From Hunters to Herders: Subsistence Change as a Reproductive Strategy among the Mukogodo


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The demography of sociocultural change has become an important topic for anthropologists and other social scientists, yet seldom have the reproductive interests and strategies of individuals been considered as possible sources of change. Such interests and strategies are crucial to an understanding of an episode of rapid and radical change among the Mukogodo of north-central Kenya. I shall argue that their transformation from hunters to herders within a few decades early in this century was a response to the need to obtain livestock in order to marry.

THE TRANSITION TO PASTORALISM

The Mukogodo live in and around a range of forested hills just north of Mt. Kenya, in the eastern part of Mukogodo Division, Laikipia District. For many centuries before 1900, they lived in caves, subsisting on a variety of wild animals, plants, and honey from both wild and man-made hives. Their population is unlikely to have been much more than 200 during the cave period. They called themselves Yaaku, a word originally meaning “hunters” that was borrowed from a Southern Nilotic language sometime around the end of the 1st millennium A.D. (Ehret 1971:51–52). The origins of the name “Mukogodo” are obscure, but nowadays it is usu-
ally used instead of Yaaku. The Mukogodo originally spoke a language that has been identified as Eastern Cushitic (Greenberg 1963; Ehret 1971, 1974; Heine 1974). They circumcised their sons and from at least the middle of the 19th century shared the Maasai and Samburu age-set system. They were divided into 4 clans and 13 patrilinages, each lineage having its own territory for hunting, trapping, gathering, and the placement of bee hives. Postmarital residence was, as it is today, usually virilocal. Mukogodo married mostly among themselves, and a few beehives made from hollowed logs were the usual form of bridewealth.

After 1900, the Mukogodo began to acquire and keep cattle, sheep, and goats. Because the caves were inconvenient for cattle keeping and distant from good pasture, they also began to build houses. This subsistence change coincided with a more general cultural shift to Maasai ways and, most remarkable, the virtual abandonment of their language in favor of Maa, the language of the Maasai and Samburu. Cattle rather than beehives became the usual form of bridewealth. It is possible that they began to practice female circumcision during this period, although the evidence on this is unclear. D. G. Worthy, a colonial administrator in Mukogodo during the late 1950s, reported that female circumcision was a new practice there (1959:1.2), but my informants believed that it had always been done. Today Mukogodo speak only Maa and live, dress, and act very much like Maasai. Beekeeping is still practiced and wild honey is still gathered, although honey’s importance to the diet is very much diminished. Hunting is nearly unknown, and wild plant foods are eaten only occasionally. Most subsistence is obtained from livestock, with some help from remittances sent by men with jobs elsewhere in Kenya.

Judging from both colonial government records and the reports of Mukogodo informants, the main period of change appears to have been between 1925 and 1936. One European settler testified in 1932 before the Kenya Land Commission that when he had first met the Mukogodo in 1915 they had been purely foragers and beekeepers but that since 1920 they had obtained some livestock (Kenya Land Commission 1934:1464, 1476). According to Worthy (1959:2.1), “It is clear that until at least 1925 the Mukogodo Dorobo owned no stock whatsoever.” In 1932, a group of settlers described the Mukogodo as being “stock owners in a very small way, the remainder being bush and cave men pure and simple” (Kenya Land Commission 1934:1471), indicating that by the early 1930s the transition had begun but was not yet complete. This is corroborated by Mukogodo who experienced the transition. Individuals who had been about 10 years old at the time of the move from the caves were about 65 in 1986, meaning that they had left their caves in about 1931; slightly younger individuals had no memories of cave life, suggesting that the transition was complete for most Mukogodo by about 1936. The move from the caves is an important indication of subsistence change. Although the Mukogodo say that they liked living in caves, they abandoned them when they acquired cattle.

Several other Maa-speaking groups are neighbors of the Mukogodo (fig. 1) and have been important in their history: Samburu, Mumonoyot, Ilng’wesi, Digirri, and LeUaso or Lograla. Except for the Samburu, all of these groups engaged in some hunting, but by the early part of this century it was no longer their full-time occupation and many had acquired large herds. The Mumonoyot, in fact, did not know how to make their own hunting tools (bows, arrows, and poisons) and had to trade for them with the Mukogodo. Also unlike the Mukogodo, none of these groups were beekeepers.

