Why the Hadza are Still Hunter-Gatherers

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Introduction

For several years there has been a heated disagreement over the status of foragers in southern Africa, what has come to be called the, 'Kalahari debate. One side argues that when first studied, the Ju/'hoansi (Dobe !Kung, or !Kung San) approximated pristine foragers, "on the threshold of the Neolithic," (Lee 1972: 352). The other side argues they were (along with other San speakers), dominated, enserfed, or enslaved by their Bantu pastoralist neighbors, possibly even ex-pastoralists themselves, forced into foraging because they had lost their herds (Wilmsen 1989). Much of the debate turns on the issue of contact between the Ju/'hoansi and non-foragers (Wilmsen 1989; Wilmsen 1993; Wilmsen and Denbow 1990; Lee and Guenther 1995). From the perspective of the Hadza (also called Hadzabe, Hadzapi, Hatsa, Tindiga, Watindiga, Kindiga, Kangeju, Western Hadza: Wahi), a foraging society in East Africa with whom I work, this concern with contact seems exaggerated. That is because the Hadza have had contact with non-foragers at least for the past century and yet they have persisted as foragers, in many respects I will argue, little changed. By examining the case of the Hadza, I hope to shed some light on the broader issues at stake in the Kalahari debate.

To one looking in from the outside, the most interesting question raised by the Kalahari debate is perhaps the extent to which foragers in the ethnographic record are useful models of pre-agricultural societies. Revisionists, like Wilmsen (1989; 1993) have argued that the picture of the Ju/'hoansi portrayed by Lee (1979), which has become such a standard model of Pleistocene life, is a myth. Based largely on arguments about contact with non-foragers, Wilmsen claims the Ju/'hoansi would be better described as the rural proletariat who are denied access to other means of production, than as pristine foragers. If contact with non-foragers is so important, perhaps only the earliest descriptions of some Australian, Andamanese, and Arctic societies would qualify as candidates for uncontaminated models of the past.

But how crucial is contact with non-foragers? Does even the slightest degree of contact with non-foragers mean a foraging society ceases to be 'true foragers'? This seems to be what revisionists imply. They claim, however, to be challenging the very notion of contemporary foragers as models of the past. Wilmsen and Denbow (1990) criticize Lee for describing the Ju/'hoansi as being "on the threshold of the Neolithic," saying, "Surely to remain among the few representatives of a way of life that everyone else gave up 10,000 years ago is to be a living fossil. If one has a history one is not on the threshold of an earlier time; one may forage and do nothing else without retaining an atavistic forager mentality and without being any more representative of foragers 10,000 years ago than are modern Bantu agropastoralists…" (1990: 503). That may well be possible, but it seems far more likely the Ju are more representative of foragers 10,000 years ago than are modern Bantu agropastoralists.

For one critical of the very notion of 'pristine,' Wilmsen seems to reify it. His insistence that contact with non-foragers invalidates Lee's picture of the Ju/'hoansi implies that lack of contact would at least be necessary, if not sufficient for contemporary foragers to be good models of the past. The importance of contact depends on what one wants to study. For example, even secondary foragers who once owned cows might be a valid society in which to study how individuals allocate their time when they must hunt and gather all their food rather than cultivate it. They may be less instructive regarding traits subject to strong cultural inertia. Certainly it is true, as the revisionists argue, that time has not stood still for foragers, even for those without contact, and the living fossil idea has rightly been challenged. However, since some foragers like the Hadza have continued to forage long after they have been in contact with agriculturalists, we must entertain the possibility that many other aspects of their lifestyle have also remained unchanged. Often contact does spell the end of foraging but not always; when it does not, we must ask why not, and we must ask what other traits are conserved. Here, I use the case of the Hadza to explore those issues and answer the question, "Why are the Hadza still hunter-gatherers?"

The Hadza

The Hadza are hunter-gatherers who live in the eastern rift valley in northern Tanzania. In many ways they resemble the Ju/'hoansi of Botswana (Lee 1984) as they were until the 1970's. Not only do they have a similar tool kit, hunt many of the same animals and gather some of the same plants, live in almost identical huts, and have a similar mating system, but they speak a language with clicks. These clicks (and some etymologies) have caused many researchers to classify them together with southern African Khoisan speakers (Bleek 1931; Fleming 1986; Ruhlen 1991; but see Woodburn 1977; Sands 1995). Recent evidence suggests that unlike the click language of the Sandawe, (who live a mere 130 km to the south of the Hadza) which is related to San languages, Hadzane (the Hadza language) may be a linguistic isolate, only very distantly related to San languages (Sands 1995). Hadzane is not at all related to any language of the immediate neighbors of the Hadza, a fact that suggests the Hadza have maintained a considerable degree of autonomy.

The Hadza population has been increasing slightly since 1900 and today is about 1000 (Blurton Jones et al. 1992). The Hadza live around Lake Eyasi, a large salt-water lake that almost completely dries up in the dry season. About 250 live to the west of the lake and have been little studied. The other 750 live to the east of the lake in an area about 2,500 km^2 (Figure 1). Although both groups come and go freely, it is the Eastern Hadza I will describe here since I know them best. Among the Eastern Hadza, about 200-300 still live almost exclusively from hunting game, collecting honey, digging tubers, and gathering berries and baobab fruit (Marlowe 1999). The remaining 450-550 Eastern Hadza shift between foraging and various other activities. Some Hadza guard the maize fields of their neighbors from animals, especially vervets and baboons, receiving maize in return, as well as eating the meat of the monkeys they kill. Some Hadza do labor on the two large European farms in the Mangola area. From time to time, a Hadza may work as a game scout or work for the game department. A few Hadza have paid government positions as community development officers. A growing number of Hadza depend on tourist money. Because I have been interested in studying foragers, I have spent most of my

time with those Hadza least assimilated. Much of what I say is therefore, biased towards the 200-300 most bush-oriented Hadza.

Virtually all Hadza, with the exception of very young children and some older women, speak Swahili fluently as a second language. Hadzane, however, is not in any immediate danger of being lost even though many words have been borrowed from Swahili and other languages in the area. This use of Swahili is fairly recent. According to Woodburn (pers comm), when he arrived in 1958 few Hadza knew Swahili. Instead, many knew Isanzu, the language of their Bantu neighbors to the south. The acquisition of Swahili appears to reflect an increase in its use as a lingua franca by all ethnic groups in Tanzania, rather than an increase in the degree of contact with non-Hadza. Swahili has simply replaced Isanzu as the second language of most Hadza.

The Hadza have acquired very little of their neighbors' religions. Their own religion is minimalist. They do have a cosmology and men can tell endless stories about how things came to be. They do not believe in an afterlife and there are few religious restrictions. There are few rules in general, and what few there are often go ignored with little consequence, except for the rules about eating the men's special epeme meat. Illnesses may be attributed to violation of these rules (Woodburn 1979). The most important ritual is the epeme dance. In camps with enough adults this takes place after dark on moonless nights. Men wear bells on their legs, a feather headdress, a cape, and shake a maraca as they sing and dance one at a time in a call-and-shout manner, inspiring the women to sing and dance around them. The other main ritual is the Mai-toh-ko, or female puberty initiation, which happens when the berries are ripening. Pubertal girls gather in a camp where they are covered with animal fat and adorned with beads, then chase boys and try to hit them with their fertility sticks.

