THE SOCIAL INFLUENCE OF CHANGE IN HUNTING TECHNIQUE AMONG THE CENTRAL KALAHARI SAN

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ABSTRACT The Central Kalahari San are one of the few peoples remaining today who subsist by hunting and gathering. Under the guidance of the Botswana government, however, they have begun to live a sedentary life around the !Koi!kom borehole. Instead of traditional bows and arrows, they have adopted horses for hunting. Equestrian hunting (hunting on horse back) is more efficient and predictable than traditional bow-and-arrow hunting. The meat obtained by equestrian hunting is not shared with all member of the !Koi!kom settlement, because of the influence of trading, cash income, and the increase of the population around the !Koi!kom settlement.

INTRODUCTION

The San are among the few peoples remaining today who until recently subsisted solely by hunting and gathering. Although the majority of these people have abandoned the traditional hunting and gathering way of life, the Central Kalahari San⁽¹⁾ in the Central Kalahari Game Reserve still maintain their traditional lifestyle.

However, under the influence of the development policy of the Botswana government which started in 1979, their traditional lifestyle has profoundly changed. The San were a hunting and gathering people who lead a nomadic life throughout the year, moving with the seasons. A salient feature of this nomadism was the frequent change in the composition of the residential groups (Tanaka 1980:116). The sedentary lifestyle has replaced a nomadic one around the !Koi!kom borehole. Gathering, the most important subsistence activity in their traditional life, became reduced in importance. To make good the loss, the Remote Area Development Office dispatched an agricultural assistant to disseminate farming to the Central Kalahari San in the !Koi!kom settlement (Tanaka et al. 1984: 9). Instead of the traditional bow and arrow, the \neq Kade people began to use horses for hunting. On horse back, they chase and kill big game, such as gemsbok, eland, and wildebeest.

Apart from the symbiotic relationship between Pygmies and Bantu farmers, the influences of neighboring farmers and/or pastoralists on hunter-gatherers have often been ignored in the descriptions of modern hunter-gatherer societies (e.g. Tanaka 1980; Lee 1978). These conventional hunter-gatherer studies contributed much to the understanding of the hunting and gathering way of life which has been the most successful and persistent adaptation man has ever achieved. However, the flexibility of hunter-gatherer society cannot be explained by such studies. Even the San have lived for hundreds of years in contact with the societies that grow crops and keep domestic animals (Marks 1972). Furthermore, their present lifestyles show wide variation from pure hunting and gathering to a life heavily involved in agriculture and pastoralism, and in some cases an entire family or a group of families have shifted from foraging to farming and/or pastoralism (Vierich 1982: 216–9).

When their subsistence changed, from foragers to agriculturalists or pastoralists, what happens to their social system? While Hitchcock (1982) and Vierich (1982) pointed out that the majority of the San had been deriving their livelihood from agriculture and pastoralism



Fig. 1. Republic of Botswana.

and becoming sedentary, they focused their studies primarily on the ecological adaptations and paied little attention to the changes in the social system.

This paper addresses the question of how the introduction of horses to hunting has influenced the San's social system, by comparing their present-day life with their traditional life.⁽²⁾ Recent social changes among the San have mainly been caused by the development policy of the government. These are very recent changes which men had never experienced. I will argue that in the study of contemporary changes, though they do not follow exactly the same process, we will find a key to understanding such changes as "Neolithic Evolution", i.e. the origin of sedentism and the transition from hunting-gathering economy to that of the agricultural or pastoral.

THE PRESENT SITUATION OF THE CENTRAL KALAHARI SAN

1. Research Area

The \neq Kade area is located in the Central Kalahari Game Reserve situated in the central part of the Republic of Botswana (Fig. 1). According to Tanaka (1980: 25) who carried out research in this area from 1966 to 1974. there were 528 nomadic San subsisting by hunting and gathering.

Since the \neq Kade area is too arid for agriculturalists and pastralists to subsist, the San in the \neq Kade area were isolated from neighboring peoples and did not share the benefits of the government development program. Unlike the !Kung San of the Dobe area, the Central

Kalahari San obtained more than 90% of their water supply from plants, because surface water was available only for a total of 30–60 days during the rainy season in a year (Tanaka 1976: 100). In this area there was only one well, which was drilled by Silberbauer in 1962. Since the water must be pumped up from great depth by a diesel engine, this well was utilized only by the government officials (Tanaka 1980: 18).