Samburu, Mumonoyot, Ilng’wesi, and Digirri had been moving in and around the Mukogodo area for many decades, but the British presence, beginning mainly in the
early 1900s and intensifying in the 1920s and 1930s, greatly influenced their movements. British influence took the form of expulsion from lands alienated for white settlement and deliberate resettlement to adjust and control the Kenyan ethnic landscape. The highlands around Mt. Kenya were particularly attractive to whites, and alienation of farmland for their use forced both Ilng’wesi and Digiriri north into the Mukogodo area [Kenya Land Commission 1934:1571; Worthy 1959:3.1, 4.1]. Further alienation of rangeland on the southern and western edges of the area increased the pressure on these groups and on the Mumonoyot, bringing them into more frequent contact with one another and with the Mukogodo and thus making it easier and more likely for them to intermarry. Deliberate population movements began in 1912–13 when Maasai, including Mumonoyot, were deported to a reserve in southern Kenya and Samburu were deported northward. Mumonoyot were deported again in 1925–26, 1929, 1935–36, 1939, 1940, and 1946 and Samburu in 1927, 1935, 1940, 1955, 1958, and 1959 [Worthy 1959:16.1; Spencer 1973:210]. Ilng’wesi were deported to Meru in 1925 [Kenya Land Commission 1934:1571; Worthy 1959:4.1].

Most of those deported eventually moved back to the Mukogodo area. For example, in 1925 the government reduced the Mumonoyot population of the area to 5, but by 1931 it was 395 [Worthy 1959:6.1]. By the time the Ilng’wesi were authorized to return to Mukogodo in 1935, many had already done so [Worthy 1959:4.1]. These forced movements gave Samburu, Mumonoyot, and Ilng’wesi an incentive to marry Mukogodo, such that the ties bolstered their claims to residence in the Mukogodo area and made it easier for them to reestablish themselves and their herds when they returned. When Mukogodo intermarried with these groups, they received livestock rather than beehives as bridewealth. Informants often volunteered that many men first obtained livestock by marrying their daughters to non-Mukogodo men, and Worthy [1959:2.1] reports that the Mukogodo acquired “cattle largely as bride prices for their daughters ... married off ... to these immigrant Masai [Mumonoyot].”

It might be argued that, in addition to bringing groups into proximity and thus fostering intermarriage and a change in bridewealth, the British presence encouraged the shift to pastoralism through effective suppression of hunting and livestock raiding. This does not, however, seem to have been the case. With the exception of occasional visits to remove Samburu, Mumonoyot, and Ilng’wesi, the British left the Mukogodo area largely unadministered until the 1940s or 1950s.

Although a few Mukogodo were arrested in 1932 for killing rhinoceros, trading rhino horns, and possessing rhino meat [Kenya Land Commission 1934:1504], there was no constant government presence in the Mukogodo area until 1948, when a district officer was first stationed at Don Dol [District Commissioner 1955?]. A police post was not established until 1951 [Worthy 1959:16.2]. Before that time, the area was “an unadministered paradise” [Spencer 1973:210]. According to evidence submitted by a group of European settlers to the Kenya Land Commission in 1932, the Mukogodo area was “very rarely visited by police and never by administration” [Kenya Land Commission 1934:1470, 1471]. In 1936, a colonial official who requested that additional police be posted in Mukogodo was told that the government could not afford to do so [Hodge and Vidal 1936]. In 1938, another official complained that the system of tribal police was not working because the police did not do their jobs [Morgan 1938]. One old Mukogodo man remembers that the British did not usually punish game-law offenders, especially if the hunter was old.

Even if they had enforced the game laws, the British would have focused on large, conspicuous species, particularly elephants and rhinoceros, whereas the Mukogodo depended on relatively minor and plentiful species such as hyrax, buffalo, giraffe, and antelope. Elephant was taboo as food for most Mukogodo, and, although they would eat rhinoceros, most disliked the smell of it.

