SI 3.10. The neighbors and the nation.

Farmers
1. iraqw
2. isanzu isanzu
3. iramba
4. sukuma

Herders
5. datoga
6. maasai

Foragers and ex-foragers
7. Sandawe sandawe
8. Dorobo dorobo

9. Raiding and warfare, past and present. raiding

Neighbors and their population histories.

The Hadza are the "type specimen" for Woodburn's (1988) classification of "encapsulated" foragers. They are surrounded. They have no where to go outside what they claim as their traditional home. There is little to no opportunity for a hunting and gathering economy to exist in the neighbors' countryside.Throughout the 20th century Hadza country has been surrounded by neighbors, representatives of three major language families: To the east and south-east, especially in the highlands, are the centers of population of the Cushitic speaking WaIraqw, the majority in Karatu and Mbulu districts. Bantu speaking Isanzu and Iramba farm and herd in the country to the south and south-west. The most populous neighbors of Western Hadza are the Bantu speaking Wasukuma, owners of large herds, and successful cotton growers. The Nilotic speaking Maasai have been formidable neighbors in the past and today adjoin Hadza country in the north at Endulen and in the west near the Maswa game reserve. In addition to the encapsulating farmer neighbors, Nilotic speaking Datoga pastoralists live everywhere in Hadza country and in several other locations in northern Tanzania. All the neighbor populations are much larger than Hadza, and their country encloses administrative centers, main roads, and tourist attractions. Some information is available about the recent history of these neighbors, and on their historical relationships with the Hadza. Their relationships with each other is a more complex topic (see for example Rekdal 1999). Rekdal (2007) has compiled an important bibliography of the Mbulu area which includes sources on all the ethnic groups of this area.

Each neighboring group deserves description, especially as they are probably each undergoing, at their different paces, the transitions between traditional and modern described for the Iraqw by Snyder (1996, 2005) and for Maasai by Homewood (2009)

and others. But I will concentrate on information about their populations, for two reasons. 1) Most are increasing rapidly, and put pressure on Hadza country. 2) perhaps Hadza population and its history is entrained to that of the neighbors or the nation (Hammel & Howell 1987). Alternatively, Hadza population may have during most of the 20th century followed its own trajectory after narrowly escaping extinction sometime around the end of the 19th century.
The collaboration between linguists and historical geneticists in Tishkoff et al (2009) gives us information relevant to the remote ancestry of each of the neighbor groups which I will briefly cite for each population.

Iraqw.

Nowadays the majority population of Mbulu and Karatu districts, the Iraqw have been studied by several anthropologists, among them Winter & Molyneaux (1963), Thornton (1980), Snyder (1996, 2005), Rekdal (1996, 1999, 2007), Rekdal & Blystad (1999), and Lawi 1999, 2000, Borjesen 2004, Butovskaya 2012, 2013) and they form the majority of patients in medical reports from Haydom Hospital (e.g. Olsen et al. 2000, 2002, 2008, Hinderaker et al. 2003). They are by tradition mixed farmers in the highlands around Mbulu, famed for their intensive traditional agriculture in the Mama Issara heartland. Many are also now employed and employers in Mbulu and Karatu and elsewhere. Electricity came to these two towns in 2000. Each has piped water in some locations.

Historical linguists show the clear membership of Iraqw in the southern Cushitic languages, which also include several much smaller populations scattered between northern Tanzania and northern Kenya. The southern Cushitic language ultimately links the Iraqw to more northerly populations in Ethiopia. The linguists and genetic historians of east Africa seem to suggest that southern Cushitic speakers (ancestors of Iraqw, Gorowa, Burunge, and Mbugu) have lived in northern Tanzania for more than 4000 years (see for example Tishkoff et al 2009 supplementary material). They may have been the first non- click – speaking population to arrive in the country.

Iraqw oral history indicates that some 10 generations before Fosbrooke's 1955 interviews, Iraqw moved from further south into the highland area east of Mbulu, an area enclosed by mountains and safer from cattle raiders. Fosbrooke, and Lawi (2000) date the move at early in the 18th century. The most frequent raiders were said to be Datoga (Barabaig). Iraqw were important neighbors of Hadza around Siponga in Woodburn's day and took over Siponga by the end of the 1970s. They are probably now the major influence over eastern Hadza, replacing the dominant influence of Isanzu described by Obst early in 20th century.

Impressed by the intensive farming in the Iraqw homeland, after WW2 the British administration encouraged WaIraqw to expand from their quite small enclave in Mama Issara into the well watered highlands around Karatu, and east to the top of the rift wall above Mto wa Mbu. The area had been used by Maasai and Datoga but after the

Rinderpest epidemic the German and British administrations seem to have kept Maasai out of this area and encouraged both white settlers, and WaIraqw to move into the area and farm. After independence some of the large farms and coffee plantations were taken over by Iraqw. Some German farmers remain, and one British owned farm and hotel. The Maasai were thus deprived of what was probably a productive dry season grazing refuge. The Iraqw were given valuable land into which to expand.

The 1995 Tanzania National Census shows a population of 348,117 in Mbulu district with 3.4% incr pa. (Chapter 10, Tables 10.1 and 10.2). The great majority in Mbulu district (as defined at that time) were Iraqw speakers. Datoga probably form the largest minority. The district population in 1995 thus well exceeded Winter & Molyneaux's (1963) predicted 288,000 in 1990.

Winter & Molyneaux (1963) describe the earlier history of population increase among WaIraqw. They report that between the 1948 and 1957 national censuses, Iraqw had been increasing at an annual rate of 2.44%. Winter & Molyneaux (1963) extrapolate backward from the 1948 figures to a population of 26,000 for the year 1890. Citing the early German visitors Werther in 1892-93 and Jaeger in 1906, Winter & Molyneaux (1963) claim historical support for their estimate. They argue that the estimates by the German visitors (17000 in Kaynam and 5000 to the south) imply that in the late 19th century Iraqw were still primarily confined to the Kaynam area and numbered in total about 22,000. They suggest that the increase has been possible because of the opportunity to expand into areas in the highlands suitable for their mixed agriculture.