The Remote Area Development Program, which was started in 1974 by the Botswana government to improve the living standard of the remote area residents, has rapidly changed the life of the \neq Kade people in many respects. One of the crucial factors of these changes was the continuous and ample supply of drinking water. In 1982, the construction of a school and medical clinic started. The guidance of the government has also facilitated the inflow of additional population of the Central Kalahari San from areas as far as 100 km, such as Gyom (Molapo). Metse-a-Manong and Manoatse, to allay their hunger and thirst during the dry season. As a result, traditional nomadic lifestyle in small groups changed to a sedentarized life in larger groups. At the time of the field research, more than 500 people lived around the !Koi !kom borehole (Tanaka et al. 1984: 13, 17).

2. Change of subsistence among the Central Kalahari San

Today, the \neq Kade people have more access to cash income. In 1982, the construction of a school and medical clinic started, and 7 San were employed as construction workers. Botswanacraft, buying agent of traditional handicrafts, was founded and came to this area to buy San's handicrafts two or three times a year (Tanaka et al. 1984: 10). With the cash from these sources, the \neq Kade people were able to buy maize meal for their daily diet.

The enforcement of governmental hunting regulations to this region contributed to the sedentary life around the !Koi!kom borehole, as it did for the Sandawe of Tanzania (Newman 1970: 59). The hunting regulation prohibited the use of guns and limited the kinds of animals that could be killed. The hunting licence system actually restricted not only their hunting activities but also their nomadic lifestyle.

Gathering became less important in their sedentary lifestyle. In the Kalahari, gathering has been most important when people led a nomadic life. According to Tanaka (1980: 61-2), in the traditional gathering strategy, the San in the \neq Kade area used in their food-gathering activity a range within 5 km in radius, centering around the campsite, and shifted their camp when they had consumed the food plants within the range. Gathering activity around the !Koi!kom borehole has been greatly reduced, because with a population of more than 500 people, wild food plants nearby were exhausted immediately.

If the \neq Kade people wish to depend on gathering wild food plants, they must utilize a much broader area than before. Lee (1969: 60-1) discussed the cost of distance for obtaining mongongo nuts (*Ricinodendron rautanenii*). He pointed out that if the distance from a camp to a collecting site is over 12 miles, which is the limit of a one-day trip. the costs increase sharply, because they must spend a night on the way. Even though the mongongo nuts have as much as 654 kcal per 100 g eaten, the cost of, a long distance trip for obtaining mongongo nuts is also high, because they must carry much drinking water and heavy loads over long distances. At present, the \neq Kade people keep about 70 donkeys, and it seems to be a good idea to use them on long distance gathering trips. During my investigation, however, such trips with donkeys were not made frequently. Bachelor boys and girls went to G/enohonam, 10 km away from the settlement, to collect kxom (*Grewia flava*), only three times.

In the Central Kalahari there are two kinds of nuts which were of great importance to the \neq Kade people until recently and have high caloric value like the mongongo nuts of the !Kung San: one is $n \neq an \neq$ te (*Bauhinia petersiana*) and the other is /oi (*Tylosema esculentum*). The /oi

grow in an open scrub plain over 40 km to the north of \neq Kade Pan, where there is no water, no firewood, and no suitable shady trees for resting. They sometimes make a trip of a few days with donkeys to collect /oi (Tanaka, 1976: 107; 1978: 179; 1980: 62). I did not observe such a long distance trip for gathering /oi. because my research was not conducted in the season for /oi which lasts only 3-4 months of the year. When its season comes, however. \neq Kade people said that they would make such long distance trip. Donkeys do not contribute much to their gathering activities. It is evident that the gathering is no longer important to their sedentary life in the !Koi!kom settlement.

Under the guidance of the government, the \neq Kade people began to have small gardens to grow maize, cow peas, sorghum, and cultivated tsama melon. Because of the drought beginning from 1981, the yields of the 1981, however, could not support them for more than 2-3 months. As a countermeasure against the drought, the government provided 12.5 kg of maize meal per person per month (including children) from July to November in 1982.

The ample supply of drinking water made it easy for \neq Kade people to keep domestic animals. When they were still nomadic hunter-gatherers, a group of several dozen people in the \neq Kade area kept some goats, donkeys, and even horses (Tanaka 1976: 100; 1980: 50). In 1983, as many as 20 horses, 70 donkeys, and more than 476 goats were kept in the !Koi!kom settlement. While 240 goats were owned by one wealthy man, all the others had only one or two goats. During my stay, \neq Kade people frequently milked the goats, but slaughtered only 6 goats, besides the one that died naturally. Although the goats were regarded as potential food stocks for their subsistence, they contributed little to the diets of the \neq Kade people during the investigation period. Donkeys were not eaten but used as pack animals to transport meat, wild food plants and water from the borehole to their huts.

