also used when steel wire is not available. The major targets are yellow-backed duikers, Peters' duikers, bush pigs and giant forest hogs.

The game hunted with traps comprised the most important source of meat supply (three quarters of the meat yield recorded in the six periods) in the study area (Table 3). The game hunted with spears and nets contributed to only about 10% of the total meat yield. Other hunting activities, such as crossbow hunting and capturing with bare hands are not important. This is different from the case of the Aka in Lobaye of C.A.R. and Ibenga where net hunting is most important (Bahuchet, 1985; Takeuchi, 1995a).

### II. Distribution of Meat

Distribution operates on the following three levels. First, the butchered meat is distributed among the hunters according to the roles they played during the hunt. This distribution is obligatory and follows strict rules. The meat distributed in this fashion is called *mo. bando*. Hunted animals are not brought to a specific place or

man. "The owner" (*konja*)<sup>(8)</sup> of the hunted animal is the owner of the tool which immobilized the animal (Bahuchet, 1990). The owner, his wife or his child generally butchers and distributes the animal.

Then, the butchered meat is distributed from *konja* or these receivers in the first distribution to those present at the camp. This second distribution is neither obligatory nor follows strict rules. Even myself and other temporary visitors are included in this distribution.

The third is the distribution of cooked meat from wives of *konja*, or these receivers of meat in the first or second distribution to those present at the camp. Women stew the meat with some plant food, then serve it on plates, lids of pots or leaves of Marantaceae to the men who collectively eat at the male dining place. Some women also receive the same food. The remaining portions in the pot are eaten by the cook and her children. This distribution is neither obligatory nor follows strict rules. According to Bahuchet (1990), in Lobaye, male members took meals around their houses separately, but in northeastern Congo, they ate together at the central hut in the camp called *mbanjo* (Takeuchi, 1995a). The third distribution was excluded from this analysis, because the plant foods collected by women were usually cooked with meat before the distribution. The entire distribution process of food will be described and analyzed in a forthcoming paper.

It is reported that about half of the meat obtained by the Aka in Lobaye is exchanged with the neighboring cultivators, who sell it to the traders from the towns (Bahuchet, 1990). In northeastern Congo, however, the Aka seldom exchanged meat with the neighboring cultivators and consumed it by themselves (Kitanishi, 1995; Takeuchi, 1995b).

The animal species and the techniques used to kill the game determine the detail of the first distribution. In spear hunting, the owner of the spear with which the first blow is struck to an animal (even if it is not fatal) is the owner of the animal. If the hunted animal is a bush pig, the owner of the spear of the second blow is given its waist (*mbanja*), and the owner of the spear of the third blow is given its head (*mo. soko*). When the first blow to a bush pig is dealt with a borrowed spear, the borrower obtains its hip (*mbangu*). All remaining parts belong to the owner of the spear of the first blow. If the hunted animal is a gorilla or chimpanzee, the owner of the spear of the second blow obtains its leg (*e. belo*). If the hunted animal is a yellow-backed duiker, he obtains its waist. If the hunted animal is a small- or medium-sized duiker, he obtains its chest (*lombo*) and head.

In the net hunting, the owner of the net in which an animal is caught is the owner of the animal. The person who actually seizes the animal is given its chest and intestines (*mese*). The one who sets the net is given the head of the animal. Occasionally, a man ties a loop of string (*mo. kodi*) to the net as a charm for a good hunt. When an animal is caught in such a hunt, the one who tied the *mo. kodi* obtains the tail and hip. When an animal is killed with a spear before being caught in the net, the owner of the spear is the owner of the animal. The one who actually spears the animal receives its head, but all remaining parts are taken by the owner.

In trapping, the owner of the trap which catches an animal is the owner of the animal. Nobody is under the obligation to give away parts of the trapped animal in the first distribution. Curiously, the one who finds the trapped animal or helps

the owner to carry it to the camp is given no meat in the first distribution.

The rules of the first distribution in Linganga-Makaou are different from those in Lobaye (Bahuchet, 1985). Also, among the Mbuti in eastern Zaire, the rules of the first distribution vary throughout the region (Turnbull, 1965; Harako, 1976; Tanno, 1976; Ichikawa, 1983).

Animals hunted with spears and traps are generally brought to the front of the owners' houses, and butchered there. Then butchering, the first and second distribution take place. Animals hunted with nets are butchered by the wives or close female relatives of the owners in the forest, and the first and second distribution are carried out there. Those who received some portion of the meat hunted with spears and traps in the first and second distribution often redistribute it to other camp members. Also, animals hunted with nets are again distributed in the camp. These distributions were, however, excluded from this analysis, because it was difficult to follow the detail of such redistribution.

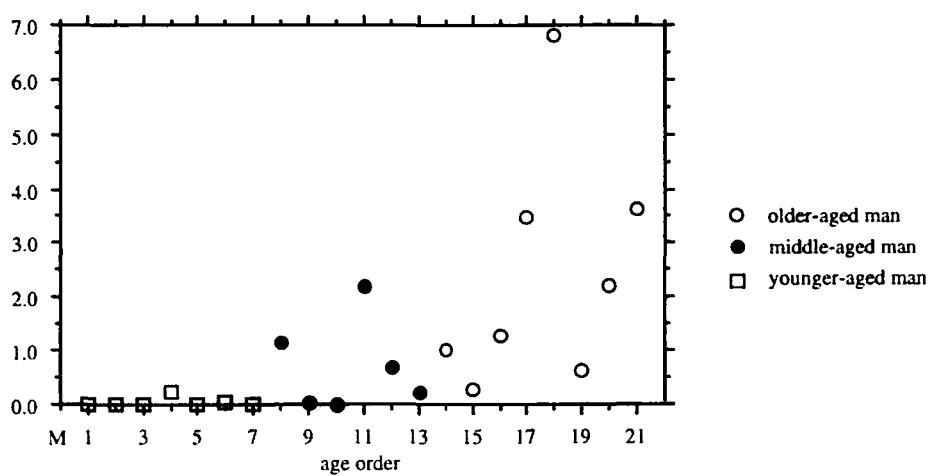
### III. Disparity in the Catches

The amount of meat obtained by each of the age/sex groups was a bit different

Table 4. Weight (kg) of meat of each age/sex group before and after the first distribution.

	older-aged men	middle-aged men	younger-aged men	male children	women	unknown	Total
before	1191.75	183.25	18.00	0.75	4.80	0.00	1398.55
after	1141.58	177.42	19.85	1.75	22.55	35.40	1398.55

kg / day



Kruskal-Wallis test  $H = 11.9$ ;  $p < 0.01$

Fig. 2. Meat acquired by each man after the first distribution (kg/day).