There are obvious parallels between their claims about Iraqw population history and mine about Hadza history. In both cases we extrapolate back to a supposedly small population in the late 19th century, followed by 50-100 years of constant, and quite rapid increase (2.44% Iraqw, 1.5% Hadza). Our accounts differ in several respects. I imply increased density among the Hadza, who cannot have expanded, Winter & Molyneaux (1963) show expansion among the Iraqw. These authors do not question the small and local 1890 population of Iraqw, while I attribute the small Hadza population to Bantu and Maasai expansions. But Iraqw may have been subjected to some of the same factors. Rinderpest would have afflicted the Iraqw herds as much as the Maasai and Sukuma herds, although Borjeson (2004) offers persuasive evidence that they were not greatly affected at the time of Baumann's visit when Maasai were severely afflicted. Iraqw oral histories talk of migration from the south to their mountainous enclave to escape cattle raids and hostilities. Their raiders may have been pacified by Rinderpest and the Germans just as the Hadza persecutors were. The relatively peaceful later movements of Iraqw and Datoga (Gisamajeng and Barabaig) discussed by Rekdal and other more recent authors may not have been feasible in the pre-colonial era.

Isanzu.

Maho & Sands (2002) include Isanzu as a dialect of Nyilamba (the language of the Iramba). Hadza informants have differentiated between Isanzu and Iramba as

peoples, describing Hadza contacts with Isanzu as far back as Obst's time. The relationships between the Isanzu and Iramba people seemed unclear to me in the field, and to some of my Hadza informants. Isanzu speakers form the majority in areas immediately to the south-west of the eastern Hadza. I have found very little economic or demographic literature on Isanzu (valuable information could exist in the Virginia Adam collection at the London School of Economics Library) but they are a large and modernizing population of very successful mixed farmers. They appear in research on status of rain-makers, and gender rituals (e.g. Sanders 2000, fieldwork in 1993-95, 1999, 2001). Sanders (2003) says that Isanzu oral histories unanimously claim their origin on Ukerewe Island in Lake Victoria. Like Snyder on WaIraqw, Sanders concentrates his attention on how rural people are accomodating to modernity while attempting to retain their identity. While Hadza seem to outwardly reject "modernity", their neighbors struggle to make an effective accommodation between the new and the known. That "modernity" has been offered in a purely farmer-centered form may have much to do with this difference between Hadza and their neighbors.

Isanzu influence on Hadza seems to have waned. In the early 1900s Obst (1912) described Isanzu as the "Kultur-zentrum" for the Hadza, and commented on the presence of Isanzu families in a Hadza camp near Yaeda. Bagshawe (1924) reported Isanzu girls marrying Hadza men to escape a famine.

In the 1970s Isanzu influence was substantial at the Hadza settlement founded in 1965 at Munguli. Isanzu joined the village in increasing numbers until in 1990s it was virtually abandoned by Hadza. Many Hadza at Munguli married Isanzu (see chapter 6). In 1985 Lars Smith and I found Hadza in the village but two substantial bush camps not far away. Comparing Obst's account of his journey from Mkalama to Yaeda, reports by Hadza informants, and our observations, it is obvious that Isanzu farmers have expanded their range northward into what was once country occupied only by Hadza. Isanzu are still a component of the population of Yaeda and Mangola. They have occupied the area where Bleek worked, and thereby occupy (along with Iramba) the route between eastern and western Hadza. In the final years of my study the heaviest influence of Isanzu appeared to be poaching. Vehicle tracks circling around on open grassland mostly came and went from the south! The effect of poaching on wildlife can be severe and rapid (see for example Sinclair & Arcese 1995).

The population of Mwangeza ward, a ward in Isanzu country close to traditional Hadza country had a censused population of 2445 people in 1978. It had climbed to 12414 by 2002, an annual rate of increase of 2.9%, close to the national figure.

Iramba.

Iramba Bantu speakers are concentrated in the area west of the Isanzu and south of the western Hadza. Kohl-Larsen's informants, and a Datoga herd owner who I

occasionally visited, and my Hadza informants differentiated between Isanzu and Iramba peoples.

Eastern Bantu (Niger-Kordofanian) speakers settled in the Victoria and Lake Tanganyika basins about 3000 ya and expanded from a core area west of Lake Victoria about 2000 ya. Iliffe suggests that a first wave of Bantu farmers moved rapidly across Tanzania settling only at the most favorable locations (good water) and only later did people fill in the less desirable areas, while dense populations developed in the well watered locations.

Two written versions of Iramba oral history are easily accessible. Danielson (1961) reports interviews with several Iramba elders collected by Daudi Kidamala in 1935 and translated by Danielson. The second account is a brief piece on the web by Dr Jeremiah Kitundu dated April 25, 2005. Patrick Pender-Cudlip (1974) studied Iramba oral history in the 1970s but I could find no accessible general account of his findings.

The accounts differ in some aspects of Iramba and Isanzu origins and migrations. Danielson begins "The Waniramba came from eastern Tanzania. … The old men say: "We came from Pare…"". He then describes a circuitous route going south, then west, and finally north into present day Iramba. Kitundu describes the same circular route from Pare to Iramba. But he also describes their journeys as having begun near Lake Victoria, one group following a fairly direct route to Iramba, the other moving through the Karatu area and on to Pare. After listing some nine clans that apparently followed the circle route Danielson (1961: 68) lists three clans of whom he says "The following are the names of the people, who came to Iramba to settle but did not follow the Waniramba clans in their journey." The single sentence on each of the three clans includes the phrase "came from the west". Danielson and Kidamala's informants may not have differed so strongly from Kitundu.

Many locations are mentioned by Danielson's informants and most lie in the Meatu area, some further east where Isanzu are dominant today, some in the present day areas south and west of Hadza country. Numerous battles are described, many between clans of Iramba, some against Maasai and Datoga. I counted 50 instances of "war", "driven out", or "raids" in Danielson. Danielson's account includes a comment by an informant that "The Wanisanzu moved to Myadu, Mwagala and to the land of the Wakindiga because they were defeated by the Anankali in warfare." The 1935 informant clearly recognizes the presence of Tindiga (Hadza) somewhere near the south-west end of their 20th century range. In chapter 3 I described Danielson's informants story about 2 men who regularly traded with Hadza (Tindiga), apparently sometime late in the 19th century. This is probably our oldest piece of written or oral evidence that the neighbors knew of the Hadza, and encountered them in the same rough general area as they live today. I elsewhere mentioned that, as shown by Dempwolff (1916), several neighboring tribes had their own name for the Hadza, another indication that they occupied their current general area at least back into the mid 19th century. Johnson (1923) introducing his "Notes on Kiniramba" lists their neighbors including "The North is practically uninhabited for a considerable stretch excepting for a small bush tribe, the Kindiga, who

wander about the country round Lake Eyasi and in the Yaida Valley." Johnson sets the population of Iramba in 1923 as 115,000.

Sukuma.