Neighboring Groups

Archeological evidence shows that farmers and pastoralists have been in the general area of Hadza country for several centuries (Sutton 1992). The three groups of neighboring people with whom the Hadza interact most nowadays are the Cushitic Iraqw, the Nilotic Datoga, and the Bantu Isanzu. These 3 ethnic groups belong to 3 different linguistic phyla, and Hadzane belongs to a fourth, so none of the four languages is closely related (Ruhlen 1991).

The Iraqw (also called the Mbulu) are Cushitic speakers who migrated south from the region of Ethiopia. They have been in northern Tanzania for perhaps 3,000 years (Ehret 1974; Ochieng 1975; Ambrose 1982; Sutton 1992). The Iraqw live in the highlands where rainfall is plentiful and are primarily maize farmers. Remains of irrigation channels, probably built by the Iraqw (part of the Engaruka complex), have been found near Endamagha in the northern end of Hadza country (Sutton 1986). These fields were abandoned around 1700 AD, possibly as a result of over-exploitation, or because the climate became drier (Sutton 1990). However, this was also at the same time the Maasai were expanding into the area. In the 1800's the Maasai expansion caused the Iraqw to take refuge in the Mbulu highlands flanking Hadza country to the east. During the past two decades the Iraqw population has been growing rapidly (3.5% per year) and is now over 230,000 (Meindertsma and Kessler 1997). Consequently, many Iraqw have moved down from the highlands into Hadza country, clearing trees and trying to make a go of maize farming in areas poor for cultivation but where hunting and gathering has in the past at least, been good for the Hadza.

The Datoga (also called Tatog, Barabaig, and Mangati) are Nilotic pastoralists who number 15-20,000 (Meindertsma and Kessler 1997). It is not clear when they arrived in Hadza country but they have probably been in the general area since the 1700's, when the Maasai expelled them from Ngorongoro Crater (Sutton 1990), which borders Hadza country on the north. Under German rule, Maasai expansion was checked and inter-tribal warfare and cattle raiding curtailed, causing Datoga herds to expand (Klima 1970). In response to Iraqw movement, the Datoga were also pushed out of current Iraqw areas. We know they have been interacting with the Hadza at least as early as 1917 (Bagshawe 1925). However, it was only in the 1930's and 40's that Datoga began moving into Hadza country (Tomita 1966; McDowell 1981). Today, the most bush dwelling Hadza interact more with the Datoga than any other group. The herds of the Datoga drink the scarce water in Hadza dry season waterholes and eat much of the vegetation needed to support wildlife, which poses one of the main threats to continued Hadza hunting. In addition, in the past according to the Hadza, Datoga would occasionally kidnap Hadza women. Even today, some Hadza women are afraid when they are out gathering and see Datoga men.

From time to time, violent conflicts have occurred. For example, Hadza tell of cases in this century when Hadza who killed and ate cows were pursued and killed by posses of Datoga. Despite this conflict, Hadza individuals continue to trade with and beg from Datoga but do not work for them.

The Isanzu are Bantu agro-pastoralists who live to the south of Hadza country. They may have been in the general area since about 1500 AD (Nurse 1982; Soper 1982; Newman 1995), part of the continuing Bantu expansion into east and southern Africa. Hadza access to iron could possibly extend this far back, since the Bantu introduced iron to the rift valley area about 1500 AD, though iron was used near Lake Victoria in Western Tanzania at least 2,000 years ago. Isanzu oral tradition tells of colonizing the area near Isanzu and Kirumi around 1850 (Cooper 1949). At least from the turn of the 20th century until the 1960's, the Hadza interacted more with the Isanzu than with any other neighbors. Early European visitors used Isanzu guides and interpreters to communicate with the Hadza (Obst 1912; Bagshawe 1925; Bleek 1931) and there appears to have been much more intermarriage with Isanzu than with Iraqw or Datoga. The Hadza trace descent bilaterally and anyone with one Hadza parent is considered Hadza. There are perhaps 5% of Hadza today who have an Isanzu parent, and some Hadza live on and off with Isanzu at one spot called Numba Sita. The Hadza do not make alcohol but nowadays they often get beer from Isanzu, as well as Datoga. The Hadza do not practice witchcraft but often say they fear the powerful witchcraft of the Isanzu.

Other groups with which Hadza also have contact are the Sukuma, and Iramba, who are Bantu, and the Maasai who are Nilotic. The Sukuma live west of Lake Eyasi and interact mostly with the Western Hadza. They have for a very long time been making trips in caravans to obtain salt from Lake Eyasi (Senior 1957). Today in the Mangola area the Hadza also have contact with a variety of "Swahilis" as the Hadza refer to generic Tanzanians (and here I do as well). These Swahilis have moved into the area to grow onions beginning in the 1940's, though there were very few until the 1960's and 70's. In 1962, there were about 900 taxpayers in Mangola (Woodburn 1962). Hadza also have contact with the 3 European families in Mangola, one of which settled there in the 1950's, though the first German plantation began there in 1928 (Tomita

1966). Researchers from Europe, Japan, and the US have been studying the Hadza regularly since the 1960's and now there are increasing numbers of international tourists as well.

History

Hadza country is only about 50 kilometers south of Olduvai Gorge and the Laetoli footprints, where evidence of hominid occupation dates to 3.6 million years ago. On the eastern edge of Lake Eyasi, a few hominid remains and associated tools were discovered by Kohl-Larsen in the 1930's and recently estimated to be 130-200,000 years old (Mehlman 1987; 1988; 1991). Of course there is no way to know just how long Hadza ancestors have been there but, as evidenced by lithic materials, there has been continuous occupation of the Eyasi Basin at least since the Middle Stone Age (Mabulla 1996). There is a consistent pattern of mobility and use of rock shelters right through to present day Hadza campsites. Given the location of landmarks with Hadza place names, it appears the Hadza have long occupied all their current range and a bit more (Blurton Jones pers comm), most of which they had largely to themselves as late as the 1950's (Woodburn pers comm).

The earliest written accounts mentioning the Hadza are those of German explorers in the 1890's (Baumann 1897). However, these accounts are only second-hand descriptions of the Hadza as provided by guides, along with direct observations of Hadza huts and wooden pegs in baobab trees, which the Hadza use for climbing up to get honey (see references in Blurton Jones et al. ND). Presumably, the Hadza were hiding from these early European travelers, as they did originally in 1917 from Bagshawe (1925). The earliest written accounts of actually seeing Hadza are by Otto Dempwolff (1916) in 1910 and the German geographer Erich Obst (1912) in 1911, who spent 8 weeks with the Hadza.

At the first camp Obst visited on the eastern edge of Yaeda valley, Hadza (Wakindiga) were living with Isanzu (Waisanzu). Obst said, "Of the fifteen men, eighteen women and twenty-two children who I met in the camp, barely half – seven men, as many women and eleven children – identified themselves as real Wakindiga. The rest were Waisanzu, who were too lazy to farm at home, or who had to escape the reach of the Boma because of some kind of misdemeanor." For this reason, Obst decided to move on to another camp in Mangola where he

was told, "…the inhabitants would be exclusively Wakindiga," and he hoped less influenced by Isanzu ways (Obst 1912:3).