3. \neq Kade People and Horses

Horses have not been entirely unknown to the \neq Kade people. Tanaka (1978: 34) noted: "in the process of Bantu migration, the Kgalagadi invaded the Kalahari desert, which is the territory of the San, and they have hunted on horse back. They sometimes lived with the San, and some of them were married to San women. Equestrian hunting, spear hunting on horse back, had been introduced to the San by people who were mixed with the Kgalagadi".

At the time of my investigation, 20 horses were kept by 18 people, 16 of whom became horse owners after the installment of the !Koi!kom borehole. The drastic change in hunting methods in the last several years can not be solely regarded as the result of pursuing a more efficient hunting method. First, this change was made possible by securing ample water for horses from the borehole. Since no permanent waterhole existed in this part of the Kalahari, as already mentioned, it cost dearly to collect wild tsama melon to provide the horse with sufficient water. Second the development program enabled the \neq Kade people to get cash income by selling traditional handicrafts, meat to the construction workers, or by employing them as wage laborer. These factors seem to be responsible for the increase in the number of horses owned by the \neq Kade people.

EQUESTRIAN HUNTING

1. Hunting Method

During my 5 month stay in the !Koi!kom settlement, 91 large animals were killed by equestrian hunting, while only three large animals were killed by bow-and-arrow or by spear hunting with dogs (Table 1). In the !Koi!kom settlement, the hunters can not get along with-

Methods	No. of kills							Estimate of
	Gemsbok	Eland	Wildebeest	Kudu	Hartebeest	Large artiodactyl	Total	total weight* (kg)
Horse and spear	50	29	4	1		3	87	22,800
Bow and arrow	1	—		1	1		3	700
Spear and dogs	—	_	1	—	_	_	1	200
Total	51	29	5	2	1	3	91	23,700

Table 1. Total number of animals killed by hunters from Sep. '82 to Jan. '83.

*Tanaka (1980: 68, Table 11)

out horses. Equestrian hunting (spear hunting on horse back) can be divided into the following two methods: (1) one-day hunting and (2) group expedition hunting.

In one-day hunting, individual hunters leave the !Koi!kom settlement in the morning and return in the evening. One-day hunting is performed whenever each hunter wants to do so, without prior arrangement. Once a hunter decides to go out for a one-day hunting, the first thing he does is to catch a horse in the morning. Unless there are lions near the settlement, horses are pastured around the settlement. After watering the horse, the hunter leaves the settlement alone with a spear and a knife.

The first step is to search for the footprints of animals from which a hunter identifies the species and sex, as well as the time passed after the footprints were made. If the footprints are new enough, he starts to follow them. According to my informants in the \neq Kade area, it takes two to three hours to locate the target after the start of the pursuit. Once the hunter locates the target, he begins to chase it into the direction of the settlement as much as possible. When the target comes close enough to the settlement as much as possible, he kills the animal. In case of a gemsbok, the hunter throws his spear to kill. In the case of larger game such as elands, he stabs his spear repeatedly while on horse back. When the animal is killed, it is covered with grasses and branches to protect it from hyenas and vultures. On returning to the settlement, the hunter announces where he has killed the animal and asks someone to go and carry it back with donkeys.

The second hunting method is group expedition hunting. Typical expeditions consist of 6 to 7 persons: one or two hunters with horses, and 4 or 5 cooperators with donkeys which are used for transportation. One expedition usually takes about one week. During the expedition, hunters set up a hunting camp in a place where water is available. The hunting camp is usually 40 to 50 km away from the settlement. The hunting methods used in the group expedition hunting are identical to that of one-day hunting except for the following two points: (1) group expedition hunting is performed after a prior arrangement. (2) the cooperators dry and preserve the meat to carry it to the settlement. After they butcher the animals into 7 pieces or so at the killing site, they carry the meat back to the hunting camp on donkey back, and then cut the meat into strips and dry them to make biltongs. They take back bundles of biltong⁽³⁾ to the settlement. Table 2 shows the number of bundles made from each animal species.

Animals	Number	of bundles	
	male	female	
Gemsbok	4	3	
Kudu	6	5	
Eland	10	8	
Large artiodactyl	18	16	

Table 2. Number of bundles of biltong made from each animal.

2. Hunting success

During the 5 month investigation period, the amount of meat obtained by the equestrian hunting was estimated at 22,800 kg, of which 88% (20,000 kg) was obtained by group expedition hunting. In contrast, the amount of meat obtained by bow-and-arrow hunting and spear hunting with dogs was only 900 kg (Table 2).