Sukuma are populous and successful Bantu speakers most of whom live between Lake Victoria and Lake Eyasi (Malcolm 1953, Abrahams 1967). They are noted for cotton farming and successful cattle raising. Their enormous herds of cattle are from time to time walked, heavily guarded, through the Eyasi basin to market in Arusha. These droves are a major spectacle in Eyasi life. Given their distribution between the two Lakes one might suppose Sukuma were among the most successful Bantu speaking societies to expand south and east from Lake Victoria. Early European explorers describe complex stratified societies from the Lake region in mid to late 19th century. The ethnographic literature on WaSukuma attends mostly to two features of their society: their legal system (Cory 1954), and their "people's traditional defence force", often referred to as Sungusungu (Abrahams 1987, Bukurura 1996), apparently a recent and spontaneous reaction to problems of law and order in the countryside (see also Ndagala 1991).

Sukuma country adjoins Serengeti (most of which is unlikely to have been very productive for cultivation at any time). Sinclair (1979) describes severe effects of Rinderpest and Smallpox on Sukuma at the end of the 19th century. Sukuma used to run caravans to Lake Eyasi to collect salt (Senior (1957). Sukuma have gradually taken over most of traditional western Hadza country. Between Sukuma cotton farmers and a large and successful foreign owned hunting company, the western Hadza have been almost entirely confined to a small area, from which they were forbidden to hunt.

Sukuma, like many in the area used to suffer from cattle raids but seem to have been much more robust and effective than many in their resistance. They remain among the more innovative and influential language groups in Tanzania. An early bibliography was published by Roth (1961).

Datoga.

Datoga are a population of herders who live in all parts of the Eyasi basin but, in contrast to Hadza, tend to reside more often in the plains than the hills. They have for some time used the Kidelu mountains as a dry season grazing refuge, for a relatively brief part of the dry season. Toward the end of my field work it seemed that more Datoga families were living permanently in the hills. Hadza camps and Datoga bomas are interspersed in the flatter parts of Mangola and Siponga regions. Today they are the neighbors most often encountered by Hadza in Tliika and Siponga.

Datoga in the Eyasi basin were studied during the late 1980s and early 1990s by Monique Borgerhoff Mulder and her students Dan Sellen and Daniella Sieff. Sellen

concentrated on Datoga children's growth, nutrition and weaning. Sieff (1995, 1997) concentrated on Datoga women's work. She showed that the Eyasi lakeshore plain provides at best a difficult livelihood for Datoga, which in turn accounts for their increasing use and burning in the hills used by the Hadza. Recently Butovskaya (2012, 2013) has studied several aspects of aggression and marital life among Datoga.

Datoga speak a Nilotic (Nilo-Saharan) language. related to Kipsigis, Kalenjin, and Nandi, sometimes referred to as southern Nilotic. Ancestors of speakers of these languages are suggested to have arrived in northern Tanzania about 2900-2400 kya (references in Tishkoff et al. 2009 SI). Datoga are thought to have lived largely in the Ngorongoro highlands, the crater, and Serengeti in recent centuries. Tomikawa's oral histories put them in these areas as far back as the late 17th century. But even their recent history appears complicated, and their period (or periods) of occupation of the Eyasi basin quite unclear. Borgerhoff-Mulder et al (1989) describe them as having lived in the Ngorongoro crater highlands and Serengeti in the 18th and early 19th century. They were displaced from this area by the Maasai expansion, in a series of battles in Ngorongoro crater between 1836 and 1851 (Borgerhoff Mulder et al. 1989) which led to the Datoga leaving the crater and dispersing widely around Tanzania. The majority are said to have moved south to the Hanang area, where the large "emojiga"(a Datoga category which Tomikawa describes as a local sub-tribe) known as Barabaig have been extensively described by Klima (1970) and Lane (1996). The adventures of one group are described both in Datoga and Iramba oral history. Locally, Datoga moved from Serengeti not only to the highlands around Karatu but also to the western edge of the Mbulu highlands that enclose the Eyasi basin. Only the Tsetse fly could have kept them from at least using the basin during the wet season.

There may be three separate periods during which Datoga increased their presence in the Eyasi Basin. They may have had limited presence in the basin, perhaps just the occasional raid, before their expulsion from the crater.

First, Datoga (often referred to in Tanzania as "Mangati", Maasai for enemy) may have passed through the Eyasi area during their flight from the Maasai. Kohl-Larsen's (1958 translation page 46) wrote "From the narrations by Schungwitscha [Sigwadzi] emerges that the main Tindiga enemies, in old times, were the Masai and Mangati. He told me about it on June 20th, 1938.
" In ancient times, when our grandfathers and grandmothers lived, they had enemies. The first enemies were the Mangati. It was during the night that the Mangati came. They surrounded us when we were celebrating the Epeme feast. The Mangati waited until we lay down to sleep. Then they broke out of the bush. Many of us were killed by their spears." A truce was made. "Us Hadzapi who were born last, have never heard again that a war or quarrel happened between the Mangati and us Hadzapi." Sigwadzi was aged in his early 40s in 1938, when he already had 3 children. Suppose the midpoint of his parents' ages was 30, and his grandparents bore his parents in their early 30s. Then Sigwadzi was born around 1895, then his parents were born around 1865, and his grandparents in 1835. This is surprisingly close to the period when Datoga were expelled from the crater.

Oral histories imply that one Datoga "emojiga" may have moved directly to the Eyasi area after the expulsion from Ngorongoro. In 1990 our Hadza field assistant Gudo Mahiya told us of a Datoga clan who lost all their cattle in wars with the Maasai, lived as hunters and gatherers until they regained their cattle, and are present in the Eyasi basin today. Dan Sellen, who was with us at the time had heard exactly the same story and clan name from Datoga. Obst gives an account of what seem to us to be the same events but he names the "Wahi", which is Kisukuma for Hadza. Given his confusion about tribal names in general, we prefer the oral history. But Obst's account would place the Datoga in the Eyasi basin before 1900.

Bagshawe first says that "the Kangeju [Hadza] had the country to themselves". But later in his paper he comments (p.117fn2) "Many years ago a large number of Kisamjeng Tatoga, under Saigile, took refuge from the Masai on the borders of Eyasi. They died in hundreds of dysentery." He also reports a story in which Datoga killed some Hadza who had obtained goats by trade, and talks of deaths from feuds between Hadza and "Dorroggo". So it seems likely that at least some Datoga were in the Eyasi area by the turn of the century, and perhaps since their expulsion from Ngorongoro by Maasai in the early 1840s. But subsequent accounts, including Bleek (1931) and Kohl-Larsen (1930s fieldwork) give no explicit description of them as occupants of this area. It is difficult to believe that such conspicuous and impressive people could go unnoticed, nor that so much grass could have gone un-exploited for so long although the area was very heavily infested with Tsetse flies until quite recently. But these are very localized, and Datoga until the last 3 or 4 years avoided Tsetse habitat while successfully exploiting other areas. Obst describes Yaeda plain as occupied by numerous game animals and makes no mention of cattle anywhere.