Obst described the Hadza as strictly foragers who kept no animals, not even dogs. However, because they had words for some domestic animals and because Obst felt these were not borrowed words, he speculated that the Hadza might have once been pastoralists. Because Obst was told of wars between the Hadza and Maasai and because he figured that the Maasai would only be motivated to fight with other pastoralists, he took this also as an indication the Hadza may have been pastoralists who lost their herds. He notes however, the Hadza had no memory or stories of having ever been farmers or pastoralists. Perhaps Obst was influenced by those neighbors who, in their condemnation of Hadza backwardness, often say the Hadza are not a real tribe or culture, only an amalgam of the dispossessed, "who don't even have a real language" (Woodburn 1997). This view reflects ethnocentric bias rather than any evidence. Hadzane, for example, is certainly not a pidgin language.

The Hadza told Obst they always had to be ready for war with the Isanzu, Iraqw and Maasai. They also told him that the Isanzu sometimes captured women and children. It is possible the Isanzu were capturing Hadza for the slave trade, since there was an Arab slave trade route up until the 1870's only about 250 kilometers to the south of Hadza country. Obst was told the danger from the Isanzu subsided once the elephants became rare, so presumably the Isanzu were also involved in the ivory trade. The Sukuma, he says, came from further away and gave old hoes which the Hadza pounded into arrow points in exchange for getting to hunt elephants, but he doesn't say whether it was only for meat or for ivory, nor does he say how they hunted them. Elephants are the only big game that Hadza do not hunt today because they say their poison is not strong enough to kill them. Obst mentions the Iramba, Maasai, Sukuma, Isanzu, and Iraqw but not the Datoga, suggesting interaction with them came later.

Obst described plentiful game of all sorts but said once the elephants became rare enough, the Isanzu began to interact peacefully with the Hadza. He said the Hadza took up the practice of circumcision and occasionally pierced their earlobes and inserted an Isanzu metal adornment. Men wore braided strings around their wrists and upper arms. Little girls wore a

genital pendant of braided grass decorated with beads, which was exchanged at age 8-10 for a leather apron and loincloth. Women wore gigantic bead necklaces and brass spirals around their necks or lower arms, which he says they copied from the Isanzu. But in isolated camps, only leather ornaments were worn.

Obst said of the Hadza that he never saw such concerned mothers and active family fathers, even when a man had two wives. He also said a Hadza man would never marry his daughter off to any man she did not love. He noted they practiced the levirate (as they do today), but he also said that a man could marry anyone other than his mother or sister and that one man even married his granddaughter, something unknown today.

The next observer of the Hadza was F. J. Bagshawe, a district officer of the British government who made several trips to Hadza country soon after the Germans were defeated in the First World War. According to Bagshawe (1925), a famine in 1918-1920 prompted some Isanzu to take up living and foraging with the Hadza. Although it is usually Hadza women who marry Isanzu men he said, during the famine some Isanzu women married Hadza men. Bagshawe said the Hadza kept no domestic animals, not even dogs or fowl. He tells a story about their one and only experiment in pastoralism. Once the Hadza killed an elephant (which as I mentioned, they do not do now), and in exchange for the ivory received some goats from a native stranger. Next morning the goats strayed into the bush and no one bothered to follow them because they were feasting on the elephant meat. Then the Datoga attacked, declaring the goats had been stolen from them, and killed many Hadza. This shows that at least since 1917, there has been some hostile interaction with the Datoga.

Bagshawe said the old men and women circumcised boys and girls but no ritual was involved and he felt the practice had only recently been adopted from neighboring tribes. Based on my interviews, I suspect he was right. Linguist Dorothea Bleek (1931) visited the Hadza in 1930 and said that circumcision was unknown to the Hadza. She also said they did not have tattoos, only small scars where medicine is rubbed in, as they do today, though these small lateral slits on the cheeks look almost more like aesthetic marks. She said two medicine men with slightly different dialects came from the far north wearing clothes of European stuffs with

spears and bags of medicine to visit the Hadza at Dondu, west of Eyasi. Hadza danced in a circle all day with the Medicine men in the center. That evening, 2 boys were tattooed and died from it. The next day two more were tattooed and also died. The third day only one Hadza medicine man was tattooed and the two visitors then left to visit other Hadza camps. These two visitors may well have been from another tribe (perhaps Datoga) or else were assimilated Hadza. Like Obst, Bleek found some Hadza who had large holes in their ear lobes into which paper (rather than metal) ornaments obtained from neighbors were inserted. Bleek also found Hadza sometimes getting meal (presumably maize or millet) from the Isanzu. The early accounts may have been somewhat biased toward assimilated Hadza since the writers themselves note the lack of borrowed customs among the most isolated Hadza.

In 1945-47, the British colonial game officer, B. Cooper (1949) visited the Hadza on two occasions for 10 days each time. He found there were some Hadza around an Isanzu village doing some cultivation. His guide was a Hadza whose father was an Isanzu who had lived in a Hadza camp to escape the hut tax. Cooper said that Hadza men sometimes cooperated in pairs or 3's to drive game into ambush (which they rarely do today) and that men followed the honey-guide birds to find honey (just as they do today). He described the Hadza as having no tribal authority but said old men govern their own camp. He heard of some medicine men and said that those Hadza on the fringe of Isanzu country paid some allegiance to the Isanzu chief. He said the Hadza were peaceful, settling disputes without bloodshed, that monogamy was the rule, with a few beads as brideprice. Cooper said the Hadza had a primitive religion, while Bagshawe (1925) claimed they had no religion, but Obst (1912) said it was difficult to find out anything about their religion beyond the fact that the sun was God and that prayers were said over dead animals.

When Woodburn arrived in 1958, he found about 400 Eastern Hadza still foraging (1968). At that time, the Hadza still had much of their area to themselves but there was an increasing influx of farmers into the Mangola area, and Datoga into Yaeda. Because there are many publications about the Hadza from this point on, I do not review them here (but see Table 1). Woodburn, and others since, have made a point of finding the best bush camps and spending more time with the Hadza. In some ways many of the later descriptions reveal less influence

from outsiders, either because such influence actually subsided, or because Hadza further from any of their neighbors or villages, had always been subjected to less outside influence. However, soon after Woodburn began work, it looked as if Hadza foraging would end as a result of a concerted attempt to settle the Hadza.

Settlement Attempts

The first attempt to settle the Hadza, which lasted barely a year, was organized by the British colonial government in 1939 (McDowell 1981 a). After the local scout in charge abused his authority, the Hadza left. In 1964 and 1965, soon after independence from Britain, the Tanzanian government (Mbulu district), with support from an American missionary, attempted to settle the Hadza at Yaeda Chini where a school and clinic were built. Hadza from even the most remote bush camps were taken to Yaeda in lorries, escorted by armed police. According to McDowell, "Many Hadza were taken ill and a significant number died, probably of respiratory and diarrheal infections" (1981:7). By early 1966, most Hadza left the settlement to return to foraging.

There was also a settlement established to promote agriculture among the Mangola Hadza at Endamagha from 1971-75. A school, 12 houses, and a dispensary were built, water piped in, and seed provided. The village roll book listed 31 Hadza men in 1973. Then food aid was cut and the government told Hadza there they could not hunt in the area. After a drought and crop failure in 1975, the Hadza left the settlement and returned to foraging. Although Endamagha is still where many Hadza are sent to attend boarding school, Hadza account for only about one third of the students there today.

From time to time, missionaries have provided food and encouraged Hadza settlement. One Hadza man who allies himself with missionaries has several times tried to persuade other Hadza to abandon foraging in favor of farming, even using force at times. There was once a school at Munguli in the southern part of Hadza country, where many Hadza lived. When a missionary at Yaeda Chini provided food, many Hadza went there and stayed as long as the food lasted, which was only a few months. Meanwhile, the school and land in Munguli were occupied by Isanzu (Woodburn pers comm). Likewise at Yaeda, the school and clinic built for the Hadza in the 1960's attracted various Swahilis who are still there. Another attempt at settlement in Yaeda

began in 1979 and the number of Hadza rose from 30 to 300 (Ndagala and Waane 1982) but today there are no Hadza living there.