Because Mukogodo recall their past as a time in which they were plagued by enemies and raids by and on other tribes are the 19th-century events best remembered, it is conceivable that the colonial situation contributed to a shift to pastoralism by putting an end to the raiding that constituted one of its major risks. Given the lack of a consistent police presence in the area, however, raiding was probably no more effectively prohibited than hunting. Further, some observers have considered attacks on foraging groups rare in comparison with the situation in precolonial East Africa in general. The explorer Joseph Thomson (1885:447) wrote that foragers “enjoy considerable immunity from attack by the Masai, as they are sources of wealth to the latter by attracting the coast traders; usually, too, the Masai fall heir to a considerable share of the ivory.” Again, what little evidence there is on livestock raiding in the area involves only raids by Mukogodo on other groups. The earliest evidence dates from 1932, when three Mukogodo were convicted and two more were accused of sheep theft. One of the convicts was a repeat offender, indicating that there may have been some arrests for stock theft before 1932. All of the thefts were of European and Somali stock. In 1938, an administrator on a safari through the Mukogodo area reported that they were continuing to investigate a case of cattle theft from Meru in 1934 in which two Mukogodo men were the chief suspects [Morgan 1938].

THE ROLE OF REPRODUCTIVE STRATEGIES

Rapid changes in behaviors and social patterns such as the Mukogodo transition to pastoralism are possible because of humans’ intelligence, behavioral plasticity, and capacity for cultural learning, and if these characteristics are in fact the products of natural selection then, along with other evolved human traits, they ought to lead to behavior that would have promoted reproduction in the environments of human evolution [Irons 1979]. Although people need not consciously desire to reproduce
for evolutionary biological theory to be relevant to the study of their behavior, it happens that Mukogodo men generally report that they desire more wives and children than they now have and make plans and act in ways that are intended to achieve these goals. Polygyny and fertility are highly valued among all Maa-speaking pastoralists [e.g., Samuru [Spencer 1965, 1973], Maasai [Jacobs 1965, 1973]], including the Mukogodo, and a desire for more children is nearly universal among Mukogodo women.

In examining the reproductive aspects of the Mukogodo transition to pastoralism, the main questions are to what extent the acquisition of livestock was a means of obtaining mates for Mukogodo males [a mating strategy] and to what extent it was a means of investing in offspring [a parental strategy [see Low 1978:198–99]]. Livestock acquisition might justifiably be seen as a mating strategy if increased intermarriage with their neighbors and the introduction of livestock as bridewealth set in motion a process of bridewealth inflation that made it necessary for Mukogodo men to obtain livestock in order to marry. The evidence from our fieldwork suggests that this in fact was the case.

From December 1985 to January 1987 my coworker Beth Leech and I gathered data that included, among other things, a complete census of living Mukogodo, genealogies of all 13 Mukogodo lineages going back in most cases to the middle of the 19th century, bridewealth estimates for more than 400 Mukogodo marriages since the 19th century, notes on the history, social organization, and customs of the Mukogodo and their neighbors, complete reproductive histories of nearly all living menstruating or circumcised Mukogodo women, and historical records from the Kenya National Archives. Maa was our principal fieldwork language. Ages and the dates of past events were estimated with reference to the age-set chronology and to other historical events of known date. At least one of us was able to see and meet nearly every individual resident in Mukogodo during our stay there, and we made regular visits about every six weeks to about half the population.

When possible, bridewealth estimates were obtained from individuals close to the marriage, such as the groom or the bride’s father. When this was not possible, estimates were obtained from senior members of the lineages of the bride and groom. When both parties to the marriage were Mukogodo, at least two estimates were usually obtained, and such multiple estimates were averaged for comparisons with other bridewealths. We had close relationships with several members of one of the Mumbonyot lineages as well, and I was able to obtain estimates from them for many marriages between their lineage and the Mukogodo. Even for marriages that occurred many decades ago, most estimates agreed rather well. Of more than 400 marriages, there were only 2 for which one informant said that the bridewealth consisted of beehives while another said livestock.