There is some agreement in the literature about a movement into the basin in the 1940s (Tomikawa 1970, Kohl-Larsen 1958 preface). Accounts by McDowell, Tomikawa, and others, summarized in Sieff (1995) imply that the Eyasi basin has been an area into which Datoga have come since the 1940s as a refuge from various interruptions of their life in highland regions, such as the Canadian Wheat Scheme to the east. Tomikawa p 31 "It was in 1940 that the Datoga in Ghurs and Basodowesh started migrating to Mangola area. As mentioned before, this area had been the territory of Daragwajega which is an old emojiga of the Datoga. But in 1930s Mangola was used as the grazing area during the dry season by the Maasai." Our Hadza informants, responding to Kohl-Larsen's photographs said that in the 1930s Hadza women used to try to dress like Maasai to avoid harassment.

In the 1940s "The people who migrated in Mangola in this period were not only the Datoga. The Iraqw and agricultural Bantu also moved in. It was the agricultural Bantu that started migrating to Mangola which had been inhabited by only the Maasai and the Hadzapi. After the withdrawal of the Maasai, Mangola today forms a very complicated community in which Bantu, Datoga, Iraqw and Hadzapi live side by side." Tomikawa (1970:15). Tomikawa reports that some Barabaig moved into the Yaeda area during the 1960s. Tomikawa's field work was between Feb 1962 and April 1964.

A third influx occurred in 1985 in response to raids on Datoga cattle in Sukumaland which Ndagala describes as having been commercially organized in response to increases in the price of cattle in Kenya at that time. The availability of modern weapons after the Tanzanian invasion of Uganda that displaced the regime of Idi Amin may also have played some role in these events. When Lars Smith and I traveled around Hadza country in June 1985 we saw several burned Datoga bomas. Hadza told us that some time before our visit some young Datoga killed some "Swahili" bird catchers. The army was sent in and many Datoga bomas were burned and doubtless some livestock lost. Ndagala's version seems more plausible, although it would be surprising if it had extended so far east of the lake.

Thus an important uncertainty in our knowledge of the condition of "Hadza country" in the early part of the 20th century concerns the presence, absence or abundance of Datoga herders in the Eyasi basin.

Datoga relations with Hadza

Like many pastoralists, Datoga have some warlike traditions. Even during our study we heard talk of cattle raiding between Datoga and Maasai north west of the lake. The Datoga have a tradition by which a man who kills "an enemy of the people" (Lion or human cattle raider) receives all manner of goodies from his neighbors (Borgerhoff Mulder, Sellen pers comm, Blystad 2003). On occasion this has involved killing a Hadza. We have one record of a death of a Hadza man who killed a cow. But we have heard tales of a handful more, and Fosbrooke has mentioned the occasional retaliation. Hadza do usually treat Datoga with some suspicion. Datoga have been known to steal children to work as herd boys and Hadza parents use Datoga as "bogeymen" to frighten children into not going too far from camp.

We heard of one more recent violent episode, I absolutely cannot vouch for the accuracy of what we were told. When some young Datoga got into a dispute with a stall holder at a rural market they were told to leave. But having reclaimed their weapons at the gate began firing arrows back into the crowd. The police were inaccessible, the National Guard fled, and someone sent for a Hadza. He apparently did not hesitate to use his arrows and the remaining Datoga youths quickly left. Blystad (2003) discusses some other recent incidents, far from Hadza country, in which Barabaig have killed non-Barabaig.

While Bagshawe wrote of Hadza being killed for having acquired some goats, I came across a Hadza man who had about 5 goats in a $2m^2$ enclosure and said they had been lost and he was "keeping then for Datoga – they will pay". I do not know if they paid but I do know that he survived. Hadza also sometimes work for Datoga and seasonally trade honey with them. Hadza often talk resentfully of the way Datoga have modified some of the important water holes in ways that make them inaccessible to wild

animals (and lower the water table). But most of the time, and almost all the time during our study, relations between Hadza and Datoga seem to be predominantly peaceful.

Conceivable effects of the presence of Datoga could include the strong tendency for women to forage in groups, and the exhortation to children "don't go too far from camp or the Datog will get you". Each could equally well apply to protection from Lions, Hyenas, Leopards.

Datoga demography

Borgerhoff-Mulder (1992) published results of an initial study of Datoga demography in the Eyasi basin. Ages were assessed using a quite detailed historical event calendar (some of which I was able to use for estimation of Hadza ages). Most women married at age 17-18. Divorce and remarriage was quite common (31% of the menopausal women had been married more than once). Polygyny was 'prevalent", Borgerhoff Mulder reports that the husbands of interviewed menopausal women had on average 3.69 wives. Reproductive history interviews of 102 menopausal women gave a TFR was 6.9 births. Only 3% of women had no births. There appeared to be a strong birth seasonality, with low rates of births during the late dry season between August and November (late dry season) and high rates in April – July. Mean inter-birth interval was 33.68 months. Infant mortality was .2058 for boys and .2003 for girls. Infant mortality was higher for firstborns than later born children. Mortality for ages 1-4 were .1224 for boys and .0733 for girls. Survivorship to age 15 was .6507 for boys and .6976 for girls (quite a bit higher than the Hadza .5745 and .5563 respectively). There was some suggestion that children had a better chance of survival in Mangola and the Yaeda valley than elsewhere further from agriculture.

The survival rates run close to Coale & Demeny model West level 10, which give female life expectancy at birth of 42.5 years. Combined with the TFR of 6.9 these figures imply a very high rate of population increase. Although Borgerhoff Mulder distrusts her estimates of sex ratio at birth, any reasonable figure of sex ratio and mean age at childbirth predicts a GRR between 3 and 3.5. Linked to mortality level west 10 this suggests a growth rate of 2.2 – 2.8 % p.a. (C&D p 89). We cannot tell whether the Datoga population has been stable, nor do we have measurements of rate of immigration to the Eyasi basin. The total number of Datoga in the Eyasi basin was estimated as 4000 - 5000 by Borgerhoff Mulder (1992:386).

Maasai.