There is now a fairly permanent settlement at Mongo wa Mono, which was established as a Hadza village in 1988. The number of people there varies greatly from about 20-80 and at any given time there might be 5-10 people growing crops or tending beehives with very limited success, so most still also forage some. Many people float in and out, and while there, simply wait for food deliveries from missionaries or aid workers. Missionaries sometimes come to Mongo wa Mono and try to make converts. Usually, they do not last longer than a few months. Hadza children and teen-agers often sing Christian songs, and the Hadza welcome the food provided by missionaries, but there has been little conversion to Christianity. Many observers felt the settlements would mean the end of Hadza foraging, but surprisingly, they did not. Even today, few Hadza practice any kind of agriculture. Although most adult Hadza have lived in a settlement at some point in time, such experiences have been short-term and have not prevented them from continuing their foraging lifestyle and maintaining much of their traditional culture.

Stasis and Change

Judging from photographs and descriptions, the Hadza visited by Obst in 1911 were remarkably similar to the Hadza I first met in 1995. They lived in the same houses in similar sized camps, used the same tool kit, foraged for the same foods, traded for the same items, and practiced the same sort of religion. In order to evaluate the degree of interaction with outsiders and the amount of change in Hadza culture, Table 1 provides a brief summary of descriptions of the Hadza from the earliest accounts to the present. Italics denote traits that today differ noticeably from what was described in the past. Table 2 lists probable influences from outsiders through time. Table 3 is intended to assess the extent of change over a much longer period and explore the relevance of contemporary foragers as models of the Paleolithic. It provides a list of Hadza possessions with estimated times of appearance either in the general Hadza area, or in the case of the earliest possible artifacts the earliest appearance anywhere.

The impression one gets from reading the historical record, as others have noted (Fosbrooke 1956) is that there is an overwhelming continuity in the descriptions throughout the

20th century. While the population may have grown slightly, camp size, mobility, diet, and mating system are very consistent (Table 1). In 1960, Woodburn (1968) found average camp population to be 18 (1-100). People camped at one spot for no more than a few weeks. In 1980, McDowell (1981) found the average camp population in the Mangola area was 27.7 (22.6 to 31), and camps moved about 17.7 times per year. In 1995-96, the average population of 10 camps for which I had numbers in various areas was 29.1 (10-108). However, I found that camps did not move so frequently. For example, even though people were constantly visiting other camps, there tended to be a camp at one spot for a month or two. Thus, it appeared camps might move only about 6-12 times per year though individuals moved more often than that and there was great variation. For example, the largest camp, which contained 108 people, was located in the spot with the most continuous water. While the composition of this camp changed with families moving in and out seasonally, there was always someone at this spot the year round. Although there were still people there the following year and it appeared to have become a permanent camp, it was abandoned in 1998. There may be a trend toward larger camps staying in one place longer in response to many areas being taken over by non-Hadza. However, large camps (e.g., 100) during berry season in certain areas also existed long ago (Woodburn pers comm).

Just as Bagshawe (1925) and Cooper (1949) found, the Hadza today have no spears (but see Kohl-Larsen 1958) or shields and only a few native-made axes which are used to break open trees to get at honey. As found by all observers, hunting is done only with bow and arrow. As Obst (1912) and Woodburn (1968) found, men today usually hunt alone in the wet season and many days may pass without any big game being killed. As Obst, Bagshawe and Woodburn noted, in the dry season men often hunt in pairs at night around the few permanent waterholes waiting for animals to come to them, which can be dangerous since lions employ the same strategy. As described by Obst and Bagshawe meat is also obtained by scavenging. And as noted by almost all observers, women and children go foraging for tubers, berries and baobab. In contrast to Bagshawe's observation, Hadza today do not eat insects or snakes and I have never seen them eat lizards.

In 1985-86, Hawkes and O'Connell (Blurton Jones et al. ND) found that less than 5% of calorie intake (in one camp) was from agricultural food. In 1995-96 (in 2,733 person-days in 5 camps), I found 9.9% of all calories entering camps came from non-foraged food. Much of this was maize (5%) and millet (4.2%) delivered to one camp by one missionary during 1 month, the rest gained through trade with agro-pastoralist neighbors (Figure 2). Because I calculate the Hadza consume about 30% of their total calories while out foraging (Marlowe in press), what comes into camp is only about 70% of total consumption. This means that agricultural food received from non-Hadza represents only about 6.93% of total consumption (9.9% of 70%). Thus, the amount of food acquired from foraging in 1995-96 was not much less than in 1985-86.

I suspect that 50 or 60 years ago the 9.9% of food entering camp that is agricultural would have instead been from hunting, which would almost double the amount of calories from meat. It is clear that with so many people moving in and cutting down trees and herds eating the grass, the routes of migrating animals between the game parks has been affected. The Hadza say that there is less game than in the past and Obst (1912) reported seeing large herds of big game in Yaeda valley in 1911. Not only were there many elephants (which are fairly rare today) but even rhino, which are now absent. In 1998, the El Nino rains created a new lake in Yaeda valley (which may persist for several years), and I found some Hadza fishing for large catfish by whacking them with their bows (even though the Hadza say that fish are not decent food). Before 1998, however, there were mostly herds of Datoga cows in Yaeda valley with only the occasional herd of antelope.

As Table 1 shows, the Hadza have been trading with their neighbors throughout the 20th century. Just as they did at the time of Obst's visit, Hadza today give meat, skins, and honey in exchange for tobacco, marijuana, maize, millet, clothes, beads, cooking pots, and scrap iron for making their axes and arrowheads. They no longer get clay pots but rather metal pots and they no longer get brass neck rings. Nowadays, the Hadza also receive some beer from their neighbors, sell some crafts to tourists, and receive a variety of goods from researchers, especially clothes and nails for arrowheads.

Considering the Hadza are surrounded by more powerful neighbors, a surprisingly small percentage of Hadza women marry non-Hadza men, perhaps less than 5%, though Kohl-Larsen (1958) says that in the 1930's, Isanzu men frequently stole Hadza wives. Often after a Hadza woman does marry an outsider and has a child, she leaves him and returns to raise the child in a Hadza camp. This may well be because Hadza women are too independent to put up with the sort of treatment they get from non-Hadza men. When they do return, they do not experience any noticeable stigmatism. As described in virtually all, earlier accounts, the Hadza are quite monogamous (serially) with occasional polygyny. There is no marriage ceremony, no arranged marriage, divorce is easy, and the levirate is practiced.

Despite the overwhelming impression of continuity in the historical record, there are a few exceptions and it is these that catch my attention precisely because they stand out in relief. Obst found some Hadza wearing brass neck rings, and making large holes in their earlobes, a practice they acquired from the Isanzu. Today, the Hadza do neither of these, though the Datoga do, even more so than the Isanzu. Obst said the Hadza adopted circumcision from the Isanzu but he saw only one circumcised man and he was an Isanzu living in a Hadza camp. Bagshawe (1925) said old men and women performed circumcision on boys and girls but without any elaborate ritual. Bleek (1931) said, unlike other tribes, circumcision was unknown to the Hadza. Hadza men are not circumcised today and only a certain unknown fraction of women are. Given all these differences, it appears there may have been more influence from Isanzu then than now, at least along the margins of Hadza country.