Tanaka (1980: 68, Table 11) estimated the annual amount of meat obtained by bow-andarrow hunting in the same region at 5,605 kg for a camp of 50 people. In order to compare bow-and-arrow hunting with equestrian hunting, we estimated the annual catch for 50 people, including the amount of meat obtained by bow-and-arrow and spear hunting, at 5,688 kg (22,800 kg $\times 12/5 \times 50/500 = 5,688$ kg/50 persons year). The amount of meat obtained by equestrian hunting is similar to that by traditional bow-and-arrow hunting.

Concerning the cases for which I have full data, the number of days each hunter went hunting, the number of game animals killed, and the estimated amount of meat obtained are shown in Table 3. According to this, a total of 20,000 kg of meat were obtained in a total

Name of	No. of		Estimate				
hunter	hunting days total	Gemsbok	Eland	Wildebeest	Large artiodactyl	Total	of total weight* (kg)
Gyube	30	10	5	1	1	17	4,700
Hara	20	4	3	1	1	9	2,900
Kene/nu	19	6	2	1	_	9	2,000
Murisa	19	2	3	—	_	5	1.300
Maho	18	5	2	<u> </u>	1	8	2,600
Takwe	15	1	1	1	_	3	700
Oshuman	11	4	1	_	_	5	1,100
Shoko	11	1	2	_	_	3	800
Shieho	11	1	1		_	2	500
/Aoshi	9	2	5		_	7	1,900
N/oshie	9	2	2	_	_	4	1,000
Gyube	3	<u> </u>	1	_	_	1	300
Pirishi	3	1	—	<u> </u>	_	1	200
Total	178	39	28	4	3	74	20,000

Table 3. Group expedition hunting: Numbers of animals killed by each hunter from Sep. '82 to Jan. '83.

*Tanaka (1980: 68, Table 11)



Fig. 2. Relationship between number of hunting days and number of kills.

of 178 hunting days, with the average being 112 kg per day. This may even be an underestimate, we can understand how efficient the equestrian hunting is.

The traditional bow-and-arrow hunting is an unstable endeavor which needs large amounts of labor input with great unpredictability as to whether a good sized animal can be obtained (Tanaka 1980: 72). It means that even an excellent hunter kills a large animal only by chance, though it is true that his hunting success depends on his ability. In other words, there is no correlation between number of hunting days and the number of kills in hunting. The corelation between the number of hunting days for each hunter and the number of kills is quite high (r = 0.88, t = 6.08. p < 0.001). The regression line is expressed in the formula:

Y = -1.4304 + 0.5202X (Fig. 2)

where X represents number of hunting days and Y represents number of kills. According to this regression line, it takes only two days to kill one large animal. Therefore, we can conclude



Fig. 3. Map of the hunting area. This map was modified from Tanaka (1976: 99, Map 4.1). The area surrounded by a solid line is the hunting area used by equestrian hunting. The area surrounded by a dotted line is the home range when the Central Kalahari San were traditional hunter-gatherers (Tanaka, 1980: 17, Figure 5).

that the equestrian hunting method is quite efficient. It takes about three days for the first kill to be made. Since it takes at least two or three days in going and returning and the hunters seldom killed animals on their way to and from the camp, this regression line reflects well the real hunting activities.

3. Hunting Area

The hunting area presently used for equestrian hunting is estimated to be about 5,000 km² based on the location of the killing site (Fig. 3). Tanaka (1980: 81) estimated the home range of about 200 permanent residents in the \neq Kade area as 4,000 km². The present !Koi!kom settlement is located in the center of the \neq Kade area. The hunting area of the settlement includes all of the home ranges of the permanent residents in the \neq Kade area and an expanded area to the north. A resident of the settlement explained to me that the !Ka in the north was a good place for equestrian hunting, because of the scarcity of bushes and the existence of watering places.

One of the factors causing the expansion of the hunting range is the population increase. It has created far more demands for meat and encouraged the hunting, which has finally eliminated the game near the settlement. As a consequence, hunters have to go to more distant places for hunt. Long distance expedition hunting is made possible by the use of donkeys as a carrier. Hitchcock (1978: 263) stated that expedition hunting with spears and dogs characterized the part-time hunter-gatherers far more than full-time hunter-gatherers among the San in Western Sandveld, Central District of Botswana. The Boyele, slash-and-burn agriculturalists of the central Zaire Forest, adopt a temporary nomadic lifestyle on their occasional hunting trip away from the village to the area rich in game resources (Sato 1983: 50). Expedition hunting can also be regarded as a characteristic of the hunters who lead sedentary lives.