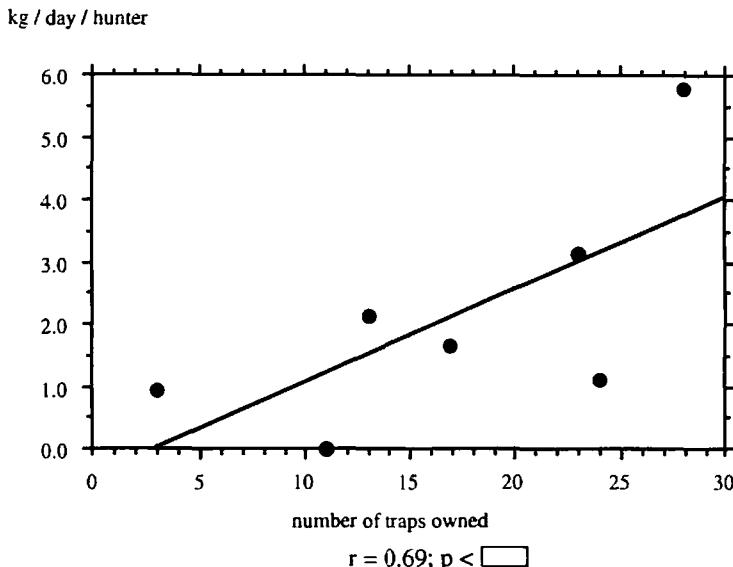


Fig. 3. Correlation between the number of traps and amount of meat yields from trapping.

before and after the first distribution except for that of women (Table 4), because the ratio of meat shared in the first distribution was quite small as described in the next section. Therefore, the amount of meat obtained by each man after the first distribution is analyzed in this section. Men, especially older-aged men, supplied most of the meat to the camp, whereas women supplied only a small part.

Figure 2 shows the daily amount of meat obtained by each man after the first distribution. Older-aged men gained much more meat than others (average for older-aged men was 2.61 kg per day, that for the middle-aged 0.69 kg, that for the younger-aged 0.06 kg. Kruskal-Wallis test,  $p < 0.01$ ). Three of the seven younger-aged men acquired no meat, whereas all older-aged men acquired at least some meat. The older the man, the greater amount of meat he acquired (Kendall rank correlation coefficient,  $\tau = 0.589$ ,  $p < 0.001$ ).

The most important factor for such differences between the three age groups was the possession of hunting tools. Steel wire is generally used for spring traps at present. Although string twisted from the fiber of raffia palm (*uondo*) is strong enough to catch bush pigs, steel wire is much stronger. Seven older-aged men out of eight had steel wires, whereas no younger-aged men did (Table 1). Two middle aged men had some steel wires but not much. The daily catches from the traps of the men who owned steel wires were much larger than those without steel wires (average for the men with wires was 2.04 kg per day, for the men without wires 0.06 kg, Mann-Whitney U-test,  $p < 0.001$ ).

The daily meat yield from the traps increased with the number of wire owned by each hunter (Fig. 3,  $r = 0.69$ ). This means that skill played little part in the amount of catch from trapping. Older-aged men, who had more wires than other men, naturally acquired more meat than others. The reason why the older-aged men

tended to have more wires is discussed later.

The possession of nets also differed between the age groups. Five older-aged men owned nets, while only one middle-aged man and no younger-aged man did. The daily catches from the net hunting of the net owners were much larger than those of the non-owners (average for the men with a net was 0.27 kg per day, for the men without a net was 0.01 kg, Mann-Whitney U-test,  $p < 0.0001$ ). Thus, in net hunting also, the ownership of hunting implement was the major cause of the variability in the individual catches.

Spear hunting was not so successful; only 4 out of 29 hunts were successful, where 5 bush pigs were killed. The success rate (the number of successful hunts to the number of hunts attempted) was as low as 0.14, which is much lower than that of net hunting (0.7).

M17 was the owner (*konja*) of 3 out of 5 bush pigs killed with spears. One of them was killed by another man with M 17's spear. M 17 also hunted two gorillas, but I was not at the forest camp and, hence excluded the case from the analysis. He was known as a highly skilled spear hunter. While only a part of men possessed wires and net, almost all men possessed one or two spears (Table 1). Therefore, the large variability in the individual catches for spear huntings was due to either the difference in hunting skill or chance.

#### IV. The Amount of Meat Distributed and Received

The amount of meat distributed in the first distribution was quite small, at 3.5% of the total meat (Table 5), since most meat was obtained by trapping which did not involve the first distribution. The first distribution was observed for the meat from net and spear hunting. In the first distribution of net hunting, the distribution to those who seized the animal entangled in the net was important, and the receivers of this distribution were usually women. This is the reason why the amount of meat for women increased after the first distribution (Table 4). While the net owners themselves usually set the nets (of 24 animals hunted with nets, 17 animals were caught in the nets which the owners set), the one who actually seized the animals in the net was usually some other person, not even the net owner's wife (19 animals among 24).

Although the amount of meat obtained by Y- and F-households increased after the first distribution, they were far less than that obtained by O- and M-households (Table 5). The first distribution seldom reduced the difference in the amount of

Table 5. Weight (kg) of meat given and received by each household type in the first distribution.

	O-households	M-households	Y-households	F-households	member of other camp	unknown	Total
before give	1175.05 (0.786)	185.80 (0.260)	3.10 (0.007)	0.00 (0.000)	0.00	0.00	1363.95
receive	40.78 (0.027)	7.38 (0.010)	0.00 (0.000)	0.00 (0.000)	0.00	0.00	48.16
after	8.73 (0.006)	6.45 (0.009)	7.00 (0.016)	2.05 (0.004)	23.13	0.80	48.16
	1143.00 (0.765)	184.87 (0.258)	10.10 (0.022)	2.05 (0.004)	23.13	0.80	1363.95

Note: Meat whose first distribution could not be followed (34.6 kg) was excluded from this table. Figures in the parentheses indicate the weight per person-day of each household type.