Another difference between Hadza in the early 1900's and Hadza today is that they are less shy. These days Hadza will approach a visitor, at least a foreign visitor, rather than hide. Their second language is Swahili rather than Isanzu. They use metal rather than clay pots (there is usually at least one in every camp). In addition, many Hadza attend school, even if only for a year or less. I would say that about 20% of Hadza under 50 years old have attended some school and about 60% of those under 30 years old have attended some school. There is less gambling by men nowadays. I have seen Hadza men play their gambling game, lukucuko, only at one camp in one season. According to Woodburn (1970), in the 1960's they often played. My

impression is that there may be less storytelling nowadays than in the past since all men can tell stories (for examples see Bala 1998), but only rarely do I observe them doing so. In some camps, there is now the occasional radio or flashlight (invariably lacking batteries). There are today more factory-made clothes, which researchers give as gifts.

Just in the last four years there have been developments that may well change Hadza life. Even more than the ever-increasing number of Datoga, Iraqw, Isanzu, and Sukuma moving into the area, a threat to the foraging lifestyle is posed by the sudden influx of ethno-tourists. During my year in 1995-96 there was only about one van full of tourists per week visiting Hadza camps during the 3-4 months of tourist season in the Mangola area, where a Swahili village exists. In bush camps there was no tourism except for one company that brought very small groups of tourists once or twice a year. In most bush camps many people, especially women, much preferred gifts to money, since they did not ever go to a village and had no way to spend their money. During the dry season of 1998, there were several caravans of tourists, even at remote camps. The tourists come because they want to see foragers. Tourism may, therefore, keep the Hadza appearing to forage. In reality, at least during the dry season when tourist travel is possible, some Hadza receive enough money from the tourists that they can buy maize to live on, and only forage when the tourists show up and want to go on a walkabout. In one Mangola camp, Hadza have taken to making their traditional clothes of skins because tour guides tell them that is what the tourists want to see. In this respect then, present-day Hadza in Mangola would appear even more like their ancestors a century ago. The only difference is that these new leather clothes have plastic beads sewn on, beads they make from bits of colored plastic they find around the village.

This tourism would not be troubling if the Hadza bought only maize, but after tourists pass through, their neighbors waste no time bringing them alcohol and leaving with all the money. During 1995-96 there was no drinking in remote camps, only in those close to the village in Mangola or the settlement at Mongo wa Mono. During 1998 there was much drinking in virtually all camps. Drinking leads to arguments and fights and injuries. It seems that for a while the Hadza may continue to forage during the wet season when the mud prevents tourists from

coming. But it may not be long before tourism spells an end to foraging year round. It may be that Hadza culture, which has remained little changed despite long contact with more powerful neighbors, will now, with the arrival of tourists, finally succumb to outside influences, largely because the tourists are a source of money. The irony is, of course, that the tourists come because they want to see foragers and once they have completely eliminated real foraging they will no longer come, leaving the Hadza with no source of income.

Despite these changes, in the wet season at least, by and large, I would notice little difference were I to travel back in time to visit a camp in 1900. The continuity extends all the way to their bows and arrows being exactly the same mean length, the height of men and women being the same (Blurton Jones et al. ND), and their favorite colors of beads being blue and white (Kohl-Larsen 1958). Despite the fact that the Hadza have had contact with non-foragers continuously for many decades and perhaps centuries, they have changed little and conserved much.

Why Stasis?

Why did the Hadza change so little in the face of contact? Woodburn (1979; 1988) argued that encapsulation was the result of the immediate-return organization of Hadza culture, which insulated them from the temptations of agriculture and the entanglements of extensive trade and serfdom. I agree. Yet Woodburn offers no explanation for why some, like the Hadza, are immediate-return while others are delayed-return foragers. The following are the best explanations I can offer for Hadza conservatism.

First, the habitat is rather marginal. It is poor for growing crops without irrigation. Second, although it is a good habitat for pastoralism, before a government eradication program in the 1940's and 1950's, the tsetse flies were very bad. This meant that pastoralists did not encroach too much. Thirdly, Tanzania has always been undeveloped. By embracing socialism with independence, development remained slow until recently. This lack of development and lack of infrastructure (e.g., roads) meant less change came to the Hadza area than would have occurred otherwise. Fourth, the presence of Ngorongoro Conservation Area, Serengeti National Park, Maswa Game Preserve, and Lake Manyara National Park, all of which border Hadza

country, allowed wildlife to persist. Protected big game animals migrate through Hadza country allowing them to continue to hunt as well as gather. These game parks owe their existence, in part, to colonialism, since during British rule Serengeti and Ngorongoro were established by forcing the Maasai to move. Fifth, the Hadza have long adopted a low-key response to outsiders. As mentioned, they used to hide from strangers (Bagshawe 1925). This behavior may have helped avoid many confrontations that could have resulted in extermination at the hands of enemies. Even though the tsetse fly may have limited the potential for pastoralism, it also seems likely that, were it not for colonialism, when the Germans halted the Maasai expansion, the Maasai would have pushed the Hadza out of the area after pushing the Datoga out of Ngorongoro Crater.

It is possible that the interest of researchers beginning in the late 1950's and growing up to the present may have prolonged Hadza foraging (for reviews see Ndagala and Waane 1982; McDowell 1982). This might have occurred from the many gifts that researchers are expected to give. This may have made it less likely that some other tribe would subjugate the Hadza. Others also want outsiders to come and provide goods, and they recognize that the outsiders are coming to see or study the Hadza. For example, recently several villages have instituted fees for researchers and tourists just for passing through on their way to see the Hadza. It would hurt these neighbors if outsiders stopped coming because the Hadza were no longer foraging. On the other hand, it may well be research publications that have contributed to the awareness responsible for attracting tourists and hastening the end of foraging.

It certainly doesn't seem that the Hadza remained foragers because they were oppressed by their neighbors and denied access to other means of production, as revisionists might argue. On the contrary, Hadza have often refused to take up agriculture. Unlike some southern African bushmen, Hadza labor has been in little demand by pastoralists. According to some informants, there has occasionally been a Hadza child kidnapped by Datoga and reared as a herder but it seems there would be little interest on the part of Hadza in working for Datoga even if there were any demand for labor. Why did some Bantu pastoralists have a demand for forager labor in southern Africa? Presumably, forager labor was so cheap it afforded an extra bit of leisure for the

Bantu. Perhaps the Hadza remained independent simply because they could make a decent living foraging, in some respects a better living than their neighbors, many of whom eat a monotonous diet of maize only (Blurton Jones et al. 1996). The Hadza don't pass up any hand-outs of maize but they do not seem interested in working for Datoga or Iraqw agropastoralists, who may consequently, find Hadza labor of little value, being so unreliable.

Discussion and Conclusion

Early anthropologists described cultural evolution as a unilineal process of development. Tylor (1871) believed in the psychic unity of all humans and felt that cross-cultural variation resulted from historical processes, not racial differences. Those least developed, like hunter-gatherers, were no different biologically but were, culturally, "living fossils." Morgan (1877) proposed a sequence of stages from hunter-gatherers (savagery) to complex states (civilization). Such a unilineal scheme implies traits within a culture must change together, an extreme form of holism, and suggested some impetus towards complexity, often labeled progress. Such reasoning led some to speculate that foragers would have a primitive language to go along with their primitive technology. This is clearly not the case. In reaction, others argued against the living fossil idea on the grounds that language or other traits may develop, even if technology does not. One could cite many examples to support this particulate view of culture, but it is an overreaction to dismiss completely an evolutionary sequence to cultural and ecological change. After all, all societies were foragers 12,000 years ago, and few have moved directly from foraging to industrial production.