The literature on the Maasai and their history far exceeds that on the Hadza and all their other neighbors combined. The early literature has become a study in its own right, a place to pick over the biases of colonial and post-colonial administrators and anthropologists, and a place in which to explore ideas about ethnicity and its nature. Thus

there has been much debate about the nature of "the Maasai expansion", though universal agreement that whatever it was, it happened, and it happened during the eighteenth and early nineteenth centuries. It led to the current very wide distribution of self-identifying Maasai families. According to the genetic and linguistic historians, the Maasai and their language belong to a second wave of Nilotic speakers who arrived in east Africa within the past 1500-500 years (Turkana, Samburu, Maasai).

Modern, intensive studies of Maasai economy and ecology have been conducted during the last several decades by anthropologists such as Homewood and McCabe (McCabe et al 2010) and by historians, particularly Waller (1988). Homewood, Kristjanson & Chenevix Trench (2009) summarize and compress the history conveniently in their Table 1.1.

A valiant, and exemplarily critical study of Maasai demography was undertaken by Ernestine Coast (2001) during her 1997-1998 fieldwork. She shows the long history of stark contrasts between administrative certainty about Maasai demography and the flimsiness of the actual evidence (Coast 2007). Few of the early studies described the methods by which they reached their estimates of fertility, infant and child mortality, infertility, or population change. The estimates differed widely. In her own study Coast pays close attention to the difficulties that may have led to the superficiality of the early studies. The difficulties posed by the Hadza tendency to change names can eventually be overcome. But the Maasai avoidance of naming the dead evidently cannot be overcome nor circumvented. It poses insuperable difficulties for close demographic study. Even calculations of adult mortality from widowhood suffer from the suspicion that long dead early wives will simply be lost from the record. Attempting to estimate infant and child mortality by comparing the record of births to the record of currently live children falls under suspicion because childless women are often given a child to raise and call their own.

Estimates of Maasai infant mortality range from Coast's extremely low figure to as much as 50% by deVries (1984) in a follow-up to 6-8 months of just 13 infants during 1974 reportedly an extremely difficult year. Meegan et al (1994) report 186/1000 in a longitudinal study of 138 mothers, and Nangawe et al (1984) 355/1000 by unspecified methods (Coast Ch 8 section 8.1 (p 117). Coast reports Maasai beliefs that pregnant women should strictly limit their food intake to produce a smaller, more easily delivered baby. There appears to be no birthweight data available but the practice might be expected to produce very high infant mortality. It might be difficult to reconcile the high estimates of Masai infant mortality with the estimated rate of population growth.

Coast attempted to study Maasai demography on the large scale, a large segment of northern Tanzania, and two districts in Kenya, 1545 households, for a total population of about 11500 people (Coast 2001 Table 3.2). Given the sample size, and the abundance of Maasai historical age markers, the estimate of population structure would be expected to be rather robust. Its 53.1% of population below age 15 suggests, if there were no severe recent wars, migrations and epidemics, a highly fertile and rapidly increasing population. But in C&D models the 53% below age 15 is only matched in the tables for

the very highest fertility and low mortality. Coast comments that the age structure shows a deficit of males aged 20 - 49. If the missing men were alive, the age structure would be different, there would be more adults and so the percent below age 15 would be diminished. This would bring Maasai figures into the realm of realistic populations.

Coast (2001) reports her estimated growth rate at 3.9% p.a. and the Kenyan 1979-1989 census growth rate at 4.46%pa, slightly above the national figure for Kenya. Coast gives ample reservations about her summary figures for TFR 7.3, (8.2 in Kenya and 6.4 in Tanzania). Under-reporting of children who died is a major concern for birth histories. Mothers' failure to accurately recall the reference period was a serious issue when recording number of births in the past year, especially in Tanzania.

All the estimates of mortality are far below what one would expect. My rough matching of the age structure and fertility to Coale & Demeny tables suggests a life expectancy at birth at least 55 years, remarkably high for a population living with more difficult access to medical services than the national population as a whole. Estimated primary infertility of Maasai women was 2.9% in Kenya and 1.4% in Tanzania. Coast suspected these of being slight underestimates because childless women are often given a child to adopt. These are much lower than the national figure for Tanzania.

Coast's study leaves the reader discouraged. Perhaps the Maasai are a case for an unashamedly model based approach. But it is difficult to see how this would work when we cannot get any direct data on mortality that we would believe. A two census approach might work, if we can work around the great rate of migration and mobility of men. An anthropologist is of course inclined to recommend a smaller scale study. Perhaps a study should be confined to an area in which it would be possible to come to know families and educated Maasai at least as well as Sieff, Sellen and Borgerhoff-Mulder came to know their Eyasi Datoga families. Such a study would have to last several years and attempt to assess migration as well as fertility and mortality. It might also solve another of Coast's puzzles: "where have all the young men gone?" Missing young men distort the age pyramid. Even if we share Coast's scepticism about the mortality data, and her fear that fertility was underestimated, we can see that a Maasai population could increase more than rapidly enough to have fueled a "Maasai expansion" before and since the multiple disasters of the late 1800s.

Sandawe.

One hundred and fifty kilometers to the south east of Yaeda is the center of the Sandawe population, estimated at more than 30,000. They are mixed farmers who are generally described as having lived as hunters and gatherers until the 19th century. Like Hadza their language contains click consonants but unlike Hadzane (Sands 1998), Sandawe may have affinities to the Khoisan languages of southern Africa. They have no contact with the Hadza, except once when, as Hadza described to Lars Smith, the government organized an archery competition.

Despite their geographic proximity, separated by the forested mountains of the Mbulu massif, Tishkoff et al. 2009 describe the genetic distinctions between Hadza and Sandawe as extremely deep. Sands (1991) and others have shown that relationships between the Hadza and Sandawe languages are also extremely remote or non-existent. Tishkoff et al (2009) report that the genetic evidence is compatible with some inter-breeding between Hadza and Sandawe about 15,000-20,000 years ago superimposed on otherwise independent histories. In the text I discussed the coincidence with an extreme dry period and suggested Hadza and Sandawe may have intermingled when both migrated to the higher rainfall of the highland massif that separates them today.

Dorobo.

All previous visitors and authors have distinguished between Hadza and "Dorobo". Most literature treats Dorobo as hunter-gatherers and specialist honey traders. Bagshawe (1923) writes: " 'Dorobo' means in the Masai language a tsetse fly, a cattle killing nuisance. I have elsewhere mentioned three distinct tribes of Dorobo amongst the Maasai, each with a language of its own, at least one language being related to Datoga. There are other Dorobo about whom nothing is known, living amongst, but quite distinct from, the Kangeju [Hadza] north of Eyasi." "North of Eyasi" could refer to the area on the north-west side of Eyasi, between Endulen and Makao.