Table 6. Weight (kg) of meat given and received by each household type in the second distribution.

	O-households	M-households	Y-households	F-households	author and his assistant	unknown	Total
before	767.36 (0.513)	60.22 (0.084)	7.00 (0.016)	2.05 (0.004)	—	2.25	838.88
give	517.04 (0.346)	39.75 (0.056)	1.70 (0.004)	0.85 (0.002)	—	2.25	561.59
receive	175.10 (0.117)	175.24 (0.245)	62.64 (0.139)	79.27 (0.159)	40.26 (0.219)	29.08	561.59
after	425.42 (0.285)	195.71 (0.274)	67.94 (0.150)	80.47 (0.162)	40.26 (0.219)	29.08	838.88

Note: Meat whose second distribution could not be followed (599.67 kg) was excluded from this table. Figures in the parentheses indicate the weight per person-day of each household type.

meat between household types, because the ratio of meat shared in the first distribution is quite small.

In contrast, as much as two thirds of the total meat were distributed in the second distribution (Table 6). O-households obtained a large amount of meat before the second distribution, but, there was no difference between O- and M-households in the proportion of shared parts to the meat obtained before the second distribution (the proportion for O-households was 67.4%, that for M-households 66.0%). These suggest that whenever the Aka have some amount of meat, they distribute it to others. The proportions of Y- and F-households were low probably because they obtained only a small quantity of meat.

While O-households gained the largest amount of meat per person-day before the second distribution, they received the smallest amount of meat per person-day in the second distribution (Table 6). This means that the second distribution reduced the variation in the amount of meat between O-households and other households. Actually, O-households had 100 times more meat than F-households before the second distribution, while only 1.7 times as much after the second distribution. M-households received the largest amount of meat per person-day, although their amount of meat before the second distribution was much larger than Y- and F-households. This seemed to increase the difference in the amount of individual households after the second distribution. As a result of the second distribution, O- and M-households had about 1.5 times more than Y- and F-households. The difference in the meat quantity among four types of households, however, was finally reduced by the third distribution, which will be described in a forthcoming paper.

The amount of meat given to me per person-day after the second distribution was about the same as that of the M group households. This suggested that anyone who stayed at the camp could receive nearly the equal amount of meat to the camp members. Mere presence, regardless of contribution to the hunt, was enough reason for a share of the meat in the second distribution.

## HONEY COLLECTING

### I. Collecting and Distribution of Honey

The Aka collect the honey of honeybees (*Apis mellifica adansonii*) and more

than 8 species of stingless bees (Trigoninae). They fell a tree with an ax and the beehive is cut open on the ground to extract honey. If the tree is difficult to fell, or easier to climb, they climb it to extract honey from the beehive, and the honey is brought down in a container (for detailed information, see Bahuchet, 1985, 1992). While women occasionally help men make a container and prepare embers to smoke out bees, honey collecting is considered to be masculine work.

The person who first finds a beehive is "the owner" (*konja*) of the honey. If the honey is not collected immediately, a few shrubs around the tree with the beehive are broken to notify other persons that the honey there has already been found. This mark is called *mo. panje*.

Honey is partly eaten on the collecting site by all the people who are present, and the remainder is brought to the camp. All the honey is consumed on the site when the quantity is small. When the owner asks other Aka to collect honey, the collector brings back some portion for the owner waiting at the camp. The persons present at the collecting site (including the collectors) are often given some portions from the owner. The distribution from the owner to the collector is, unlike the case of the first meat distribution, neither obligatory nor follows strict rules.

Honey brought to the camp is distributed in two forms: unprocessed honey and honey mead called *njambo* (dissolved in water). Neither of these distributions is obligatory nor follows strict rules. Unprocessed honey is distributed in a glass or a packet of Marantaceae leaves. Honey mead dissolved in water in a large pot, prepared by women, is also distributed in a glass. Unlike cooked food, unprocessed honey is not brought into the men's place (*mbanjo*). Although *njambo* is occasionally brought into *mbanjo*, men generally drink *njambo* around their houses with their wives and children.

Thus, the distribution of honey also takes place in three steps, but slightly differently from that of meat: at the collecting site (first distribution), unprocessed honey in the camp by the owner and collectors (second distribution), and processed honey (honey mead, *njambo*) by women (third distribution). The only rule of honey distribution is that *konja* must obtain some portion of honey at the collecting site or in the camp. Although Bahuchet (1985) reported that there was no distribution of honey among the collecting group except for a collective meal at the collecting site, this was not the case in Linganga-Makaou, which will be discussed later. The distribution of *njambo* will be described in another paper, in conjunction with that of other cooked food.

## II. Individual Variability in the Honey Yield

Honey collecting has a clear seasonality. A large amount of honey was collected

Table 7. Weight (kg) of honey by collectors and owners of each age/sex group.

	older-aged men	middle-aged men	younger-aged men	women	other camp members	unknown	Total
collector	49.10	201.00	79.50	0.00	4.60	2.00	336.20
owner ( <i>konja</i> )	35.32	130.76	30.12	9.10	8.40	122.50	336.20