Is the particulate view of culture responsible for the rejection of the living fossil idea among so many today? It seems more likely they reject the idea because living fossils imply backwardness, which they wish to deny. In some ways, a forager culture may have changed greatly without technology changing much and if so, such foragers are only technologically living fossils. But it is also possible that in addition to technology, other cultural traits have changed little. In Tanzania, it is not only the Hadza who have changed little but also their neighbors, the Datoga and Maasai pastoralists. The Maasai and Datoga are strikingly different from the general Tanzanian Swahili population and this difference is due to their strong conservatism. If they had

sent their children to school, and given up their traditional attire they would now blend in. But they did not. In a sense, at least over the past century, they have approximated living fossils and, like the Hadza, appear little different than they did a century ago, even though they have been in contact with others.

Compared to most other ethnic groups in Tanzania, the Hadza, Datoga, and Maasai have been more conservative, more like living fossils than others groups. There is nothing mysterious about conservatism. It creates autonomy as much as it is caused by autonomy. It is wrong to think of foragers as living fossils if aspects of their cultures have changed appreciably. If that is what one wants to argue, one must present evidence of such change. But if one wants to reject the living fossil idea in general, whether there is evidence of such change or not, I suspect it is because one equates conservatism and backwardness with inferiority. That equation is often made in Tanzania, where some people get angry or insulted that someone wants to come study the backward Hadza. They resent what they perceive as a foreign fascination with savages, and the portrayal of Tanzania as backward. Obviously they are right about the fascination with the Hadza, but it is virtually impossible to explain to them why this does not make the Hadza inferior.

Of course time does not stop for foragers who are isolated. It is revealing that my synopsis of Hadza history is a series of encounters with and influences from others. Few would be interested in reading a history that described how 100 years ago, the Hadza foraged for x, y, and z, then 90 years ago, they foraged for x, y, and z, while 80 years ago they foraged for x, y, and z. We tend to think of history as a series of changes, so it is understandable that a group experiencing little change is portrayed as frozen in time. The notion that what one sees when looking at foraging societies is a picture of what Pleistocene humans were like, has rightly been criticized. But just because the same amount of time has passed for all societies, does not mean the same amount of change has occurred. Obviously less change has occurred in the domain of subsistence and also fairly obviously in other domains as well. Even if foragers are not living fossils, surely they are the best living models of what life was like prior to agriculture. The pendulum has swung so far away from the view that contemporary foragers are living fossils that

some people now dismiss them as models of anything like our Pleistocene ancestors, as the statement from Wilmsen quoted above illustrates.

Examining the case of the Hadza affords another perspective on the Kalahari debate. There is no question about whether the Hadza were, or were not, in contact with non-foragers before they were studied; they were. Clearly, they were also often dominated when they were in contact. There is no definitive evidence the Hadza were not enslaved or enserfed by their neighbors in the distant past, but there is no evidence that they were either. Nor is there evidence that they once were pastoralists or farmers. But suppose they were. What difference might that make? If they were secondary foragers we might be misled into thinking that certain traits, their religious beliefs for example, were the product of a foraging lifestyle when in fact, they may have evolved during an agricultural past and only persisted into the forager present through cultural inertia. If one is interested in studying foragers from an evolutionary ecological perspective it might not matter since many aspects of secondary foragers' lives would likely differ little from primary foragers. For example, time budgets, life history traits, and camp demographics should converge on values that are constrained by the foraging lifestyle, rather than cultural inertia.

Certain traits of ethnographic foraging populations may indeed be biased. This could result if only those foragers in marginal habitats survived long enough to be described, or if those societies described are those that survived because they went to extreme lengths to avoid conflict. Pre-agricultural societies may have engaged in much more warfare than those more peaceful societies that were spared precisely because they adopted a policy of hiding from more powerful strangers. In addition, perhaps ethnographic foragers are more egalitarian in response to their more powerful neighbors. Australian societies, who by and large were not in contact with non-foragers, or any state societies until Europeans arrived, were described as gerontocracies, with intense polygyny, and frequent warfare (Hart and Pilling 1979; Spencer and Gillen 1927). It is possible that pre-agricultural populations were more hierarchical, more polygynous, and more often engaged in war than most of the egalitarian foragers in the ethnographic record, but this will not be easy to resolve. The Kalahari debate will have proved worthwhile if it results in a closer

examination of the archeological record to identify pre and post-contact forager traits (e.g., Sadr this volume).

The special place of foragers in anthropology has been challenged by the revisionists on the grounds that contemporary foragers are not primary foragers, or that they have been oppressed by outsiders, or that they are a creation of our need to view others as simple and primitive, as living fossils. But if we are interested in the past, surely foragers are the best models we have if we hope to actually observe and measure behavior. If the revisionists' criticisms lead to more careful scrutiny of those factors that make some contemporary foragers poor models of the past, this would be a valuable contribution of the Kalahari debate. For example, we can look for correlations which could improve our models, a correlation between say habitat and camp size, between diet, post-marital residence and social organization, between variance in food returns, hierarchy, and the mating system. We might discover that warfare is associated more with foragers in rich, wet environments that lead to high population densities, or conversely with foragers who live in such dry environments that waterholes are defended. By using archeological estimates of population density, we might be able to infer what rates of warfare would have been for various Pleistocene populations. By this method we may eventually arrive at an answer to the question of how representative some contemporary foragers like the Ju/'hoansi or the Hadza are of the pre-agricultural past in southern and eastern Africa.

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Table 1. Descriptions of the Hadza through time. (Italics indicate descriptions that differ with my observations of Hadza today)