Despite the fact that the transition occurred over 50 years ago, the data that are most important for this discussion appear to be of high quality. Marital data collected in 1986 agree well with census data collected in the early 1930s, supporting the reliability of both sources. Also, men who had left no descendants and women who had married out, two of the types of people most likely to be forgotten by informants in tracing genealogies, were reported in large numbers. Therefore the figures used here for these types of people may very well be low estimates.

The number of marriages with bridewealth payments in beehives began to decline early in the century, and the last marriage in which beehives were part of the bridewealth took place in about 1931 [fig. 2]. [The timing here is important, because if the switch to pastoralism had occurred first, the bridewealth change might have been merely a result of it.] Mukogodo men would have found not only that a shrinking pool of potential mates could be obtained with beehives but also that a much larger supply of women, both Mukogodo and non-Mukogodo, was available to men with livestock. The change in bridewealth coincided with increased rates of intermarriage between the Mukogodo and their neighbors. In the 19th century there are no recorded marriages of Mukogodo men or women with non-Mukogodo individuals, although there are a few cases in which the ethnicity of one of the partners is unknown. Between 1900 and 1939, 39.6% of all marriages involving Mukogodo were between Mukogodo women and non-Mukogodo men and 6.6% were between Mukogodo men and non-Mukogodo women [fig. 3]. There are no known cases of a non-Mukogodo’s paying beehives for a Mukogodo bride, and there is only one of a Mukogodo’s paying beehives for a non-Mukogodo bride. In about 1900 a Mukogodo man is reported to have paid a bridewealth consisting of three beehives, an elephant tusk, and a cow for a ling’wesi woman. This exception suggests that beehives were not enough.

Because the number of Mukogodo women marrying outside the group was much larger than the number of non-Mukogodo women marrying into it, the Mukogodo experienced a severe shortage of women. The female proportion of the combined non-Mukogodo adult populations was nearly twice that of the Mukogodo adult population in 1934 [fig. 4], a difference that is highly significant \( t = 3.816, p \) (one-sided) \(< .0005\). This must have increased the incentive for men to obtain livestock.

The situation was made more urgent by the fact that Mukogodo had to pay more for non-Mukogodo women than non-Mukogodo men did for Mukogodo women [fig. 5]. Between 1900 and 1939 they paid an average of more than four times as many small stock and one and a half times as many cattle for non-Mukogodo women as non-Mukogodo men paid for Mukogodo women. One possible reason is that, as the poorest people in the area, they could not afford to drive as hard a bargain as others. Another possibility is that, if the Mukogodo generally had poorer diets than their neighbors, Mukogodo girls were less plump and matured later than others. Borgerhoff Mulder (1988) has shown that among the agropastoralist Kipsigis of western Kenya, higher bridewealths are paid for early-maturing and plump brides, and early-
maturing Kipsigis women have higher lifetime reproductive success than late-maturing ones. If the same relationship between maturation and reproductive success existed among Mukogodo-area peoples, this could have reduced the amount that men were willing to pay for Mukogodo girls.

At the same time, a desire to establish affinal ties with wealthy people may have made Mukogodo willing to pay more for girls from other groups. Advantages to wealthy, high-status men in bridewealth negotiations have been noted among other peoples, such as the Swazi of southern Africa [Kuper 1978], the Hageners of New Guinea [Strathern 1980], and the LoWiili of Ghana [Goody 1969]. Among the Kipsigis, however, Borgerhoff Mulder (1988) found no evidence of a relationship between the relative wealth of brides’ and grooms’ fathers in bridewealth payments. She notes in explanation of the Kipsigis data that wealth differentials are unstable, there is a lack of binding obligations between affines, and other support systems, such as lineages and age-sets, are available in times of trouble. Among the Mukogodo and other Maa-speaking pastoralists, in contrast, wealth differentials are relatively stable [especially insofar as the Mukogodo have long been the poorest people in their area], and affines are expected to aid one another in both good times and bad. These key differences between the Kipsigis and the peoples of the Mukogodo area may make the relative status of wife givers and wife takers a significant factor in bridewealth negotiations here. Additionally, Maa-speaking pastoralists expect a man to continue to give livestock to his affines after the formal bridewealth has been paid. Among the Samburu, for ex-
ample, marriage is followed by “ceaseless beggings” for more cattle from the husband on the part of his in-laws, making it important “whether the suitor is [or is likely to become] wealthy in cattle” (Spencer 1973:105). Because Mukogodo men would have been in a poor position to make continuing gifts, their prospective fathers-in-law may have insisted on larger than average bridewealth payments.