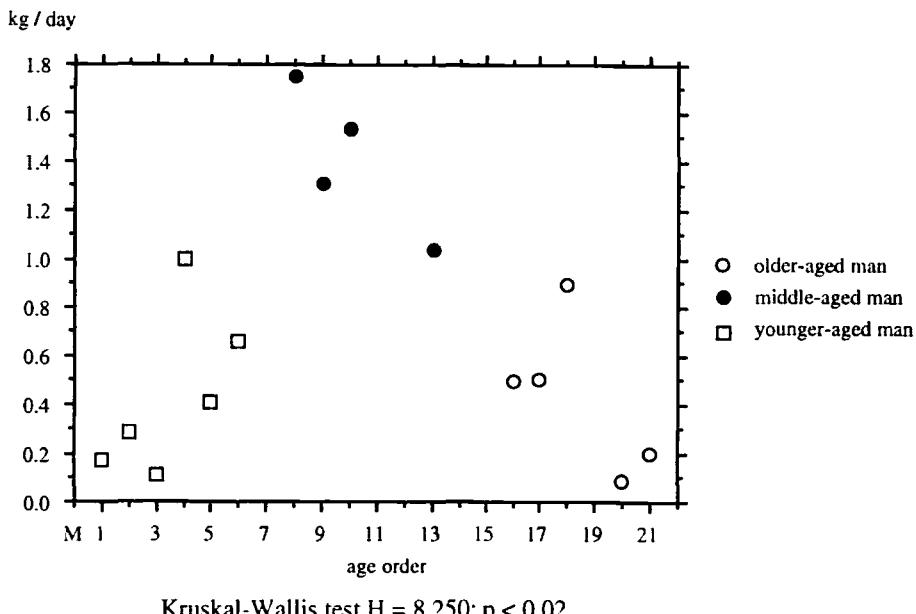


Fig. 4. Weight of honey collected by each man (kg/day).

in the 1992 rainy season (Periods 4, 5, 6), when the amount of honey collected and its distribution in the camp were recorded for a total 46 days. The owners of honey and the distribution on the collecting site were identified for 35 days in Periods 5 and 6.

While both men and women can be finders, i.e., "owners," only men, *bayanji* and *mo. pondi*, collect honey.<sup>(9)</sup> About 60% of the total honey was, however, collected and found (owned) by middle-age men (Table 7). While the amount of honey owned by the older-aged men was larger than that of the younger-aged, the amount of honey actually collected by the older-aged was smaller than that of the younger-aged men. This was because younger-aged men frequently collected honey for other Aka, whereas the older-aged men asked other men to collect the honey they found.

The daily amount of honey collected increased from younger-aged to middle-aged men, and decreased from middle-aged to older-aged men (Fig. 4). Middle-aged men collected a significantly larger amount of honey (average for older-aged men was 0.439 kg per day, that of middle-aged men 1.414 kg, and that of younger-aged men 0.441 kg, Kruskal-Wallis test,  $p < 0.02$ ).

Figure 5 shows the daily amount of honey found (owned) by each man. Again, middle-aged men owned the largest amount (average for older-aged men was 0.375 kg per day, that for middle-aged men 0.964 kg, and that for younger-aged men 0.713 kg, Kruskal-Wallis test,  $p < 0.1$ ). A considerable difference is found between the amounts of honey collected and owned by younger-aged men. In fact, M4 and M6 collected a large amount of honey found (owned) by other Aka (Fig. 6). This

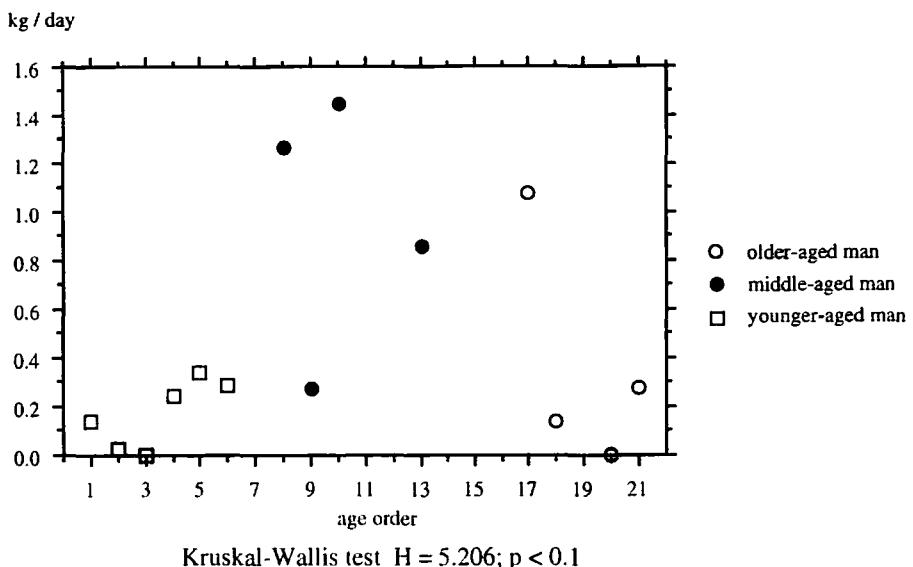


Fig. 5. Weight of honey owned by each man (kg/day).

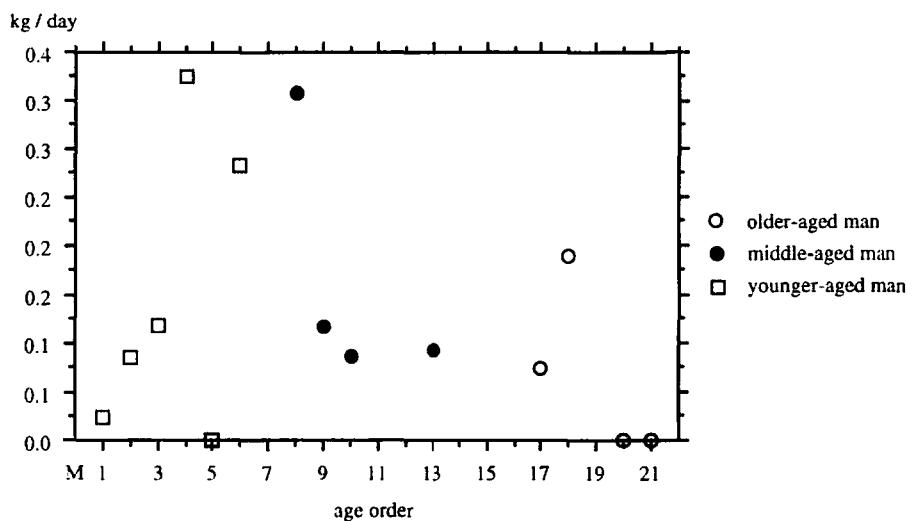


Fig. 6. Weight of honey collected by the men who are not the owner (kg/day).

indicates that the Aka men find beehives less frequently in their early youth and young Aka usually collect the honey found by other Aka. The ability to find beehive is acquired as they grow older and have more experience in the forest. There are some skills needed to find beehives: first, finding a hollow in a trunk, second, ascertaining that there is a beehive in the hollow with eyes (gazing at the

entrance of the hollow) or ears (hearing the sound of bees). Another way to find beehives is to search for fallen fragments of bees (*benji*) eaten by ants. Around *benji*, they look for a beehive in the trees. Aka women occasionally bring the soil to the camp to ask the adult men to see whether it contains *benji*.