Blackburn (1982: figure 13.1) marks on his map, apparently near the east edge of the Serengeti, a group he denotes as "Mosiro/Kisankasa/Mediaki". Dorobos at Makao are known to contemporary western Hadza but attract little interest from them. One time, after a visit to the west, Gudo Mahiya and I drove back via Makao. As we went down a little by-road to drop off a Hadza hitch-hiker she casually remarked of a cluster of huts "there are the Dorobo, we live a bit further down the road". In Blackburn(1996, fig 8.1) the only Dorobo marked in Tanzania are Akie.

Alternatively, Bagshawe's "North of Eyasi" could refer to the Ngorongoro-Oldeani massif, north of which there are reportedly Dorobo today (McCabe 2010). This area of mountains is contiguous with the Loita hills in Kenya where Blackburn (1982) marks "Digiri" and in (1996 fig 8.1) marks Digiri and Omotik.

Fosbrooke (1972:156, and Fosbrooke & Organ 1963:14) briefly discuss Baumann's 19th March 1892 comments on a Dorobo camp in the crater floor. Jaeger reported Siedentopf's account of Maasai killing an entire camp of Dorobo near Ngorongoro. Hadza visit the outer slopes of Oldeani mountain but have given us no indication that they ever lived in the crater or the forest, nor have we seen any indication they claimed this to previous writers. Fosbrooke (1972: 155-157) makes it quite clear that the Dorobo of Ngorongoro and northward were distinct from the Hadza.

The Farler map (Farler 1882) marks another Dorobo group in the western parts of what is now Serengeti and the traders who he interviewed described them as Elephant hunters. Most likely, the label was supplied by Maasai informants and denoted merely

that these were lower status people who ate wild animals. We are given no information on what they called themselves. These may have been specialist hunters for the Ivory trade like the people Baumann referred to as "Makua", itinerant professional Elephant hunters. There may have been other local circumstances under which it paid better to be a forager-bee keeper than a herder. We should not buy into the Maasai perspective and assume that all Dorobo had been forced out of herding.

Today Hadza (except for the handful of western Hadza who live at Makao) have no contact with any Dorobo group. Hadza are no longer hunters in a world of hunters. But we might speculate about earlier times, pre-colonial times, before the Maasai expansion, before the Bantu expansion, before the Datoga-Kalenjin expansion, before the Cushitic speaking farmers. When were Hadza last living in a world of hunters among hunters, and what was it like? One possibility is that Hadza occupied a much larger range (discussed in the text connection with the genetic evidence for a Hadza population bottleneck). Another possibility is that the Hadza were surrounded by Dorobo groups. Another is that herders or Cushitic mixed farmers arrived before any Dorobo.

There are tiny, little known, so called Dorobo groups scattered widely in Tanzania and Kenya. Few are known in the anthropology literature by the name they use for themselves. Most have been known by names given by their more powerful neighbors (Berntsen 1976). Some speak, or until recently spoke, a Cushitic language, others Nilotic, and several speak only Maa. The "status" of Dorobo groups in east Africa has received much attention from historians and anthropologists and there has been much disagreement. I'm inclined to see the literature this way: if you write about Maasai you think Dorobo is a lowly social category that one falls into for a while after ill-luck and loss of livestock. With luck and hard work a Dorobo could acquire cattle and return to Maasaihood. This tradition apparently began with Merker, and continues in papers such as Berntsen (1976), and Chang (1982). These two papers actually make numerous important points, while clearly presenting the "lost their cattle" view. If you spend time with Dorobo (like Huntingford 1929, Kratz 1994, and Blackburn 1996, and Cronk 1989, 2004) you think of Dorobo as a number of independent peoples with their own histories and economic traditions. These two orientations do not exhaust the possibilities. And there are empirical questions to be asked. How much do they inter-marry with neighbors? Can men take wives among the wealthier neighbors? Do Dorobo adults raise their children as Dorobo? Is there observable recruiting to and from richer neighbors? Are people known to move in both directions between Dorobo society and the majority society? Different patterns of language use, and different genetic pictures might distinguish between the two views. Different Dorobo groups might show evidence of different histories. Genetic data might confirm or contradict different views of the origin of these populations but should not be mistaken for statements about their economic history. Linguists such as Ehret (references in Tishkoff et al.2009 SI) do however attempt to offer evidence about economic history.

Cronk (2004) gives a refreshingly clear account of the modern transition of Mukogodo (Yaaku) from Cushitic speaking hunter-gatherers to herd owning modern Kenyans who prefer to claim Maasai identity. His account includes histories of families

with members (apparently mostly female) who joined the Mukogodo from other economies and languages, and histories of families whose mtDNA suggests ancient links to other forager populations (Cronk (2004: 29). He also includes an excellent review of the British colonialists usage of the label "Dorobo" (his pages 63-69).

Ichikawa (1980) outlines the Suiei and their use of wild plants. He also reminds us of the evolutionary significance of ecological data on wild resources, regardless of what those using these resources call themselves or get called by their neighbors. Each group of Suiei sees themselves as descended from a neighboring pastoral group. His most striking finding is that, although the Suiei live in montane forest the great bulk of their plant food and all their hunting is in savanna. Their prey include most of the usual savanna mammals. Their plant foods overlap closely with Hadza plant foods. The forest is where they build their houses, hang their beehives and harvest their honey. The forest trees are the main source of flowers. He points out that montane forest is a difficult habitat in which to herd cattle. Herds split up and readily get lost or injured. Some of the terrain requires more agility to move about in than cattle can manage. Herders avoid the forest. Mukogodo prey apparently covered the full range of savanna mammals but with some apparent specialization on Hyrax (Cronk 2004:37-42). The fauna, as described by Cronk p 26 seems very similar to that of Hadza country. Their forest, described by Cronk (2004: 25) is clearly different from the highland forests of Ngorongoro and the Iraqw highlands, and apparently much drier than the Okiek forests. Hobley (1903) reports that Okiek "live principally on Colobus and other monkeys, which they shoot in the forest. At certain seasons, however, they go and hunt big game on the plains". Huntingford (1929) lists Okiek prey species that imply, in contrast to the Suiei data, that much of their hunting was in dense highland forest.