Perhaps the greatest problem the Mukogodo faced in their bridewealth negotiations, however, was the social stigma attached to their status as hunters. From their point of view the Maasai, people who live off wild game are *il-torrobo*. This word’s origins are obscure, and it is difficult to translate, but it is highly derogatory. In Kenyan English and Swahili it has become “Dorobo” and “Wandorobo.” People called Dorobo are associated with offensiveness, meanness, poverty, cowardice, womanishness, degradation, imperfection, degenerate-

ness, and contamination (Galaty 1979, 1981, 1982). A Maasai myth of origin links them to an original fall from grace, a Dorobo being said to have shot an arrow to sever the cord connecting heaven and earth, down which God had been sending cattle (Hollis 1905:271; Jacobs 1965:26–27). Maasai and Samburu hire Dorobo to perform disgusting and polluting tasks such as circumcisions (Hollis 1905:297; Spencer 1973:86). Samburu consider it shameful to marry one’s daughter to a Dorobo and believe that Dorobo girls make unruly and disrespectful wives (Spencer 1965, 1973). From the point of view of the main body of the pastoral Maasai and Samburu, Mumononyot, Ilng’wesi, and Digirri were also Dorobo, but Mukogodo carried the greatest stigma because of their heavy and more recent reliance on hunting. They may have had to compensate for their status by paying more for non-Mukogodo wives and accepting less for their daughters.

**Fig. 4.** Female percentages of the adult populations of Mukogodo-area ethnic groups in about 1934 (District Commissioner 1934).

**Fig. 5.** Mean livestock components of bridewealth payments, 1900 to 1939, by the ethnic groups of the brides and grooms, showing standard deviations. Stippled bars, sheep and goats (*t* = 2.58; *p* < .01; solid bars, cattle (*t* = 1.94; *p* < .05).
The transition to cattle as bridewealth was particularly difficult for men who became eligible for marriage in the course of it, namely, those of the Meruturot and Tiyeki age-sets, an unusually high proportion of whom never obtained wives [fig. 6]. Even in 1986 there were still several men of the Tiyeki age-set alive who had never had a wife. None of the men in 2 of the original 13 lineages married during or after the transition, and today there are only 11 lineages.

Thus it would appear that livestock acquisition was indeed a mating strategy for Mukogodo men. In addition, it might justifiably be seen as a parental strategy [1] if, in the absence of any new shortage of wild foods at the time of the transition to pastoralism, there was an increase in female fertility, child survivorship, or both or [2] if, despite a new shortage of wild foods, previous levels of fertility and survivorship were maintained.

If the transition to pastoralism increased the food supply, this might have improved the health and lowered the death rates of both children and mothers. More food for women might also have allowed them to begin their reproductive careers earlier and to shorten birth intervals. According to the critical-fat hypothesis [Frisch 1978, 1988], a certain percentage of body fat is necessary to trigger puberty, to maintain a normal menstrual cycle, and to reestablish menstruation after pregnancy. Though the hypothesis is controversial [see Bongaarts 1980, Scott and Johnston 1985], body fat has been cited as contributing to variable female fertility in a number of studies. In a recent study of the foraging Ache of Paraguay, for example, Hill and Kaplan [1988:295–96] note that heavier women have more reported live births and lower infant mortality than lighter ones.