The above reveals the relationship of honey collecting to Aka life history. While younger *mo. pondi* do not collect much honey, they specialize in collecting honey found by others because have little knowledge in locating beehives in the forest. Older *mo. pondi* find and collect honey themselves. The peak of honey collecting ability is reached by the final stage of *mo. pondi*. As they grow older and their physical strength and flexibility decline, they less frequently collect honey by themselves. Instead, they ask young *mo. pondi* to collect honey for them. As the men enter old age (*mo. koto*), they rarely go out to search for beehives.

### III. The Amount of Honey Distributed and Received

The honey owners (*konja*) distributed a fifth of honey collected (except for honey eaten on the spot) to those who were present at the collecting site (Table 8). When the honey eaten at the collecting site is taken into account, the proportion of the honey distributed to the total honey collected becomes higher. There is no rule that the owner should distribute honey at the collecting site, nor that collectors receive some honey. However, that honey is distributed to those present inevitably brings about some distribution to the collectors, because they are always present. In fact, 18 out of 22 collectors other than owners received some portion of honey. Seventy-six percent (33.15 kg) of the total honey distributed at the collecting site

Table 8. Amount of honey (kg) distributed to each household type at the collecting site.

	O-households	M-households	Y-households	F-households	member of other camp	Total
<i>konja</i>	42.30 (0.077)	145.55 (0.350)	10.65 (0.056)	6.80 (0.028)	8.40	231.70
give	16.15 (0.029)	16.75 (0.040)	0.55 (0.003)	1.50 (0.006)	8.40	43.35
receive	10.75 (0.020)	21.85 (0.053)	9.00 (0.047)	1.75 (0.007)	—	43.35
after	36.90 (0.067)	150.65 (0.362)	19.10 (0.100)	7.05 (0.029)	—	231.70
unknown*	52.45	53.70	7.65	8.70	0	122.50
bring**	89.35 (0.163)	204.35 (0.491)	26.75 (0.140)	15.75 (0.065)	0	366.20

Note: Figures in the parentheses indicate the weight per person-days of each household type. \*: The weight of honey whose *konja* is unknown and brought to the camp by the members of each household type. \*\*: The weight honey brought to the camp by the members of each household type.

Table 9. Amount of honey (kg) distributed to each household type in the camp.

	O-households	M-households	Y-households	F-households	member of other camp	Total
before distribution	57.40 (0.105)	176.35 (0.424)	13.10 (0.069)	10.30 (0.042)	0.00	257.15
give	43.83 (0.080)	129.78 (0.312)	8.63 (0.045)	7.75 (0.032)	0.00	189.99
receive	78.41 (0.143)	32.35 (0.078)	26.48 (0.139)	42.70 (0.176)	10.05	189.99
after distribution	89.53 (0.163)	81.37 (0.196)	30.95 (0.162)	45.25 (0.186)	10.05	257.15

Note: Figures in the parentheses indicate the weight per person-days of each household type. The weight of honey whose distribution is unknown (79.05 kg) is excluded from this table.

was received by the collectors (including their household members). Thus, the first distribution is "consequently" made according to the roles performed during honey collecting.

The amount of honey received by each household type in the first distribution is correlated with the frequency of participation in the collecting party. The amount of honey received in the first distribution per person-day by M-households was larger than that by other household types, and the amount of honey distributed by M-households was almost similar to that received by them (Table 8). The first distribution, thus, hardly reduced the difference in the amount of honey between the household types. The honey brought to the camp per person-day by Y-households increased because younger-aged honey-collecting men received honey from the owners, and because they rarely had others collect the honey they found.

In the camp, honey was again distributed to those who had not accompanied the honey collecting party. Table 9 shows the amount of honey shared and received in the second distribution by each household type. About three quarters of honey brought to the camp were distributed, and no difference was found among household types in the proportion of honey given in the second distribution. This suggests that whenever the Aka have some honey, they distribute it to others.

The second distribution of honey actually reduces the difference in the amount of honey among household types. In the second distribution, F-households with the smallest amount of honey per person-day, received the largest amount, and M-households, with the largest amount, received the smallest. Although F-households obtained larger amounts of honey, they actually ate about the same or lesser amount of honey than O- and Y-households, because they less frequently ate honey on the collecting site than the other household members. M-households obtained about 1.2 times as much honey as O- and Y-households after the second distribution. This difference was partly reduced by the third distribution, the distribution of honey mead.

## DISCUSSION

### I. Disparity in Meat Procurement

Older-aged men obtain the majority of meat after the first distribution. This disparity in meat procurement derives from the disparity in the possession of hunting implements, i.e. steel wires and hunting nets.

The Aka generally obtain steel wires from the villagers (of 20 Aka men, 16 got theirs from villagers, 2 from other Akas, 2 from outsiders). Through providing the labor for agricultural work, gun hunting and various other chores, Aka men form close relationships with specific villagers. Of the 16 Aka men who obtained steel wires from the villages, 11 got theirs from such villagers, called *nkumu*, 'patron.'<sup>(10)</sup> It suggests that a long-term relationship with the villagers is important in obtaining steel wires. The villagers originally had bought steel wires for their own use. But because gun hunting has spread among the villagers, they rarely use steel wires for hunts at present, and give away their wires to the Aka. Game hunted

with the Aka's own tools is not sold in the town along the Oubangui River because of the difficulty in transportation, and the Aka seldom exchange their meat with the villagers because the villagers now eat meat hunted with their guns (Kitanishi, 1994, 1995). The Aka can not, therefore, obtain wires in exchange for meat. Although steel wires are durable implements, the Aka seldom give away or exchange them with other Aka. These are the reasons why older-aged men usually have more wires.