Lee (1979: 223; 1980: 33) pointed out how difficult it was for a human to carry meat on his back. Without donkeys which can carry more than 50 kg of meat even during the night, it would be impossible for \neq Kade hunters to go hunting in such a remote area and bring back the meat to the settlement.

DISTRIBUTION OF MEAT

The changes in the hunting methods discussed above have also influenced the pattern of meat distribution. It is not rare that three or four large animals are obtained by one expedition hunting group, which never happened in the traditional hunting with bows and arrows. In principle, the animals killed by equestrian hunting belong to the horse owners. Thus, a small number of horse owners would obtain a great deal of meat. To the hunters who have no horse, the meat is distributed according to their contribution to the hunt. Those who do not participate in the hunting have a chance to eat together with those who have meat.

The following are examples of meat distribution in the case of one-day hunting:

Case 1

5 Jan. 1983. /Aoshi went one-day hunting with a horse borrowed from Zirakwe. Hekilled a gemsbok near the settlement (App. I). After dismembering the animal, hecarried the meat back on horse back. The distribution of the meat was as follows:ParticipantsParts obtained/Aoshi (hunter):one fore leg

Non-participants	
Zirakwe (owner):	one fore and hind leg, torso, fat
Ayakxoi:	one hind leg
Gono:	head and neck
Avakxoi's wife's daugh	ter was married to Zirakwe. Gono was not related to anyone.

Case 2

I Jan. 1983. Murisa went one-day hunting on his own horse. He killed an eland in /Ehao (App. I). He returned to the settlement once. Maho, Jackarashi, and !Koakua as well as himself carried the animal back with their three donkeys. The distribution of the meat was as follows:

Participants	Parts obtained
Murisa (hunter and owner):	torso, one hind leg, fat
Maho:	one fore leg
Jackarashi:	one hind leg
!Koakwa:	head, neck
Non-participant	
!Aukwa:	one fore leg

!Aukwa was Murusa's brother. Maho, Jackarashi, and !Kaokwa were not related to Murisa.

In hunter-gatherer societies, the distribution of meat is performed in two stages. The first distribution is done among the participants of the hunt, and the second distribution at a second stage is the re-distribution from the participants to the non-participants (Harako 1976: 76–8: Tanaka 1980: 95–6). According to Cases 1 and 2, the first distribution following one-day hunt is summerized as follows:

owner: torso, one leg, fat hunter: one leg

cooperator: one leg

The owner of the horse obtained almost half of the meat, while the hunter, if he borrowed a horse, obtained only one fore or hind leg.

From 22 to 29 Jan. 1983, Maho Gyube and others went on a group expedition hunt. The meat distribution after group expedition hunting are as follows:

Case 3

As Maho's own horse had a sprained its ankle, he borrowed Takwe's horse. He killed 6 animals. N!oaaya. Daon \neq u, and Takwe were engaged in dismembering the animals and transporting the meat to a hunting camp. 32 bundles of biltong were made from these animals. The distribution of meat were as shown in Fig. 3. Daon \neq u's divorced wife is a daughter of !Noaaya. Daon/ua was a son of N!oaaya. Juanes was a brother of Maho's wife. Since Maho's wife had gone to Ghantsi by herself, Juanes brought up Maho's son. Habonbane received one bundle of biltong as a payment for 3 cultivated tsama melon. N \neq ebedi was not related to anyone.

Case 4

Gyube owned a horse with his brother, Tsomako. He killed 8 large animals. /Et!ebe, Kosa, and Hxarese dismembered and transported these animals to a hunting camp and made biltong there. Each cooperator received one bundle of biltong, and Gyube shared the remaining meat with Tsomako.



Fig. 4. Distribution of meat for case 3. Upper number in the circle represents the number of bundles received. Lower number in the circle represents the number of bundles remaining after the distribution.

There was a great difference in the cooperators between Cases 3 and 4. In Case 3, three cooperators obtained more than half the meat. In contrast, in Case 4 each of the three cooperators received only one bundle of biltong, while according to Table 2, the owner and hunter obtained 42–52 bundles of biltong. Why did such a difference occur?

Since Takwe, the owner in Case 3, had grown up in Ghantsi, he had no relatives in this settlement nor knowledge about how to live in the bush. On 13 December 1982, he went on a one-day hunt by himself. On the way back to the settlement, he lost his way and took 4 days to return. Such a thing was unthinkable for \neq Kade hunters. I guess that since \neq Kade people never regarded him as an established San, even though he owned the horse, he had less influence on the meat distribution than the other horse owners in the settlement.

