

# Early phases of pastoral adaptation in the Central Highlands of Kenya

---

## Introduction

Early pastoral adaptations are known from two localities: Mt. Suswa in the Rift Valley 70 kilometers northwest of Nairobi, and Lukenya Hill 40 kilometers east of Nairobi. Successions at these localities demonstrate that pastoral adaptations are in place no later than 7,000 B.P. Between 7,000 and 3,500 B.P. domestic animals were kept as a supplement to hunting and gathering. Around 3,500 B.P. there is a shift in settlement location accompanied by the appearance of the first sites which are structured around the maintenance of domestic stock. Between 500 and 1,000 years later complex Pastoral Neolithic adaptations emerge and spread over wide areas in East Africa.

## Mt. Suswa succession

The site of Salasun (GuJj13) is situated in the outer caldera of Mt. Suswa (Bower and Nelson, 1979). It contains 260 cm. of cultural deposits and was occupied, probably on a sporadic seasonal basis, from ca. 8,000 to 1,000 B.P. The earlier series of horizons is capped by a greyish-green volcanic ash at 96 cm. These horizons have associated 14C dates on bone apatite ranging from 6,595 to 7,980 B.P. (Table 1). Due to the slow deposition rate (ca. 8.5 cm. per 100 years), faunal remains were highly comminuted on the surface prior to burial. Identifiable specimens are uncommon (ca. 5/cubic meter), but include the remains of domestic ovicaprids and cattle to a depth of 160 cm. (D. Gifford-Gonzalez and Kimengich, this volume). Though the earliest sherd was found *in situ* below 200 cm., ceramics do not become common until 150 cm. Stone bowl and platter fragments also occur in the upper portion of the succession between 170 and 110 cm. There is a single lithic industry represented at Salasun from the onset of occupation to the introduction of Iron Age technology, about 1,350 B.P.



Table 1

## Radiocarbon dates from Salasun and Lukenya Hill, Kenya

A—apatite; G—gelatin; C—collagen; Ch—bone charcoal; without letter—wood charcoal. All 14-C dates are 13-C corrected and given in radiocarbon years before present (B.P. = 1950 A.D.)

## Salasun (GuJj13), on Mt. Suswa, Kenya

GX-4420A	1,185 ± 140	DS 10 - 20 cm, weighted center 15.0 cm.
GX-4468A	2,990 ± 170	DS 40 - 50 cm, weighted center 45.0 cm.
GX-4421A	2,680 ± 235	DS 70 - 90 cm, weighted center 77.8 cm.
GX-4469A	6,595 ± 235	DS 90 - 120 cm, weighted center 109.6 cm.
GX-4422A	7,255 ± 225	DS 130 - 160 cm, weighted center 143.7 cm.
GX-6519A	6,840 ± 450	DS 200 - 215 cm, weighted center 206.7 cm. Earliest ceramics at site, <i>in situ</i> .
GX-6520A	7,980 ± 380	DS 240 - 260 cm. weighted center 245.9 cm. Possible ovicaprid (?) bone present at 235 - 240 cm. Base of site is 260 cm.
GX-5806	3,970 ± 125	DS 100 - 110 cm, weighted center 105 cm. Secondary carbonates at top of Stratum V. Date indicates that contamination due to soil carbonates may make the determinations below 100 cm. appear more recent than the bones which they date.