A net is comprised of several parts obtained through different ways. While a part of the net is made by the net owner himself, the rest is given from other Aka. Nets, spear heads and ax blades are bridewealths among the Aka. Thus, a man with marriageable daughters has some chance to increase his net, although not always. Such a man is usually old. In contrast, a man who has a marriageable son may be asked for a net by the relatives of his son's wife. Even if the young man makes a net himself, it will be soon given away to the relatives of his wife. Nets, in any case, circulate mainly among the old men.

There is no disparity in the possession of spear heads and ax blades: almost all men have them. They are frequently exchanged as bridewealth or gifts, and circulate in large numbers among the Aka. The difference in the individual catches from spear hunting is, therefore, not due to the possession of tools, but to the hunting skill.

According to Woodburn (1982, 1988), hunter-gatherers with an "immediate return system" such as Mbuti of Zaire, !Kung San of Botswana and Namibia, and Hadza of Tanzania, use simple, easily acquired and replaceable tools to obtain food and other resources. As far as they depend solely on such tools, disparity cannot result from the possession of tools. Almost all the tools used by the Aka meet these conditions except for steel wires, which the older-aged men are most likely to obtain.

According to Ichikawa (1983), there is a large variability in the individual catches from net hunting among the Mbuti in a relatively short period. However, this difference is due to mere chance, since net hunting does not require much skill. Ichikawa (1983) assumed that individual catches would average out in the long run. Among the San, there is considerable variability in individual catches resulting from different skill-levels for bow-and-arrow hunting, a major hunting method (Lee, 1979). In these cases, economic or social condition does not seem to be involved in generating disparity in individual catches.

It is a general rule among the Mbuti and the San, as well as among the Aka that the owner of the game is the owner of the tool used in hunting, not the hunter who kill it. In the Mbuti net hunting, the owner of the animal is the owner of the net in which it is entangled, and the hunter who seizes it obtains only one hind leg (Harako, 1976; Tanno, 1976; Ichikawa, 1983). In the bow-and-arrow hunting of the San, the owner of the animal is the owner of the arrow with which the game is shot. The San frequently lend and borrow arrows (Lee, 1979), where the owner of the game is systematically separated from the man who hunt it. Ichikawa (1991) indicated that the separation of the owner from the hunter is one of the mechanisms which prevents concentration of meat to a specific skilled hunter. Among the Aka in the study area, however, the same rule facilitates the concentration of

game to the men who have more steel wires.

Trapping with steel wire originated from the villagers, and steel wires was probably introduced to the Aka 20 or 30 years ago in the study area. Although steel wires are the most important hunting tool, they have not been incorporated into the traditional marriage payment system. (For the relationship among bride-wealth, hunting and meat acquisition, see Bahuchet, 1985, 1988 and 1990). This is one of the major reasons for the infrequent circulation of steel wires. The major hunting method before the introduction of steel wires was spring traps made with twisted cords of raffia palm (*uondo*) fiber and net hunting. At that time, the difference in individual catches attributable to age may have been smaller than at present.

The villagers seldom hunt with steel wires at present because most now have guns. Therefore, the supply of steel wires from the villagers to the Aka could decrease in future. In 1994, the construction of facilities for Nouabalé-Ndoki National Park started in the village. Many villagers and Aka have been employed, and much cash flows into the village. This economic impact may influence the circulation of hunting tools among the Aka.

## II. Distribution of Meat and Honey

Bahuchet (1990) indicated that food distribution satisfied two complementary functions: a supplying function and a social function of group cooperation and cohesion. In the study of hunter-gatherers, food distribution is considered one of the method of "pooling risk" (Wiessner, 1982), by combining a sufficient number of independent units to reduce food supply uncertainty (by the law of averages): i.e. food distribution among the camp members assures even the most unlucky persons of something to eat (Bahuchet, 1988).

In Linganga-Makaou, however, the reduction of food supply uncertainty is not the only function of food distribution. The difference in meat and honey production between different aged males is based on the economic and social system of food production. In order for all camp members to obtain enough food, meat acquired by the older-aged men and honey acquired by middle-aged men must be distributed among all the camp members, because food is seldom circulated beyond the camp (Kitanishi, 1995). Interdependence of food among different aged men is indispensable from a nutritional point of view.

In Linganga-Makaou, the second distribution has the function to go round food in the camp, but the first distribution helps a little. (The third distribution also has this function, and it will be analyzed in the forthcoming paper). According to Bahuchet (1985, 1990), in Lobaye, some portions of meat are allotted to the whole camp members in the first distribution of spear hunting, assuring meat supply to the whole camp. In net hunting, however, no such distribution is made, which probably is related to the fact that net hunting originated from cultivators (Bahuchet, 1985, 1992). At present, in Linganga-Makaou, the first distribution in spear hunting and net hunting involves only the hunters who played the role in the hunting. Most of the meat goes to the owner.

At present, the major hunting method is net hunting in Lobaye. Therefore, the

supplying function of the first distribution may not be too important. But, Takeuchi (1995a) indicated that in Ibenga, where the major hunting method is net hunting, the first distribution of net hunting does assure that meat goes round in the camp because nets are frequently borrowed and lent by the Aka. Supplying function of the first distribution in Linganga-Makaou is less important than in other areas, because the major hunting method is trapping Linganga-Makaou and because meat from traps is not distributed in the first distribution.

According to Bahuchet (1985, 1990), the owner of the game and hunters who obtain a portion of meat in the first distribution must obey rules of distribution based on kinship in the second distribution, and elders mainly receive meat. In contrast, there are no such explicit rules in the second distribution in Linganga-Makaou. Meat is actually distributed to the young and temporary visitors (such as myself), as well as the elder relatives. Meat mainly flows from the older-aged men to others: i.e. from those who have to those who have not. The supplying function of the second distribution in Linganga-Makaou is more important than that in Lobaye and Ibenga. The difference in the importance of the supplying function between the first and second distribution is influenced by the hunting method.