Again, if the change to pastoralism reduced load carrying for women, it might have reduced the length of time between births. It has been argued for the !Kung San of Namibia and Botswana that the difficulty of carrying two children on gathering trips makes it advantageous to space births widely [Blurton Jones and Sibly 1978]. The same might have been true among the Mukogodo. Pastoralist Mukogodo women must still gather firewood and water, but since pastoralist settlements are generally much larger (averaging about 20 people) than cave households (probably averaging about 10 or fewer), mothers might have cooperated in child care rather than haul their babies around after the transition.

Finally, by making milk available as a weaning food the transition to pastoralism might have enabled women to nurse for a shorter time and thereby decrease birth intervals. Mukogodo know that it is usually necessary to wean one’s current child before one can become pregnant again (because of the suppression of ovulation by lactation). However, even today children are not weaned until they are at least two years old, at which point they are able to eat a wide variety of solid foods.

In the case in which it is assumed that no new food shortage was experienced, the effects of the transition on the reproduction of Mukogodo females can be evaluated directly, by examining their fertility and mortality before, during, and after it, and indirectly, by comparing Mukogodo fertility and mortality since the transition with that of other modern foraging societies for which we have good demographic data.

At first glance, there does seem to have been some increase over time in the number of children surviving to age 15 [fig. 7]. A simple regression of number of children surviving to age 15 against year of birth yields an adjusted multiple squared R of 0.165. In other words, year of birth appears to explain a substantial, although not overwhelming, proportion of the variance in female reproductive success. This result may, however, be due simply to the inevitable deterioration in the quality of the demographic data as we look farther back in time. In figure 8, which shows the same women coded by whether their husbands paid bridewealth in beehives or in livestock, the women paid for with beehives have an upward-sloping regression line of surviving offspring against year of birth, suggesting that even if there had
been an increase in reproductive success over time it could have begun before the transition to pastoralism. Furthermore, the data points tend to fan out from the regression line as they approach the present (in technical terms, the residuals show heteroscedasticity). This suggests that the number of persons forgotten by genealogical informants increases as we look farther back in time. Finally, the individual indicated with an exclamation point, who appears to have had unusually high reproductive success for her era, was the wife of the founder of the lineage of my best genealogical informant. Since the data for her are probably among the most accurate, the other figures for women of her era are probably too low. In summary, when we look at the Mukogodo alone, the evidence is not convincing that they experienced an increase in either fertility or child survivorship.

Data on female fertility for several hunting-and-gathering societies are displayed in Table 1. Because Mukogodo women reported an implausibly small number of infant and childhood deaths, the total fertility rate since the transition to pastoralism had to be estimated, as follows: The mean number of children surviving to age 15 born to women who were 45 or older in 1986 and whose reproductive careers occurred primarily after the transition is 5.63 (N = 43). If we assume that mortality among Mukogodo from birth to age 15 is at least as high as that for Kenya as a whole, then we can use Kenyan census figures (Central Bureau of Statistics 1981:114) to estimate a total fertility rate for Mukogodo since the transition of 6.91. This is a conservative estimate, because death rates are probably higher among the Mukogodo than among the majority of Kenyans as a result of their poverty and isolation and the relative scarcity of health care. If, as is probable, actual Mukogodo mortality in the 0–15 age-group is higher than the Kenyan average, then the total fertility rate, which includes all live births, will be higher. Although the total fertility rate estimate of 6.91 is at the high end of the range for these modern hunter-gatherers, it is not high enough for us to conclude that Mukogodo fertility or child survivorship necessarily increased after the transition to pastoralism.

Even if the reproductive success of Mukogodo females stayed about the same, the acquisition of livestock might still have been a parental strategy if there was a shortage of wild foods at the time. There is, however, no evidence of any such shortage. As far as can be determined with the limited information available, game appears to have remained as abundant as before. A government surveyor reported in 1936 that game was so abundant in the lowlands immediately east of the Mukogodo forest (part of the traditional Mukogodo hunting area) that it depleted grazing that would otherwise have been useful for livestock (Fannin 1936:4). In a report on a safari through part of the Mukogodo area in 1943, another official wrote, "The whole of this area was teeming with game, fresh tracks of elephant and rhino being seen everywhere, and giraffe must inhabit that area literally in thousands" [District Officer 1943]. Just west of the Mukogodo area it was noticed in the 1920s that not only was there a general abundance of big game but also alienation of land for white settlement was driving smaller animals northward into unalienated territory [District Commissioner, Laikipia 1921]. If the same thing occurred when farms were alienated south of the Mukogodo area, the local game populations could even have been increasing during the transition to pastoralism. Mukogodo themselves have mixed memories about the abundance of game before the transition, some re-
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*Estimates based on an average age at first birth of 18.5 years, an average birth interval of 3.2 years, and an assumption that menopause occurs between 40 and 45.