## Lukenya Hill, 40 km. east of Nairobi, Kenya

GX-5350A	19,330 ± 945	GvJm46. DS 51 - 54 cm. Microlith-rich LSA;
GX-5349A	20,780 ± 1050	GvJm46. DS 87 - 90 cm. Microlith-rich LSA; Overlies 110 cm. of deposits containing the same industry.
GX-5773Ch	11,950 ± 460	GvJm62. DS 130 - 140 cm. Same microlith-rich industry as at GvJm46.
GX-5773A	12,195 ± 330	<i>Ditto</i> . On bone apatite rather than bone charcoal.
GX-5774A	21,535 ± 980	GvJm62. DS 220 - 230. Transition between early LSA industry containing large microliths to later LSA industry with small microliths as at GvJm46. Overlies 4 to 6 meters of this LSA industry with large microliths.
GX-6754A	4,145 ± 240	GvJm19. DS 25 - 30 cm; cattle.
GX-6755A	6,040 ± 225	GvJm19. DS 50 - 55 cm; first cattle recovered at 50 cm.
GX-6756A	6,770 ± 225	GvJm19. DS 70 - 75. Ceramics become common at this point.
GX-6757G	8,170 ± 1500	GvJm19. <i>Ditto</i> , but on bone gelatin. Sample extremely small, less than 0.05 g. of recovered carbon; counted two days, average reported.
GX-6757A	8,010 ± 340	GvJm19. DS 90 - 95. First ceramics, a single sherd, appears 10 cm. below this sample.
GX-6758A	13,705 ± 430	GvJm19. DS 115 - 120 cm. Overlies 0.95+m. of the same microlith-rich industry as is represented at GvJm62 and GvJm46.
GX-7416	4,200 ± 155	GvJm19. DS 85 - 90 cm. Soil carbonate. Indicates carbonate contamination in the bone samples, may make dates appear more recent than the actual age of the bones which they date.
GX-7417	4,490 ± 160	GvJm19. DS 115 - 120 cm. Soil carbonate. <i>Ditto</i> .
GX-4160C	1,710 ± 135	GvJm44. Horizon 5. Unfiltered collagen, generally less reliable than apatite or gelatin. Cattle and ovicaprids.
GX-4160A	2,085 ± 135	GvJm44. <i>Ditto</i> , but apatite.
GX-5138	2,415 ± 155	GvJm44. <i>Ditto</i> , but wood charcoal. This sample helps measure



cont. Table 1

		the error due to contamination in the apatite and collagen determinations.
GX-4507A	2,030 ± 125	GvJm44. Horizon 3. Cattle and ovicaprids.
GX-4507G	1,775 ± 150	GvJm44. <i>Ditto</i> , but on gelatin.
GX-5348	3,290 ± 145	GvJm44. Horizon 2, wood charcoal. Cattle and ovicaprids account for 78% of identifiable faunal remains. Traded obsidian abundant for first time. Industry represented at top of GvJm19 and GvJm62 is here undergoing transformation. Sample overlies 20 cm. of deposit containing cattle and ovicaprids.
GX5775A	12,770 ± 650	GvJm48. Bone charcoal and apatite. Same microlith-rich industry as that present at GvJm19, GvJm62 and GvJm46; underlies PN on western margin of site.
GX-5347A	1,600 ± 130	GvJm48. Cattle and ovicaprids, large open site with heaps at margin, ceramics as GvJm44 Horizon 5.
GX-5347G	1,810 ± 135	<i>Ditto</i> , but on gelatin.
GX-5772A	1,840 ± 140	GvJm52. Cattle and ovicaprids, large open site with ash heaps, ceramics as at GvJm44, Horizon 5. No gelatin recovered from this sample.
GX-5774A	1,930 ± 175	GvJm184. Cattle and ovicaprids, large open site with ash heaps, ceramics as at GvJm44, Horizon 5.
GX-5774G	2,115 ± 130	<i>Ditto</i> , but on gelatin.
GX-7414A	2,045 ± 125	GvJm202. Burial in rock shelter adjacent to GvJm184.
GX-7414G	2,295 ± 135	<i>Ditto</i> , but on gelatin.
GX-4161C	970 ± 130	GvJm47. Cattle. Date is on unfiltered collagen. Sample from shallow exposures along road cut. Ceramics as at GvJm44 Horizon 5, plus new ceramic type.
GX-4161A	1,340 ± 145	<i>Ditto</i> , but on apatite.
GX-4506A	1,240 ± 145	GvJm41E. Iron age burial with iron ring.
GX-4506G	1,250 ± 115	<i>Ditto</i> , on gelatin.