In the Mbuti of eastern Zaire, the first distribution of honey is quite frequently carried out, as well as the second distribution (Ichikawa, 1981). Honey from 31 beehives out of 49 cut was collected by the people other than the owners in the Mbuti, while in Linganga-Makaou, collecting parties generally include the owners.<sup>(11)</sup> In the camp of the Mbuti, honey is distributed again, from those who have to those who have. Ichikawa (1981) indicated that the social aspect was more important than the nutritional aspect. Such frequent distribution may be because the Mbuti collect considerably larger amount of honey than the Aka (the Mbuti, 0.83 kg per person-day, the Aka in Linganga-Makaou, 0.18 kg).

Ingold (1988: 283) indicated that the cohesion of hunter-gatherer communities was attributable to "face to face relationships" which bound persons directly, as selves rather than as the occupants of positions in a rule-governed "social structure," e.g. kinship (stressed by Ingold). In Linganga-Makaou, no explicit and strict rules based on kinship is detected in the second distribution described in Lobaye by Bahuchet (1985, 1990). When I inquired to the Aka to whom to distribute meat and honey in the second distribution, they answered with the names of almost all the camp members. They do not follow strict rules, but decide whom to give meat and honey by themselves on the spot. Among the Aka of Linganga-Makaou, voluntary sharing based on autonomous individual decision generates a tendency where the second distribution assures that meat and honey flows from those who have to those who have not. Such sharing may be ascribed to keep the cohesion of the Aka community in the process of change in the main owners of meat resulting from the change in the major hunting method.

In the African hunter-gatherer societies, various leveling mechanisms operate to prevent the disparity in catches from creating distinctions of wealth, power and status (Woodburn, 1982; Ichikawa, 1991). Among the Aka in the study area, however, there is a large difference in the individual yield of meat and honey, which is dissolved only through the one-way distributions.

The change in hunting technique has been reported among the San in the Central

Kalahari (Osaki, 1984; Ikeya, 1989). Traditional bow-and-arrow hunting was replaced by spear hunting on horse back in the 1980s. As the game from this hunting method belong to the horse owner in principle, a small number of horse owners has obtained a great deal of meat. The change in San hunting method thus led to the individual difference in meat acquisition, which has created a one-way flow of meat distribution (Osaki, 1990; Tanaka, 1991). Besides hunting on horse back, hunting with dogs became very popular in 1987. The meat acquired with dogs is distributed equally among the participants. The reason for its popularity among the San seems to be related to the need to counter the imbalance in exchange brought about by hunting on horse back (Tanaka, 1991).

Among the Aka in study area, individual difference in meat acquisition and one-way flow of meat distribution from older-aged men to others, which has probably taken place for more than 10 years, do not seem to have generated a difference in wealth, power or status. The opposite one-way flow of honey from the middle-aged to the older-aged would partly counterbalance the flow of meat. However, the value of meat and honey among the Aka must be taken into consideration.

It is not always the case that food flows from those who have to those who have not in the second distribution. Curiously, a larger amount of meat is given to M-households in the second distribution than Y- and F-households, although M-households obtain larger amounts of meat even before the second distribution than Y- and F-households. This may be regarded as the reciprocity of O-households to the distribution of honey by M-households. The reason why the M-households do not give O-households more honey than F-household as the reciprocity of meat distribution is probably because the supplying function of the second distribution of honey is more important than that of meat, since all meat is redistributed after it is cooked i.e. in the third distribution, whereas less than half of honey is redistributed in the form of honey mead. In fact, the disparity in the amount of honey after the second distribution between household types is smaller than that of meat. The distribution of meat from O-households to M-households specifically creates the cohesion between O-households and M-households who play central roles in the production of meat and honey. The mutual distribution of food is one of the important economic factors in organizing social life of the Aka camp.

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formation about their life and every convenience in the field. To these persons, I am deeply grateful.

## NOTES

- (1) In the previous papers, I called the slash-and-burn cultivators in the Linganga-Makaou village, "Kaka" (Kitanishi, 1994, 1995). But "Kaka" was used by the colonial administration and the people called Kaka living in upper Motaba speak several kinds of language. The autochthonous name of the people in Linganga-Makaou is Ikenga.
- (2) The Aka camp has a central person called *kombeti*. Molongo was the name of the *kombeti* of this group. His name was used to denote the camp.
- (3) Italics denote the Aka language, however, phonetic transcription is not always completely accurate. The prefix and stem are divided by a period.
- (4) Plural of *mo. pondi* is *ba. pondi*, but *ba pondi* is not used in this paper for simplicity.
- (5) An adult woman indicates a married or once married woman.
- (6) Other household dependent such as a grandchild or a nephew is also included. There is no word for household in Aka.
- (7) The household with both older-aged man and younger-aged man is classified as O-household.
- (8) Although *konja* is translated into "acquereur," or "acquirer" in Bahuchet (1985 and 1990), in this paper, *konja* is provisionally translated as "owner." The concept of *konja* is very complex, and needs detailed study.
- (9) Although children younger than *mo. pondi* occasionally accompany the adults on honey collecting, they are excluded from the analysis because they do not actually contribute to honey collecting. When several men collected honey together, the total yield divided by the total number of *bayanji* and *mo. pondi* was regarded as the yield per day per collector.
- (10) Each Aka has one or several close villagers called *ukumu*. In this paper, *nkumu* is provisionally translated as 'patron.'
- (11) Sixteen collecting parties consisted of only the owners, 6 parties included the owners, and three parties did not include the owners. Of these three cases, the owners were women in two cases and the owner was a sick man in one case.