In consideration of this factor, it is concluded that the meat distribution pattern following expedition hunting is as follows:

Owner:	approximately half the meat
Hunter and cooperators:	share the remaining meat

Thus, a great deal of meat is concentrated to the owner of the horses in the first distribution stage.

In contrast traditional bow-and-arrow hunting, the people who receive meat in the second stage re-distribution is limited to close relatives and intimate friends. Even after the re-distribution, usually there is a considerable difference in the amount of meat between individual families in the settlement.

It was not, however, acceptable to the \neq Kade people that the owner of the horse not share meat. Whenever meat was brought back into the owner's hut. \neq Kade people gathered around the owner's hut, and pressed him to share his meat saying: "You have too much meat for your family, but you never share your meat with us. You want a great deal of meat to rot, don't you." On the contrary, in the hunting camp during group expedition hunting there was no distinction between haves and have-nots. They shared meat as before. Since \neq Kade hunter did not carry food for hunting, in their hunting camp they ate meat to their hearts content every day. From 21 to 28 December, Gyube and others went group expedition hunting. II). In their hunting camp, they consumed 40% of the meat obtained by hunting.

DISCUSSION

In contrast to traditional life, the meat is not distributed to all members of the sedentary camp in the !Koi!kom settlement. The question arises as to why the \neq Kade people no longer share the meat? The following three factors are responsible for the situation in the !Koi!kom settlement.

First, the meat obtained by equestrian hunting has a different meaning to the \neq Kade people from that obtained by bow-and-arrow hunting. Any \neq Kade hunter could make bows and arrows, while horses were not easily obtainable. The \neq Kade people usually bought a horse at farms of white settlers in Ghantsi, or from the Kgalagadi in Gyom (Molapo). It cost about P.100 (\$110) in Ghantsi. Among the \neq Kade people a horse was once purchased with P.40 (\$44) and 7 subadult goats. Even though they got cash income from Botswanacraft and by selling meat to construction workers, it is difficult for the people whose life is characterized by "an immediate return system" (Woodburn, 1982: 432), to save enough money to buy a horse. Therefore, it is reasonable for the owner of horses not to share the meat obtained by equestrian hunting, because he could not expect reciprocation from those who have no horse.

Second, the increase in the population of the !Koi!kom settlement made it difficult to distribute meat to all residents. Even though equestrian hunting is an excellent hunting method, hunters can not obtain enough meat to satisfy 500 people at a time.

Similar situations occurred even when they lived as traditional hunter-gatherers. When the amount of meat obtained by hunting was not enough to satisfy the whole camp, the range of sharing was limited to a smaller group. Tanaka (1980: 96) stated "Small game, such as duikers, steenboks, foxes and jackals. will not be divided up for the whole camp; such a game usually goes only to people close to the hunter. Smaller game, such as birds, tortoises, hares, and springhares, and gathered plant foods are usually consumed within a family, but may be shared with visitors and friends." Since the norm of their society was egalitarianism, the meat which was not shared may have been negligible. At present, however, \neq Kade people limit the range of sharing, and seldom share with visitors from other camps.

Third, since \neq Kade people now sell meat⁽⁴⁾, the amount of meat which they themselves consume decreases, though the amount of meat obtained by hunting is at a similar level as before. Many workers came from Ghantsi to construct a school and health clinic and vehicular traffic has become frequent. They bought meat for themselves or to sell in Ghantsi. Meat trading has constricted the practice of sharing among the \neq Kade San.

Similar effects of trading have been reported from areas outside Africa. In Southeast Asian hinterland communities, as the Iban and Land Dayak, the intensity of sharing within the village or tribe is low, the engagement with the market required the accumulation of rice, limiting the amount that could be shared (Sahlins, 1974; 224). As Lee notes there are important contradictions between sharing and accumulation (1979: 412–3). However, without accumulation of surplus meat, the trading cannot be organized.

Cashdan (1980: 117) stated that the relationship between egalitarianism and the lack of economic buffers among the !Kung San appears to be typical of most San group. Cashdan, who studied the G//ana in Molapo, noted that "inequality among the G//ana can therefore be explained best not as the development of any formal organization of 'ranking' or 'stratification', but, rather, as the inevitable result of the lifting of the constraints that produce strict egalitarianism among other Kalahari hunter-gatherers. These constraints arise from a lack of means to buffer environmental variability, and are form of social insurance for hunter-gatherers living in unpredictable environments (1980: 119–20)". Since hunting is an unstable endeavor involving large amounts of labor input, meat sharing actually plays an important

role as an insurance against hunger. However, the ratio of vegetable food to animal food in the diet of the Central Kalahari San is 5.6:1 in terms of calories (Tanaka 1980: 74), which means that they can survive in the Kalahari without meat (Tanaka 1978: 113). The amount of meat shared contributed little to economic buffering.