Interpretation of data from Salasun is complicated by two factors: krotovinas and sample size. Krotovinas are common in the sediments, so it is fair to ask if the domestic remains in the earlier horizons were introduced by burrowing animals. This is not possible because burrows originating higher in the stratigraphy must pass through the greyish green ash covering the earlier sediments. Krotovinas in these early sediments, which date more recently than ca. 6,000 B.P., contain inclusions of the ash and are easily segregated in the course of excavation. It is possible, however, that some earlier krotovinas may have gone undetected, and this makes it difficult to assess the distribution of domestic remains in the earlier horizons. It is very unlikely, however, that all of the remains were introduced from the 6,000 B.P. level. Ovicaprids, cattle, ceramics and stone bowl technology cluster stratigraphically, and there are consistent changes in type frequencies and tool styles which would have been obliterated by undetected mixing if it had occurred on a scale large enough to account for the entire distribution of domestic remains between 165 and 100 cm.



The density of lithic and faunal debris below 165 cm. is less than one-tenth that of overlying levels. In addition, the lower levels were exposed in areas of less than one-half those of higher levels. Thus, if the frequency of domestic animal remains were constant throughout the early occupation at Salasun, we could expect no more than one such specimen below 165 cm. for every 20 above this level. Since the total number of domestic remains above 165 cm. is substantially less than 20, the probability of having recovered similar remains below 165 cm. is quite low. Therefore, we do not know if domestic fauna was in use during the early occupation of the site between 7,000 and 8,000 B.P. This is important because it would be useful to know if the initial occupation represented a shift in settlement patterns in response to the introduction of domestic stock, or if domestic stock was introduced later and had no effect on the location and structure of the site. Fortunately, such questions are more easily answered at Lukenya Hill, about 110 kilometers east and south.

### Lukenya Hill succession

The Lukenya Hill succession is long and complex. Here, a Later Stone Age Industry introduced more than 20,000 years ago (Miller, 1979) is relatively stable until ca. 3,500 B.P. By 15,000 B.P. (Tables 1-3) a broad-based hunting adaptation is associated with this industry. It focuses on small and medium-sized antelope, zebra and wildebeest. By 7,000 to 8,000 B.P., wildebeest are beginning to disappear from the faunal inventory as ceramics become common. By 6,000 B.P., they have been replaced by cattle, which constitute eight percent of the faunal remains until settlement patterns shift around 3,500 B.P. with the abandonment of GvJm62 and GvJm19. No ovicaprids are present in the early portion of the succession, but this may be a matter of small sample sizes. The highest ratio of ovicaprids to cattle in later components at Lukenya Hill is 2 : 7 and it is usually less than 1 : 20. Thus, samples from the early phases are not large enough to rule out the presence of ovicaprids (see Tables 2-3). In addition, if cattle were present in the assemblages prior to 6,000 to 7,000 B.P. (Table 1) in frequencies of less than five percent, their presence might not be detected with the samples currently on hand. This is an important point, because it leaves in doubt the exact relationship between the emergence of cattle and ceramics on the one hand and the decline of wildebeest on the other.

At about 3,500 B.P., GvJm19 and GvJm62 are abandoned while occupation begins or intensifies at other sites such as GvJm14 (Tables 1 and 3) and GvJm22 (Gramly, 1975). Domestic stock became abundant at some sites such as GvJm44. The stone tool industry begins to change rapidly and in fundamental ways. Large-scale obsidian trade begins and soon displaces the local raw materials almost completely. Some sites are for the first time structured obviously to keep sizeable herds of domestic stock. Ceramics become much more abundant and undergo a series of changes (Bower *et al.*, 1977).

Table 2

## Percentage of animals represented in the faunal assemblages from GvJm62, Lukenya Hill

x—present but sample too small to compute percentages

Species	Depth in cm.						
	0	50	90	150	210	250	380
Cattle	82						
Ovicaprid							
Rhinoceros							
Giraffe							
Buffalo					2		
Grevy's zebra			2		7	4	
Common zebra						11	
Equid			8	x	22	11	
Eland							
Wildebeest							
Kongoni			8		10	7	
Topi	4		2			4	
Alcelaphini			16		16	7	
Grant's gazelle			10		2	4	
Impala			23		7	14	
Thomson's gazelle			17		22	14	
Reedbuck							
Klipspringer							
Duiker (Ceph.)					2		
Oribi							
Steinbok							
Grimm's duiker							
Dik dik			8	x	2		
Wart hog					3	11	
Bush pig							
Suid							
Lion							
Caracal							
Cat ( <i>Felis</i> sp.)					2		
Hyena					2		
Honey badger							
Banded mongoose							
Mongoose		x	6	x		7	
Baboon							
Vervet							
Aardvark							
Hare							
Spring hare	14		2	x	3	7	
Sample size	28	1	52	11	59	28	