The best known Dorobo groups call themselves Okiek, live in apparently scattered small groups in highland forests in central Kenya and have been studied by Huntingford (1929, 1951, 1954), Kratz (1994) and Marshall (2001). They collect honey on a quite large scale, putting hives in trees, which are owned and harvested by the owner. Very large amounts of honey can be acquired and stored. Like several of the other "Dorobo" groups, they define territories over which they exert some kinds of restriction, and ownership of hives is strictly recognized. Blackburn (1973) has described the style of the pots that Okiek used to make to store honey and compared them with Nandi, Sirikwa and the archaeological Eburran artefacts. Huntingford (1929) describes Okiek hunting and honey collection then appends (his page 345) "Formerly the Dorobo possessed no stock, nor did they till the ground. During the last quarter of a century or so a few of those living on the edge of the forest have taken to cultivating small plantations… in which they grow eleusine grain…only. A few possess, at the present day, one or two cows; others have a few goats and sheep; no one has more than 5 to 10 head.". He gives us no evidence that this small scale farming was really new. All subsequent observers report some farming and livestock ownership among Okiek.

In 1982, just before my first visit to the Hadza, Lars Smith and I visited the southern end of "the Masai steppe" a large bush savanna area south of Arusha, some 300 km from Hadza country. Around Kijungu we met several Akie at their homes in the

bush. East of Kijungu was a small village of Akie who farmed but claimed to leave the village to travel about in the bush during the rainy season.
All over east Africa the plains might have been more useful to foragers in the wet season than in the dry. Much of what is now pastoral country could have been used this way, a wider version of Hadza wet season dispersion into smaller camps demonstrated in Lars Smith's report of the air surveys and by Marlowe (2010:41).

One Akie woman we spoke to, living in a disused Maasai boma, was trapping Guinea fowl, and had access to a couple of Baobab trees. She described these as important to Akie and some were "owned" by particular older men. More than one informant spoke of their long ago neighbors to the north, the Aramanik, Cushitic speakers. They could even delimit for us, by names of inselbergs, their border with Aramanik country. The Aramanik are apparently the Assax, whose language was partly described by Winter (1979) who claimed that the last Assax speaker died in 1976. Lars Smith and linguist Derek Nurse had in 1981 visited the Akie and they commented that "in the northern part of the area [the Maasai steppe] we established the remaining presence of at least some speakers of Aasa.". Nurse estimated that there might be "at least several hundred Akie-speakers". Nurse determined that Akie was a Southern Nilotic language, akin to Datoga, Nandi etc. (Nurse nd. fn 6). Ehret, cited in Tishkoff et al. (2009 SI:19), says that Akie speak a Kalenjin language with Cushitic loanwords.

Our search for Akie families led me to the impression that they were on the verge of disappearing without trace. On returning to the USA I found Maguire's 1927 and 1928 papers on the Akie (Mosiro). He described them in much the same way. When Lars and I visited them they had been "disappearing" for 55 years. We may ask exactly what is surviving: a number of people who are willing to identify themselves as Akie, a number of people who can fill the economic niche of professional honey traders, an actual population whose parents and grandparents would also have identified themselves as Akie? How small a human population can survive, doesn't there have to be much intermarriage with neighboring groups? Akie seem to have survived with enough self-identifying people to become organized around their cultural survival (www.dorobofund.org/hunter-gatherers).

MacGuire, and Bagshawe name a third group in the Masai steppe, which stretched west as far as Tarangire and Lake Manyara. Bagshawe uses the name Balanga and says they speak no language other than Maa. Bagshawe names a fourth group, Kisangaro. He says Kisangaro, Mosiro and Laramanik each have their own mutually unintelligible languages, all without click consonants.

The supplementary information to Tishkoff et al. (2009) combines the Tishkoff lab's genetic data with Ehret's encyclopedic knowledge of African languages to suggest the following history of east African Dorobo groups. The Dorobo in the Ngorongoro highlands north of the Hadza are the best fit to the traditional Maasai centered view. They are genetically close to the Maasai and speak Maasai. Their separation appears recent.

At the other end of the spectrum are three genetically Cushitic groups: Yaaku (Mukugodo), and El Molo in northern Kenya, and Akie (in the Maasai steppe in northern Tanzania), whose ancestors appear to have arrived in east Africa from the north between 5000 and 4000 years ago as foragers. Yaaku spoke a Cushitic language until the mid 20th century when they rapidly stopped foraging and "Became Maasai" (Cronk(2004). Akie speak a Kalenjin (Nilo-Saharan) language with Cushitic components. El Molo have been fishermen-farmers during written history. http://elmoloforum.org

A group who Tishkoff et al. (2009) refer to as Wata, and equate with Boni, cluster with their neighboring Cushitic agro-pastoralists, data compatible with their oral history which says they became foragers only recently. It is not clear to me that these are the same as people once called Watta or Waliangulo, allegedly specialist Elephant hunters, who were removed from Tsavo park to an area near the coast in the 1950s. Like other minority groups they now have a web site www.watha.org

I have seen no general demographic data in the literature on Dorobo (apart from Cronk's 2004 fig 3.5 which shows quite high fertility and reproductive success among Mukogodo women). This is unfortunate for several Dorobo groups use a system of age sets that ethnographers mapped onto the dated age sets of better known neighbors. This most "un – Hadza like" social feature would have facilitated demographically useful studies but also serves to suggest profound differences between Hadza and "Dorobo". These may imply that these people arrived not as foragers but as proto-Kalenjin and Cushitic herders but those who lived near mountains came to specialize in honey trading and hunting. Or they may have been superseded by later invasions of herders who found the plains more useful than the highland forests.

If any of the Dorobo goups came south as foragers we have to ask what features allowed them to prevail over previous forager occupants. I can see little in their technology to imply that they would prevail over Hadza or San by being better hunters or gatherers. But two aspects of social organization might have made a difference. One is the ethic of ownership of constructed bee hives. This might increase the offtake of honey in a given environment. But before accepting this argument we should investigate the economics of constructed hives in a wider variety of environments. Several interventionist attempts to get Hadza to make hives and cultivate honey have failed. We do not know why, although the likelihood that the potential "owner" could not refuse others equal use of the honey might have been a disincentive (the same argument as we have used for the failure of attempts to make them farm). Territoriality, such as some Dorobo groups report, and "ownership" might thus have prevailed over the Hadza-like "free for all". We would need to investigate the economic defensibility of these territories before accepting the advantage of the social convention. The other is the possibility that rigorous age sets are tied to effective military organization. Whether or not these arose in a forager, herder, or farmer context, they could, just conceivably, have allowed Dorobo foragers to displace earlier foragers by military might.

Raiding and warfare past and present.