Furthermore. Molapo (Gyom in Tanaka), were Cashdan carried out research, was not a home base of the G//ana (Cashdan 1980: 116) but a mixed village consisting of the Kgalagadi, Bantu, and the San (Tanaka 1980: 16, Fig. 4). Then, the Molapo people traded with the people outside the Reserve (Cashdan 1980: 117). Thus, the shrinkage of generalized reciprocity in Molapo may not be due to the introduction of other economic buffers (livestock and farm food) but to the introduction of meat trading.

Egalitarianism is probably not related to economic buffering. The number of species of plants regarded as food by the Central Kalahari San totals more than 80. In any given period, a couple of dozen of these plants may be ready to be collected, but the San actually utilize only a few favorite plants at any single time (Tanaka 1980: 58; 1976: 105). In a sense, hunter-gatherer societies do have a more efficient buffer against the fluctuation of the food supply than other societies. Lee (1968: 39–40) noted that during the most severe drought in South Africa's history, the Herero and Tswana women were able to feed their families only by joining the Bushman women and forage for wild foods. Thus the natural plant resources of the Dobe area were carrying a larger population than would be the case in the years when the Bantu harvested crops. Woodburn (1968: 54) also noted a similar situation for the Hadza of Tanzania. I do not know whether or not such a situation took place in the Central Kalahari San are similar to those of the !Kung San. I presume that the Central Kalahari San also have ample food resources.

Although there is a considerable difference in subsistence between haves and have-nots, it does not cause the difference in status between haves and have-nots. A wealthy person is not respected, rather envied as was the case in the traditional life. The District Commissioner of Ghantsi recently appointed a headman and three councils, but most of the \neq Kade people do not regard them as their delegates or rules. \neq Kade people have not wholly accepted the inequality of meat distribution. As already mentioned, whenever meat was bought back into the owner's hut, people visited the owner and pressed him to share, although they knew the owner would not share. In the !Koi!kom settlement, egalitarianism is still a powerful ideal that cannot be ignored.

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Research was carried out for 6 months, from August 1982 to February 1983, in \neq Kade area in Republic of Botswana.

NOTES

- (1) Following Tanaka (1980: 11), I will use the the name "Central Kalahari San" to refer to both the G/wi and the G//ana.
- (2) I will use "traditional" or "before" to refer to the condition in which the Central Kalahari San lived as fulltime hunter-gatherers (see, Tanaka, 1980).
- (3) Weight of one bundle of biltong was 10-15 kg.
- (4) I estimated the \neq Kade San sold one fourth of meat obtained by hunting.

REFERENCES

Cashdan, E., 1980. Egalitarianism among hunters and gatherers. American Anthropologist, 82: 116-120.

- Guenther, M. G., 1976. From hunters to squatters: Social and cultural change among farm San of Ghanzi, Botswana. In (R. B. Lee and I. DeVore, eds.) Kalahari Hunter-Gatherers, pp. 120–134. Harvard University Press, Massachusetts.
- Harako, R., 1976. The Mbuti as hunters: A study of ecological anthropology of Mbuti pygmies (1). *Kyoto University African Studies*, 10: 37-99.
- Hitchcock, R. K., 1976. Kalahari Cattle Post: A regional study of hunter-gatherers, pastoralists, and agriculturalists in Western Sandveld region, Central District, Botswana, Government Printer, Gaborone.

------, 1982. Patterns of sedentism among the Basarwa of eastern Kalahari. In (E. Leacock and R. B. Lee, eds.) *Politics and History in Band Societies*, pp. 223–267, Cambridge University Press, London.

Lee, R. B., 1968. What hunters do for a living, or how to make out on scare resources. In (R. B. Lee and I. DeVore, eds.) *Man the Hunter*, pp. 30-48, Ardine, Chicago.

, 1969. !Kung Bushmen subsistence: An input-output analysis. In (A. D. Vayda, ed.) Environment and Cultural Behavior, pp. 47-79, University of Texas Press, Austin.

------. 1979. !Kung San: Men, Women, and Works in a Foraging Society, Cambridge University Press, London.