membering a time of plenty while others recall the difficulty of searching through the forest for food.

It might be suggested that the problem was not so much game depletion as an increase in the human hunting population. Indeed, many non-Mukogodo did move into the area in the early part of this century, but the hunting population probably increased little if at all. The total Mukogodo population in 1906 was about 165, while in 1936 it was only 237. The few hunters among the Ilng’wesi were deported from the Mukogodo area in 1925. In fact, throughout the period of the transition the hunting population probably dropped rapidly as more and more people took up herding. Even if there had been an increase in the hunting population, the Mukogodo area was never fully exploited, and when Mukogodo left their remote caves and hunting territories for areas with better grazing, no hunters came to take their places.

Another possibility is that plant foods, rather than game, became scarce. Urs Herren, a Swiss anthropologist now working among the peoples of Mukogodo Division, has been told by some informants that this is true of several formerly important plant foods. My own informants were not consistent on this topic. If in fact a few important species did become scarce, however, other species were available as replacements, and Mukogodo now eat several abundant wild plant foods that they did not often eat before the transition to pastoralism. Furthermore, large tracts of wilderness covering the full range of local environments were uninhabited and unexploited. If Mukogodo had faced a shortage of certain plant foods, they could easily have shifted to different species and expanded their gathering into virgin areas of the forest. A radical subsistence change to pastoralism would have been unnecessary.

In summary, although it remains possible that the acquisition of livestock was a way for the Mukogodo to provide their families with a better food supply, the available data do not show that the transition significantly improved female fertility or child survivorship. There is also no clear indication that there was any shortage of wild foods that would have encouraged the development of a new subsistence base.

**DISCUSSION**

There is strong support for the hypothesis that increased intermarriage with non-Mukogodo and subsequent bridewealth inflation made it necessary for men to obtain livestock in order to marry. It remains possible that the acquisition of livestock was a way for men to feed their families better, but the available data suggest that obtaining livestock is better seen as a mating than as a parental strategy for most Mukogodo men.

Why did Mukogodo fathers prefer cattle to beehives in the first place? The number of beehives in a typical bridewealth payment before the transition was about the same as the number of cattle given afterward, but at the time a cow was worth several goats and sheep while a beehive was worth at most only one. Mukogodo men may also have realized that with a change from hunting and gathering to pastoralism their families’ day-to-day workload would shift from them to their wives and children. In the cave period, men were directly responsible for supplying most of the food (meat and honey probably formed the bulk of the diet). Livestock-owning men, in contrast, usually leave the daily herding and milking to women and children and, apart from supervision of the herds and some occasional and exceptionally difficult herding, do little work around their homes. House building, too, is a woman’s job. One Mukogodo man who had experienced the transition said that although game had been plentiful, one had had to search for it in the forest, and it was better to have a food source right at home. Another man liked the fact that livestock allowed increased mobility: “Beehives are in trees, cows have legs.” Men may also have desired cattle simply as signs of wealth, as additional sources of food for themselves and their families, and, of course, as the new currency of marriage.