Table 3

Percentages of animals represented in the faunal assemblages from two sites at Lukeya Hill, Kenya  
 —: present in frequencies of less than 0.5 per cent; × present but sample too small to compute percentages

Species	Site and level or depth (cm.)														
	GvJm44					GvJm19									
	5	4	3	2	1	0	30	50	70	80	90	100	110	120	150
Cattle	98	92	70	67	×	8	8								
Ovicaprid	1	6	18	11	×	?									
Rhinoceros					×										
Giraffe										1					
Buffalo															
Grevy's zebra							2			6			8	8	
Common zebra		1	3	8			2			3	3	18			
Equid	—		3	1		5	10	5	2	2	9	19	19	21	
Eland													18		
Wildebeest								1	6	11	10	20	14	9	
Waterbuck															
Kongoni				4		5	2	5	10	10	11	2	4	4	
Topi								4							
Alcelaphini						24	18	20	22	13	9	12	14	21	
Grant's gazelle							2	1							
Impala						3	2	3				2			
Thomson's gazelle	—	1	3	8	×	21	21	12	10	9	9	14	6	4	
Reedbuck						5	2	12	15	13	11	7		1	
Klipspringer						13	5	12	8	7	3	7			
Duiker (Ceph.)	—					3	7		3		2	2			
Oribi							5	4	8	10	15	2	1	4	
Steinbok				1			2	4	5	8	3		3	1	
Grimm's duiker								2	5			2	4	8	
Dik dik			3	1		8	3	3	1	1	1		1	3	
Wart hog							3		2			2	3		
Bush pig										1					
Suid								1			2			1	
Lion									1		1				
Caracal										1					
Cat ( <i>Felis</i> sp.)							2		3			2			
Honey badger								1						3	
Banded mongoose										1					
Mongoose							2	1	1	1	1	2			
Baboon							3	1	1						
Vervet													1		
Aardvark											1				
Hare						3		3		7		2		1	
Spring hare		1				3	3	5		7	1	2	1	11	
Sample size	536	109	33	93	9	38	60	97	107	92	91	59	79	76	

Around 2,400 B.P. ceramic, lithic and faunal assemblages stabilize as settlement patterns again change with the occupation of a series of large Pastoral Neolithic sites, the latest of which is abandoned about 1,300 B.P. Cattle dominate the faunal assemblages (98 percent or more).

One of the most interesting aspects of the early succession is that cattle are introduced into a local hunting and gathering adaptation and have little effect on hunting patterns, site densities or settlement patterns for more than 3,500 years. This occurs at a time for which we have no evidence of environmental deterioration. Thus, the beginnings of food production as documented at Lukenya Hill do not suggest population stress and do not lead quickly to larger human populations or more complex societies.

#### References

- Bower, J. R. F. and C. M. Nelson. 1979. Early Pottery and Pastoral Cultures of the Central Rift Valley, Kenya. *Man* 13: 554 - 566.
- Bower, J. R. F., C. M. Nelson, A. F. Waibel and S. Wandiba. 1977. The University of Massachusetts' Later Stone Age/Pastoral Neolithic Comparative Study in Central Kenya. *Azania* 12 : 119 - 146.
- Gramly, R. M. 1975. *Pastoralists and Hunters: Recent Prehistory in Southern Kenya and Northern Tanzania*. Ph. D. Dissertation. Harvard.
- Miller, S. F. 1979. Lukenya Hill: GvJm46 Excavation Report. *Nyame Akuma* 14 : 31 - 44.