- Lee, R. B. and I. DeVore, 1968. The problem in the Study of Hunters and Gatherers. In (R. B. Lee and I. DeVore, eds.) *Man the Hunter*, pp. 3-12, Ardine, Chicago.
- Marks, S., 1972. Khoisan resistance to the Dutch in seventeenth and eighteenth centuries. *Journal of African History*, 13(1): 55-80. (Cited from Vierich 1982).
- Newman, J. L., 1970. The Ecological Basis of Subsistence Change among the Sandawe of Tanzania, National Academy of Science, Washington, D.C.
- Sahlins, M., 1974. Stone Age Economics, Tavistock Publications. Bristol.
- Sato, H., 1983. Hunting of the Boyele, slash-and-burn agriculturalists, in the central Zaire Forest, African Study Monographs, 4: 1-54.
- Tanaka, J., 1976. Subsistence ecology of the Central Kalahari San. In (R. B. Lee and I. DeVore, eds.) Kalahari Hunter Gatherers, pp. 98-119, Harvard University Press, Massachusetts.

-, 1978. Hunters in the Desert (In Japanese), Chuokoronsha, Tokyo.

—, 1980. The San: Hunter-Gatherers of the Kalahari. University of Tokyo Press, Tokyo.

- Tanaka, J., K. Sugawara, and M. Osaki, 1984. Report of the San (Basarwa) Investigation Carried out During 1982-3.
- Vierich, I. D., 1982. Adaptive flexibility in a multi-ethnic setting: The Basarwa of the southern Kalahari. In (E. Leacock and R. B. Lee, eds.) Politics and History in Band Societies, pp. 213-222, Cambridge University Press, London.
- Woodburn, J., 1968. An Introduction to Hadza Ecology. In (R. B. Lee and I. DeVore, eds.) Man the Hunter. pp. 49-55, Ardine, Chicago.

------, 1982. Egalitarian societies. Man (N.S.), 17: 431-451.

Appendix I.	One-day	hunting activi	ty in !K	oi!kom settle	ment from Se	p. '82 to Jan. '83

		-			•	-
No.	Date		Name of hunter	Kills	Kill site	
1	Oct.	11	Gyube	1 GE	?	_
2		14	Gyube	I GE	?	
3	Dec.	28	Maho	1 WI	≠Gareka	
4	Jan.	2	Gyube	1 GE	≠Zerohonam	
5		3	Shieho	1 GE	≠Gareka	
6		4	Kene/nu	I KU	?	
7		5	Murisa	1 EL	/Ehao	
8		5	Takwe	I GE	/Zerohonam	
9		8	/Aoshi	I GE	?	
10		8	Murisa	I GE	?	
11		16	Murisa	2 GE	?	
12		18	Shieho	I GE	≠Gareka	

GE: gemsbok; WI: wildebeest; EL: eland; KU: kudu.

Appendix II. Group expedition hunting activity in !Koi!kom settlement from Sep. '82 to Jan. '83.

No.	Date	Name of the hunter	Kills	No. of cooperators	Location of base camp
1	Sep. 1-3	Oshuman	2 GE	3	?
2	Sep. 10-12	Gyube	1 GE	4	?
3	Oct. 1-7	Murisa	_	1	?
4	Oct. 2-6	Kene/nu	4 GE	?	?
		Hara	1 GE, 1 WI, 1 LA		
		Takwe	1 GE, 2 KU		
5	Oct. 4-11	Oshuman	2 GE, 1 EL	4	?
6	Oct. 10-14	Kene/nu	2 EL	12	?
7	Oct. 11-13	Hara	2 GE	2	?
		Shieho	<u> </u>		
8	Oct. 11–13	Murisa	_	2	?
9	Oct. 21–23	Gyube	1 WI	5	? _
10	Dec. 6–15	Maho	3 GE, 2 EL	7	Kia/mo, Tu,
		Takwe	1 EL	_	/Gau/o. !Ka
11	Dec. 11–12	Hara	1 GE, 2 EL	5	?
12	Dec. $11 - 15$	Gyube	2 GE, 2 EL	7	Kxaochu
		Shieho	1 EL		
		Shoko	1 EL		
		Gyûbe	1 EL	-	-
13	Dec. 21–28	Gyube	1 GE, 2 EL	?	?
		Shieho	I GE		
		Hara	I EL	0	•
14	Jan. 11–13	Gyube	3 GE	?	?
		Shieho	-		
15	Jan. 19–27	Kene/nu	2 GE	?	/Enao, !Ka
		/Aoshi	2 GE, 5 EL		
		Murisa	2 GE, 3 EL		
		N/oshie	2 GE, 2 EL		
16	Jan. 22–29	Gyube	6 GE, I EL, I LA	11	≠owa/na
		Maho	2 GE, I EL, I LA		
		Shoko	IGE, IEL		,

GE: gemsbok; EL: eland; LA: large artiodactyl.