Why did non-Mukogodo men want to marry Mu-
kogodo girls, given their tainted Dorobo status? Especially in this century, the status of the Mumonyot, Illng'wesi, and Digirri may not have been much higher than that of the Mukogodo, since all three groups were poor compared with the Samburu and pastoralist Maasai. Hence the stigma attached to marrying a Mukogodo girl may not have been too severe. Even Maasai consider Dorobo "appropriate wife-givers, with less than normal bride-wealth being given, but inappropriate wife-takers, since they have no cattle with which to reciprocate" (Galaty 1982:7). Affinal ties to Mukogodo may, as I have suggested, been useful in establishing claims to residence in the Mukogodo area in the eyes of the British. Mukogodo girls apparently cost less than girls from other groups. Finally, Maa-speaking pastoralists consider number of wives and children a key measure of success, and the benefits of an additional wife may have more than compensated for any loss of prestige a man may have suffered through marriage to a Dorobo.

Why did the Mukogodo not simply combine herding with foraging? Good grazing is often not located near the best hunting grounds and is particularly inconvenient to good trapping and beehive placement areas in the forest. As people left their territories in search of pasture, it was difficult for them to return to their territories to hunt and to place and tend beehives and, since traps need to be checked frequently, practically impossible to continue trapping. Perhaps most important, when the Mukogodo intermarried with their Maa-speaking neighbors, borrowed Maasai customs, and obtained livestock, they became part of a system in which hunting was despicable. To continue with it would have perpetuated their low status.

Why did the Mukogodo not simply agree to continue to marry each other for beehives, thus enabling most and perhaps all Mukogodo men to obtain wives? This question reflects a misunderstanding of the process of change. It was fundamentally an individual-level process that had results for the group but did not occur to them as a group. The transition was the unplanned and unforeseen outcome of many decisions made over a period of several years by individuals acting separately, not in concert. Not only did the Mukogodo lack any kind of organization that could have served as the basis for a protectionist agreement but also they would have faced the problem of individuals' defecting from the pact. There would have been very little reason for anyone given an opportunity to obtain livestock by marrying his daughter to a man from another group or to obtain a wife from another group in exchange for livestock to abide by such an agreement. It almost certainly never occurred to any Mukogodo to propose such an agreement at the time of the transition.

Contrary to what one might expect from a more traditional ecological or economic perspective, the Mukogodo transition from foraging to pastoralism was probably due neither to a change in the physical environment nor to technological improvements. Instead it was due to adaptive responses of individuals to changes in their social and reproductive relationships with people from other groups and among themselves. This episode demonstrates the importance that individual reproductive interests and strategies may have had throughout human history.

The Mukogodo transition to pastoralism may exemplify processes of sociocultural change that are widespread in Africa and elsewhere. Imitation of more prestigious groups, for example, has been identified as one of the main themes in East African culture change since prehistory (Kesby 1977:228). The Maasai in particular have been emulated by many peoples. The low prestige of hunting has been mentioned as a reason given by some San/Basarwa for turning to agriculture (Hitchcock and Ebert 1984:347). More significant, bridewealth inflation has been documented among the Kipsigis (Borgerhoff Mulder 1988:68), the Kikuyu (Ferraro 1976), and the Nandi (Langley 1979) of Kenya, the Tsonga of South Africa (Kuper 1981), the Tonga of Zambia (Colson 1958:335), the Ibo and other peoples of eastern Nigeria (Committee on Bride-Price 1955), and the Okiek, another group of Kenyan foragers-turned-pastoralists (Hobley 1903; Huntingford 1928, 1929, 1935; Blackburn 1982b). In most of these cases economic change probably preceded and helped instigate bridewealth inflation, the reverse of the Mukogodo experience. Yet men in these societies, like Mukogodo men, may have felt pressure to change their economic behavior to adjust to the new bridewealth patterns. In this way, reproductive and social needs can have effects on a society's economy. Bridewealth is an important subject for further study for precisely this reason: it is at the crossroads of research on marriage, reproduction, social relations, economic relations, and subsistence, and its analysis can provide unique insights into the relationships among these different aspects of life.

The Mukogodo transition to pastoralism also shows that secondary transformations from foraging to food production can occur both rapidly and without the total displacement or elimination of indigenous groups. This may shed light on such transformations in prehistory. For example, the Mukogodo experience increases the plausibility of Bogucki's (1987) proposal that interaction between indigenous foragers and immigrant farmers may have been important in the spread of food production on the North European Plain.

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