Year & Source	Pop.	Camps	Subsistence	Family	Trade and Interaction	General
1890's Baumann 1897		Saw houses	Baobab pegs in trees		Neighbors had name for Hadza	*Hadza hiding*.
1911 Obst (1912) 8 weeks German geographer	100	1-3 families 1st camp = 55, 25 were "real Hadza" Weeks, months at same place in dry season	Don't recall herding or farming. Primary diet: tubers, berries, hyrax. Baobab, gazelle, antelope, hartebeest, gnu, ostrich, giraffe. Night hunt in dry season. In wet, follow game many days, can go weeks without a big game kill. Watch vultures, scavenge from lion and leopard. 2 kinds of poison.	Levirate. Can't marry mother, sister, *can niece, granddaughter*. Doting mothers, fathers, 5-10 arrows for daughter if she loves man, polygyny often (2 different huts)	Get tobacco, *brass neck rings from Isanzu* for lion, leopard fur, honey. Sukuma give beads, knives, old hoes. Isanzu captured women, kids till elephants rare.	*Circumcision* from Isanzu, only 1 man. Wars with Iraqw, Isanzu. No afterlife. Only old buried.
1917-23 Bagshawe (1925) several trips over 6 years British colonial district officer	5-600	2-3 men, wives and children	No farming, domestic animals or *dogs*. Meat, honey, fruit, tubers, fish, *snakes, lizards*, carrion birds, eggs, *ants, insects*, all but hyena. *Kill elephant, scavenge rhino*. Had not tasted beef. Seldom lose wounded prey. Kill lions, match by day but eaten by lions when night hunting without fire. *Reed fish trap.* Running noose snare, no nets.	Brideprice 5-15 arrows. Easy divorce. During 1918-20 famine, some Hadza men married Isanzu women.	Get old spears as scrap iron, beads, tobacco for skins, honey, meat to neighbors on border. Attacked and killed by Datoga who claimed goats were stolen.	No spears or shields, one axe. Often hungry but happy. No religion, burial, magic, medicine or musical instrument. Cannabis.
1930 Bleek (1931) 6 weeks Linguist		2-3 families of relations but one may move off by itself Few weeks or months before moving	No domestic animals or gardens. Roots, bulbs roasted in ashes, fruit, meat cooked on sticks or boiled, liver eaten raw. Seeds pounded then boiled. Giraffe, ostrich preferred meat. Honey is favorite dish, a treat for kids. Water only beverage. Get some meal from Isanzu. Hammer scrap into arrowhead with iron mallet.	*Most own 2 wives* in different camps but show children great affection. Girls marry at 16, boys bit later, no ceremony, brideprice: beads to father. Take to groom's home	Get tobacco, meal from Isanzu, iron scrap from Bantu, *paper ear ornaments*, *clay pots*, calabashes, beads, *copper rings*, stuffs for meat, skins, honey, beeswax (sell at a store).	Remember Maasai raids and famines. Dance in circle. Copper arm bands, both sexes wore beads. Medicinal scars. Lukucuko. Burial. No afterlife.
1931-38 Kohl-Larsen (1958) Many months Doctor, explorer	450 East, 100 West	From 1 extended family may grow to 60-80 in one camp	In photos -- berries, baobab, tubers, klipspringer, ostrich, killed *rhino, hippos.* Native axe. Keep dogs.	Monogamy. Men kill adulterer and beat wife. Wife may leave husband if not good hunter, children stay with father.	Get beads maize, hemp, iron for furs, horns to Isanzu. Brass bracelets, some cloth. For tobacco, women take Isanzu lover	Girl's fringed apron, tattoos, dancing, epeme items, firedrill. *Spear for hippos.*
1945-47 Cooper (1949) 10 days twice British colonial game ranger		5-12 huts, some camps > 35, 2-3 men, wives, kids, grand-parents. 7-10 days at one spot before deplete baobab.	Baobab main food 5 months. Roots, fruits. Follow honey-guide bird, smoke to stun bees and get honey. *Rhino*, buffalo, giraffe, wildebeest, hartebeest, zebra, impala, kudu, roan, birds, squirrel, tortoise, *some lizards*, hyenas when hard-pressed but not snakes, frogs, toads. 2-3 men may drive game.	Marriage after short engagement, brideprice few beads, monogamy the rule.	Get iron, millet for meat, skins but he stopped it. No punishment but ban on rhino hunting to sell horn. Love elephant he shot. *Few clay pots.*	No spears or shields, few native-made axes. One short camp stay: 2 impala, 2 warthog, 1 porcupine, 1 large bird.
1950	Few	No fixed abode,	No herding or cultivation, roots, game,		Get cloth, *clay pots*,	Few make

Fosbrooke (1956)	hundred, < 1000	small groups move in relation to food.	fruits, baobab, smoke native intoxicant plant.		gourds. Would not take money so he gave cloth and beads.	occasional visit to shop in outlying area
1958-present Woodburn (58, 62, 68a, 68b, Barnicot et al. 72) Many trips 58 to present	750 (250 in West, 500 in East) 400 full-time foragers	18 (1-100) Large camps at water in dry, small, dispersed in wet. Few weeks in one spot, shorter than food dictates.	By weight, ~ 80% from vegetable matter, ~ 20% from meat and honey (but account for more calories than that). Berries, baobab, tubers. Usually hunt alone, lion, leopard, serval, wild cat, hyena, vulture, zebra, guinea fowl, jackal, impala, eland, giraffe, hyrax, (some of which is traded). Don't eat civet, monitor lizard, snake, terrapin.	Bilateral descent, Men marry in early 20's. ~60% marriages uxorilocal, few polygynous marriages, divorce rate = 49/1000 years. Kids live with mother after divorce.	Some intermarriage. Proportions of Hadza ancestry = 79.8% Hadza, 17.3% Isanzu, 1.7% Sukuma, 1.2% Iramba (including grandparents, n = 437).	Lukucuko. Musical bow. Attribute disease to violation of epeme meat rules. No territoriality, fluid camp composition. Good health.
1961-64 Tomita (1966)	80 in Mangola	6-11	Hunt alone or in pairs. Berries, tubers, honey, baobab, catch eels and such fish in Eyasi by hand. Hunt impala, zebra, baboon, wart-hog, eland, guinea fowl, francolin, but not snakes, lizard, buzzard, and hyena.	Eland fat as brideprice.	Get corn for baobab. Aluminum pot.	Eland fat used in ceremonies. Small game to family, but larger than impala shared with all.
1980-81 McDowell (1981a,b) Mangola area	800-1000 Mangola = 165 (6 camps)	27.7 (22.6-31) Average distance between camps = 3 km 17.7 moves per year	8 roots, tamarind, baobab, fig, dates, 10 berries. Mostly small game but in calories, large game. Meat eaten 64% of days, honey 21 % of days. Daily meat = .82 kg./person. Agricultural foods (maize, beans, sweet potato, especially in the late dry season).	All Hadza considered kin. Hadza women marry outsiders in outlying areas, men can't.	Witchcraft fears of neighbors in villages. Only ethnic group in Tanzania to escape tax shows autonomy.	Good diet and health relative to neighbors. Non-territorial, egalitarian.
1982-present Blurton Jones, Hawkes, O'Connell. (1992) Many trips	1000 (250 west, 750 E) density = .24/km^2, growth rate = 1.35/year	16.5 (2-48 in 36 bush camps)	Tubers, honey, meat, baobab, berries. Encounter hunt by day, intercept by night. Target large game and took one/29 hunter-days (4.9 kg/hunter-day). 5 year olds forage at rate capable of meeting half their needs. 5% of calorie intake was agricultural foods.	Divorce rate = 60/1000 years. TFR = 6.2. Infant mortality = 21%, juvenile = 47%. Life expectancy at birth = 32.5, women at 45=21.3	Some get maize for guarding fields, sweet potatoes for harvesting. Iron, cloth for honey. Cloth, nails, beads from researchers.	Frequent name changes. Epeme dance when no moon, Sun is god. Lobby researchers, negotiate gifts.
1995-96 - present Marlowe (1999a, 1999b, in press) 17 months.	300 full-time foragers in east	29.1 (10-108 in 10 bush camps) 2 weeks to ~ once per month or 2 but 1 camp year round	Food brought into camp in order of importance: tubers, berries, honey, baobab, meat (large, medium, small game, birds) see Fig.2 for %. No insects, snakes, or lizards. Fish killed by whacking with bows in new Yaeda Lake in 1998. In trade or gifts: maize, millet (see Figure 2 for %). Hunt in pairs at night in dry season. Hunt alone, occasionally in pairs. Take any bird or mammal, considerable scrounging. Women forage in groups of 3-8.	3% of full-time forager men (6% women) polygynously married. 1/3 young children are stepchildren, who receive less direct care. Men gave less care in camps with more fertile women. Total fertility = 6.1.	Get maize, millet, cow from Datoga, Iraqw, (iron from Isanzu) for meat, honey. Get clothes, matches, beads, nails from researchers. Money from tourists for crafts, singing, walkabout. Maize, millet from missionaries. When gathering, some women scared of Datoga men.	Epeme dance when no moon, girl's puberty ritual when berries ripen. More items more often shared in smaller camps. Scars on cheeks. Lobby researchers, negotiate gifts.