As we in the wild west may recall, cattle, being both mobile and valuable, make economically excellent targets of theft. But herds cannot survive without water, and dry season grazing which tends to be in better watered areas such as rainy highlands. These ecological-economic facts (especially if we assume a tendency for populations to grow, discussed in chapter 11) put herders in conflict with other herders, and with farmers, and must ultimately account for the success of herder populations with military traditions. The youthful "warrior" age sets may often have exceeded utilitarian goals. But farmers had to defend themselves against herders, as well as often maintaining trading arrangements with them, and whenever farming allowed population increase, farming societies could compete for cultivable land. We have seen that the Iraqw population increased and expanded its territory upon pacification. Isanzu likewise have shown extremely rapid population increase since colonization. The pre-colonial climate of raiding and warfare may have kept all these populations stationary, or at least increasing only slowly. Its effects might not be by numbers of battle casualties but by disruption and caution. The effects would be analogous to some of the effects of predation on animal populations. Time is wasted in vigilance, habitat is avoided because it exposes individuals to predation. A similar suggestion has been made about buffer zones between north American indigenous populations. Some places were too near the dangerous neighbors and thus too dangerous to be worth foraging in.

Looking at the history of the neighbors of the Hadza leaves me more, not less, confident that Hadza population had been reduced to a low level at the end of the 19th century mainly by raids by neighbors. Effects from Datoga, Masai, and Isanzu raids seem equally likely to have contributed. I cannot separate effects of herders' expansionist raids from traders' slaving raids. But the survey has also implied that Hadza were not alone in being reduced by the climate of raiding and warfare. Iraqw history seems entirely compatible with their claim to have fled cattle raiding and moved into their small mountain enclave. Their population increase, like Hadza, followed colonial pacification, but exceeded the Hadza rate, as we might expect from the farming economy and plentiful land into which to expand under colonial protection.

Other changes followed colonization: schools, clinics, famine relief, missions but all were very few, and very selectively located. It is hard to believe that these had much effect on population growth in the Eyasi basin and neighboring highlands before the second half of the 20th century. Even in Mwanza, child mortality remained high and little changed from about 1920 to 1940, declining significantly only after 1940 (Walters 2008 Figures 6.2, 6.3, 6.7, Tables 6.1 and 6.3).

While the histories reported countless raids, wars, "driving out" of people, and this may have characterized relations between herders and farmers, it may not have been the way in which most hunter gatherers have "disappeared". Like Tanzanian governments and aid organizations, farmers may kill by kindness. Farmers arrive, offer novel goods (tobacco would do the job for Hadza) in exchange for permission to stay. They employ the men, marry the women, deplete the forager habitat, and in a generation or so the

foragers are absorbed. If anything, the puzzle is that it took so long that there were any foragers remaining to be seen in the 20th century. Not surprisingly some have argued that they remained mostly where farming was difficult (Foley 1982, but see Porter & Marlowe 2006).

Herders appear not to affect the hunter-gatherer resources so badly. Game and livestock coexist but surely are in some kind of competition. As Hadza frequently say, herders may modify the water sources in ways that make them inaccessible to wildlife. Even the foragers' plant foods seem quite resistant to grazing and browsing. But this impression, gained both in Ngamiland and Hadza land, may be merely because we have not observed for long enough to see the eventual effects of burning and of goats on regeneration of key plant species.

With respect to arid Africa in general, Hussein et al (1999) express uncertainty about changes in the rates of violence between farmers and herders in recent years. But inTanzania it is clear that raiding and minor wars between herder and herder, farmer and farmer, and herder and farmer were numerous and frequent before the colonial era. They became much less frequent after colonial control was completed around 1910. But cattle raiding does still occur (Ndagala 1991), and if less frequent may be expected to be more severe, given the economic incentives, and some access to guns.

Datoga, Iramba, Sukuma and Iraqw histories show extensive and frequent raiding. Only a very few references link any of this to the slave trade. Much appears to be a result of Masai incursions, and displacement of peoples, especially Datoga, by Masai expansion. I have found no information from before the Maasai were in northern Tanzania. It may be some time before archaeologists are able to offer estimates of rates and extent of fatalities from raiding and warfare before the Maasai expansion. We cannot tell whether the frequency of warfare in the 19th century represents its frequency in prior centuries, or prior to the Maasai expansion.

The histories of the neighbors show that the Hadza were not special targets but that raids and warfare were common enough to have affected their population as they appear to have affected all the other nearby populations. While the numbers of deaths, seldom reported, were usually small, the demographic effects of the constant threat may have been severe. Tomikawa reports that after colonial pacification Datoga dwellings became more spaced. Before, families lived in large groups with a common thorn fence. Tomikawa: p 25 "In the past when there were many fightings between tribes, the Datoga did not live in gheda. As each member of emojiga needed mutual defence, the family groups lived close to one another." A thorn fence enclosed several groups of houses. Each group had own gate (doshta). His description makes sense of Farler's informants' mention of Maasai "towns". The oral histories give little support to the view that the raiding and warfare in the Eyasi area was influenced by access to expanded trade with the coast. Threats seemed to come from Maasai to the north, and their victims, not from the largest trade route to the south of the Iramba and Nyamwezi. Hadza seem not to have been involved in the Ivory trade but to have suffered from it. Isanzu raids that took women and children ceased when Elephants disappeared.

Reading the histories of each neighboring population has an interesting spin off. There are occasional "cross-references". The account of the migrations of a well known Datoga called Magena (given to Tomikawa 1970) seems to correspond quite well to the Iramba reports of "the Magina" in Danielson 1961. Datoga and Iraqw histories seem to agree on the absorption of a Datoga group into the Iraqw, and perhaps of an Iraqw, or unknown small group in the area, into the Datoga. Such cross-matching might allow better dating of events in the oral histories as well as help us decide what aspects of them we can regard as historical observation, and what parts incorporate more complex aspects of communal memory (an issue that has fuelled many discussions in the literature (e.g.references given by Lawi 2000).

Micro-Summary of plausible historical influences on Hadza.

1. Isanzu raiding for women and children until Elephants gone. Isanzu presumably traded both to the central Tanzania trade route via Myamwezi entrepreneurs.

2. Datoga raid after displaced from crater.

3. Maasai raids. Kill random small numbers.

4. Isanzu as protection from Maasai, and increased cultural influence.

5. German and British pacification removed these pressures on Hadza but also on their neighbors, whose populations grew faster.

6. British promotion of WaIraqw displaced Datoga ino Eyasi Basin and led to Mangola irrigation farming. Productive land and much wildlife lost.

7. Tsetse clearance schemes allowed further encroachment by herders and farmers.

8. Presence of herders prevents Hadza attempting to keep livestock.

9. Iraqw farmers cultivate most of Siponga and occasional farming efforts in other parts of eastern Hadza country.

10. Political disregard of any land rights for Hadza until 2007.

Effect of these seems to have been not to change Hadza behavior (except since about 1995 in Mangola area) but to restrict their resources and make their lives more difficult.

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