## REFERENCES

- Bahuchet, S. 1985. *Les Pygmées Aka et la Forêt Centrafricaine*. SELAF, Paris.
- 1988. Food supply uncertainty among the Aka Pygmies (Lobaye, Central African Republic). In (I. de Garine & G. A. Harrison, eds.) *Coping with Uncertainty in Food Supply*, pp. 118–149, Oxford University Press, Oxford.
- 1990. Food sharing among the Pygmies of Central Africa. *African Study Monographs*. 11 (1): 27–53.
- 1992. *Dans la forêt d'Afrique Centrale: les Pygmées Aka et Baka*. SELAF, Paris.
- Bahuchet, S. & J. M. C. Thomas 1986. Linguistique et histoire des pygmées de l'ouest du bassin Congolais. *Sprache und Geschichte in Afrika*. 7(2): 73–103.
- Demesse, L. 1980. *Techniques et Economie des Pygmées Babinga*. Institut d'Ethnologie, Paris.
- Guthrie, M. 1967–1970. *Comparative Bantu*, 4 vols. Gregg Press, Hants.
- Harako, R. 1976. The Mbuti as hunters: A study of ecological anthropology of the Mbuti

- pygmies (I). *Kyoto University African Studies*, 10: 37–99.
- Hewlett, B. S. 1991. *Intimate Fathers: The Nature and Context of Aka Pygmy Paternal Infant Care*. The University of Michigan Press, Ann Arbor.
- Ichikawa, M. 1981. Ecological and sociological importance of honey to the Mbuti net hunters, Eastern Zaire. *African Study Monographs*, 1: 55–68.
- 1983. An examination of the hunting-dependent life of the Mbuti Pygmies, Eastern Zaire. *African Study Monographs*, 4: 55–76.
- 1991. Egalitarianism in an evolutionary perspective (in Japanese). In (J. Tanaka & M. Kakeya, eds.) *Natural History of Mankind*, pp. 11–34, Heibonsha, Tokyo.
- Ikeya, K. 1989. Hunting activity of the Central Kalahari San (in Japanese). *Kikan Jinruigaku*, 20(4): 284–329.
- Ingold, T. 1988. Notes on the foraging mode of production. In (T. Ingold, D. Riches & J. Woodburn, eds.) *Hunters and Gatherers, vol. I, History, Evolution and Social Change*, pp. 269–285, Berg, New York.
- Kitanishi, K. 1994. The exchange of forest products (*Irvingia* nuts) between the Aka hunter-gatherers and the cultivators in northeastern Congo. *Tropics*, 4(1): 79–92.
- 1995. Seasonal changes in the subsistence activities and food intake of the Aka hunter-gatherers in northeastern Congo. *African Study Monographs*, 16(2): 73–118.
- Lee, R. B. 1968. What hunters do for a living, or how make out on scarce resource. In (R. B. Lee & I. Devore, eds.) *Man the Hunter: The First Intensive Survey of a Single, Crucial Stage of Human Development-Man's Once Universal Hunting Way of Life*, pp. 30–38, Aldine Publishing Company, Chicago.
- 1979. *The !Kung San: Men, Women, and Work in a Foraging Society*. Cambridge University Press, Cambridge.
- Osaki, M. 1984. The social influence of change in hunting technique among the Central Kalahari hunter-gatherers. *African Study Monographs. Supplementary Issue*, 12: 59–87.
- Takeuchi, K. 1994. Dietary avoidance among the Aka hunter-gatherers, Northeastern Congo (in Japanese). *Journal of African Studies*, 44: 1–28.
- 1995a. Ritual aspects and pleasure in hunting activity: Cooperation and distribution in the net-hunting activity of the Aka hunter-gatherers in northeastern Congo (in Japanese). *Journal of African Studies*, 46: 57–76.
- 1995b. Subsistence hunting in African tropical forest: Hunting techniques and activities among the Aka hunter-gatherers, northeastern Congo (in Japanese). *Zoo-archaeology*, 4: 27–52.
- Tanaka, J. 1980. *The San Hunter-Gatehrers of the Kalahari: A Study in Ecological Anthropology* (Translated by D. W. Hughes). University of Tokyo Press, Tokyo.
- 1991. Egalitarianism and the cash economy among the Central Kalahari San. *Senri Ethnological Studies*, 30: 117–134.
- Tanno, T. 1976. The Mbuti net-hunters in the Ituri Forest, Eastern Zaire: Their hunting activities and band composition. *Kyoto University African Studies*, 10: 101–135.
- Turnbull, C. 1965. *Wayward Servants: The Two Worlds of the African Pygmies*. Natural History Press, New York (Reprinted by Greenwood Press, Connecticut, 1976).
- Wiessner, P. 1982. Risk, reciprocity and social influences on !Kung San economics. In (E. Leacock & R.B. Lee, eds.) *Politics and History in Band Societies*, pp. 64–84, Cambridge University Press, Cambridge.
- Woodburn, J. 1968. An introduction to Hadza ecology. In (R. B. Lee & I. Devore, eds.) *Man the Hunter: The First Intensive Survey of a Single, Crucial Stage of Human Development-Man's Once Universal Hunting Way of Life*, pp. 49–55, Aldine Publishing Company, Chicago.

- 1982. Egalitarian societies. *Man (N.S.)*, 17: 431-451.
- 1988. African hunter-gatherer social organization: Is it best understood as a product of encapsulation? In (T. Ingold, D. Riches & J. Woodburn, eds.) *Hunters and Gatherers, vol. 1, History, Evolution and Social Change*, pp. 31-64, Berg, New York.

Appendix. Weight (kg) of the yield of meat and honey per day of each man.

	meat	meat from trapping	honey collected	honey owned	others' honey collected
M 1	0.02	0.00	0.172	0.139	0.025
M 2	0.00	0.00	0.287	0.027	0.085
M 3	0.00	0.00	0.117	0.000	0.117
M 4	0.24	0.24	0.999	0.246	0.374
M 5	0.00	0.00	0.405	0.338	0.000
M 6	0.06	0.00	0.663	0.290	0.283
M 7	0.00	0.00	—	—	—
M 8	1.24	0.00	1.757	1.267	0.359
M 9	0.04	0.00	1.316	0.280	0.117
M10	0.00	0.00	1.537	1.450	0.087
M11	2.22	2.15	—	—	—
M12	0.70	0.64	—	—	—
M13	0.24	0.00	1.044	0.859	0.093
M14	1.01	0.97	—	—	—
M15	0.31	0.00	—	—	—
M16	0.94	1.12	0.499	—	—
M17	3.46	1.66	0.508	1.079	0.074
M18	7.12	5.79	0.895	0.143	0.190
M19	1.39	1.10	—	—	—
M20	2.19	1.94	0.090	0.000	0.000
M21	3.63	3.15	0.202	0.279	0.000

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