Table 2. Influences from "Others".

Trait or Interaction	The "Others"	Source
Probably interacted with farmers on border	Engaruka complex at Endamagha (Iraqw) 1700 AD	Sutton 1986
Trade for iron, tobacco, beads	Isanzu, Sukuma	Obst 1912
Captured (maybe slave trade), ivory trade	Isanzu 1800's	Obst 1912
Warfare	Maasai 1900	Obst 1912
Maasai expansion halted	Germans 1890's	Obst 1912
Metal ear ornaments	Isanzu	Obst 1912
Brass neck ring	Isanzu	Obst 1912 , Bagshawe 1925 , Bleek 1931
Second language is Isanzu	Isanzu	Obst 1912, Bagshawe 1925, Bleek 1931
Killed for "stealing goats"	Datoga	Bagshawe 1925
Inter-marriage	Isanzu	Bagshawe 1925
Male Circumcision	Isanzu	Obst 1912, Bleek 1931 says none
Female circumcision	Isanzu or Datoga	Woodburn 1964
Trade for clay pots	Isanzu?	Bleek 1931, Cooper 1949, Fosbrooke 1956
Trade for cloth	Isanzu	Kohl-Larsen 1958
Studied	Europeans	Kohl-Larsen 1958
First settlement attempt	British 1939	McDowell 1981
Loss of range to Mangola village	Mangola European farmers 1950	Woodburn 1962
Loss of Mangola	Swahili farmers 1960	Woodburn 1962
Yaeda settlement	Tanzania government (Iraqw)	Woodburn 1968
Second language is Swahili	All neighbors	Woodburn, pers com
Aluminum pots	Swahilis in Mangola	Tomita 1966
Sex to remove death pollution	Iraqwi widows seek out Hadza	Matthiessen 1972
Zeze (musical bow) mbira	Isanzu	Marlowe
Guard fields	Iraqw	Blurton Jones et al 1992 , Marlowe
Use of father's last name	Isanzu, Datoga, Iraqw, Swahili officials, missionaries	Blurton Jones, pers com, Marlowe
Get beer	Isanzu, Datoga, Swahilis	Marlowe
Wells dug near waterholes	Datoga	Marlowe
Lion kill celebration	Datoga	Marlowe
Observed, get money	International tourists	Marlowe

Table 3. Hadza Possessions and Artifacts. * likely made earlier but of different material; + exist now but often made of different material.

Possessions And Artifacts	Earliest possible date	Earliest citation	Pre-Neolithic	Post-Neolithic	Freq. Change 20th Century
Pounding rock	> 3 mya		X		-
Anvil for pounding	> 3 mya		X		-
Dig stick	> 3 mya	1911	X		-
Firedrill	> 300,000	1930	X		<
Hearth	> 300,000	1890's	X		-
House		1890's	X		-
Skin shoes + (now tires)			X		<
Skin belt +		1930	X		<
Leather skirt +		1911	X		<
Leather kaross +		1930	X		<
Leather bags			X		-
Leather sheath		1930	X		-
Sleeping hide			X		-
Gourd container, dipper		1930	X		-
Organic jewelry		1911	X		<
Grass basket			X		?
Bow	10-35,000	1911	X		-
Arrow (6 types)	10-35,000	1911	X		-
2 Poisons		1911	?		-
Shell (mixing poison)			X		-
Quiver		1931-38	X		-
Fertility walking stick			X		?
Medicine horn		1931	X		-
Wood toys		1960	X		?
Wood gambling chips		1930	X		<
Pegs for climbing		1890's	X		-
Stone pipe		1911	X		-
Wooden pipe		1930	X		?
Epeme items: feather or fur headgear, maraca, cape		1931-38	X		-
Twine noose snare		1917	X		?
Glass bead jewelry	1300 AD	1911		X	>
Epeme items: metal leg bands & bells	1500 AD	1931-38		X	>
Iron arrow point *	1500 AD	1911		X	-
Metal knife *	1500 AD	1925		X	>
Metal axe *	1500 AD	1925		X	>
Metal Hammer *	1500 AD	1930		X	>
Metal Chisel *	1500 AD			X	>
Metal Needles *	1500 AD			X	>
Musical bow with wire	1500 AD	1960		X	>
Tobacco *	1550 AD	1911		X	>
Metal cooking pot * Previously Clay pots	1500 AD 1300 AD	1945 1930, 45, 50		X X	> <
Factory cloth	1800 AD	1911		X	>
Cloth dolls *	1800 AD			X	>
Plastic beads	1990 AD	1990's		X	>

Figure 1. Map of Hadza area.

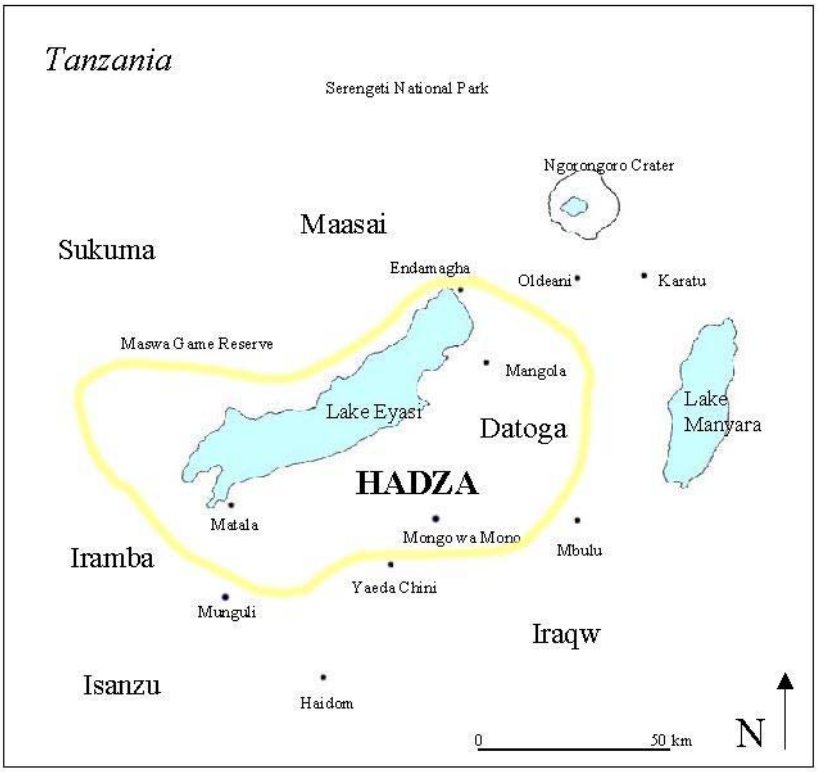

Figure 2. Hadza diet showing daily Kilocalories brought into camp by type of food. Data collected over a 9 month period in 5 different camps in 1995-96 (2,733 person-days). All categories are foraged wild foods except "Daily Non-wild Kcals," which is mostly maize (5%) and millet (4.2%) gained as gifts from a missionary, or in trade with neighboring agro-pastoralists. This 9.9% of food entering camp equals about 6.93% of total diet, since about 30% of the diet is consumed while out foraging.