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Hunter-gatherers of the Middle Juba Valley, Southern Somalia, during the Early Holocene

Introduction

It is not always realized that the Juba, more than 1600 km long, is one of the major African rivers. It starts close to Dolo at the confluence of its three important tributaries: the Dawa, which for many kilometers is the boundary between Kenya and Ethiopia, the Ganale and the Weby. These rivers rise on the Ethiopian Plateau east of the Rift and of lakes Abaya and Awasa. The Uebi Scebeli River coming from the same region and draining a large part of Central Somalia and south-eastern Ethiopia joins the Lower Juba during exceptionally rainy years.

Archaeological surveys were started in 1982 in the Middle Juba Valley, an area almost unknown from a prehistoric point of view (Mussi 1982; 1984). A dam has been planned just north of the town of Baardheere and as a consequence, large stretches of land will be flooded. In 1985 we worked in the surroundings of Luuq. Many archaeological sites were discovered (Coltorti and Mussi 1987) and stereophotographical analyses of the area were carried out.

Geological background and landscape evolution

From the geological point of view, the Juba crosses the Luuq-Mandera Synclinoria in an almost straight north to south line. The youngest sediments outcropping are terrigenous rocks from the Lower Cretaceous lying over Jurassic and probably Triassic limestones more than 4,000 m thick (Burmah Oil Co. 1973; Carmignani *et al.* 1983). Eastward, in the Buur area and west in Kenya are cristalline basement outcrops (Abdirahim, Abdirahman *et al.*, in press).

The higher part of the region is characterized by a "planation surface", which rises progressively from the edge of the limestone outcrops towards the Ethiopian Plateau. The extraordinary smoothness of most of the area and the presence of senile soil profiles of laterite, calcrete and bauxite, are possibly evidence of the "African planation" developed between the Late Cretaceous and the Upper Eocene (King 1976). An important deepening of the river valley followed and inside it lies the "Faanweyn formation", built up by fluvio-lacustrine sediments connected with a lake more than 600 km^2 wide (Abdirahim, Abdirahman *et al.*, in press; Abdirahim, Ali Kassim *et al.*, in press). During a successive phase of downcutting the basin dried up and stream captures took place leading to the establishment of a water course not very different from the present one. Inside this thalweg the "prebasaltic continental formation" was deposited (Carmignani *et al.* 1983); fluvial and pyroclastic sediments were buried by a basaltic lava flow, the age of which is still uncertain (Ali Kassim *et al.*, in press). The establishment and evolution of the present day river valley followed this period and is probably pre-Quaternary. During the Quaternary the downcutting went on modelling a very gentle erosional glacis on evaporitic rocks around Luuq, while on more resistant rocks (*e.g.* Wajid Formation) deep gorges were formed. This progressive downcutting was interrupted, at least once, by the modelling of an alluvial terrace now standing 4 - 6 m above the thalweg. Close to Luuq Late Stone Age artefacts were discovered over these alluvial materials and suggest a Final Upper Pleistocene Age for the underlying sediments. There was a very important arid phase shortly before the end of Last Glacial (Rognon 1976; Gasse and Street 1978) when an increase in bed load probably prevented further downcutting. The subsequent terracing is connected with a climatic improvement and the progressive reforestation of the area.

The archaeological sites

Concentrations of prehistoric tools were regularly found on top of small residual hills inside the valley. They were discovered to the east of Luuq close to the long ridge of Goodobay-Kuredka (Buur Medow, Buur Ad, Buur Matacno north) as well as to the north, not so far from the left bank of the Juba (Buur Heela Shiid) (Fig. 1). The hills are usually capped by basaltic rocks, which are more resistant to erosion than the evaporites. They were shaped by fluvial erosion and remodelled by gullying and slope-wash which follow the main fractures of the basaltic covering. Locally continental prebasaltic fluvial sediments outcrop in between them, as at Buur Medow. Among them quartz and siliceous pebbles are present and were largely utilized during prehistory. Human settlement was possibly in part linked to the availability of raw materials. However, sites also occurred directly over evaporitic rocks (Buur Ad) or where basaltic rocks lie directly over the bedrock (Buur Heela Shiid). Dwelling on small hills

close to the river presented other advantages: from there it was possible to monitor the movements of hunted species as well as to get some protection from the dangerous animals, such as the leopards, which still live in the residual forest along the valley (Varty 1988).

Due to the short time available, only one site, Buur Medow 1, was excavated, though similar deposits were discovered at Buur Heela Shiid and Buur

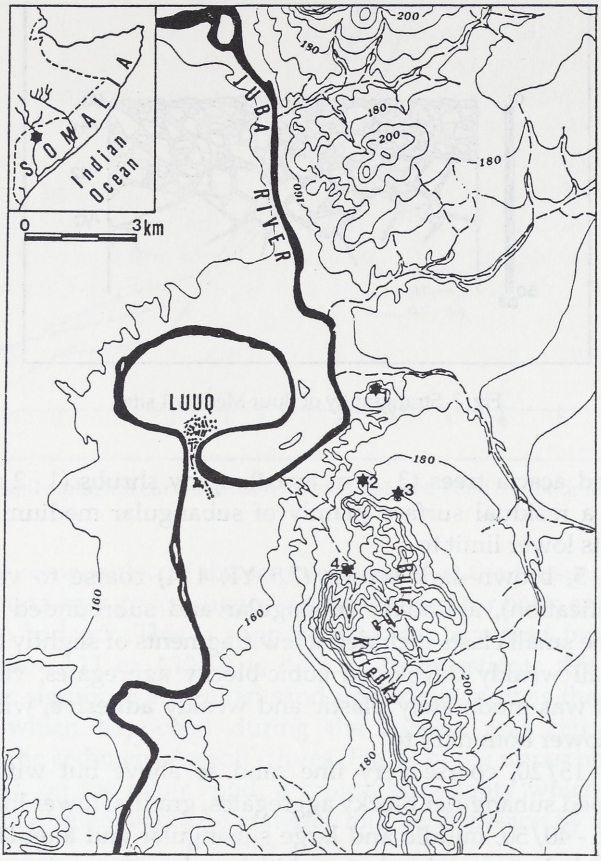

Fig. 1. Location of archaeological sites;
1: Buur Heela Shiid; 2: Buur Medow; 3: Buur Ad; 4: Buur Matacno north.

Matacno. At Buur Ad there was no soil horizon at all and the industry lay directly on bedrock. Only the lithic industry is usually preserved. We shall consider here Buur Medow 1 (3°47'20"N, 42°35'12"E (Mussi 1987) and Buur Ad (3°47'5"N, 42°35'42"E). A few eggshell fragments (most probably ostrich eggshell) as well as fossilized remains of a land snail (*Cyclostomus sulcatus)* were found at Buur Medow 1, and a small to medium size tooth of an unidentified ruminant Artiodactyl in each site.

Buur Medow 1 stratigraphy

On this hill scattered bedrock outcrops of columnar and massive basalts are present. There is no trace of active erosive processes except on the southern side where, in contact with fluvial sediments, some gullies have formed. The site stratigraphy shows from top to bottom (Fig. 2):

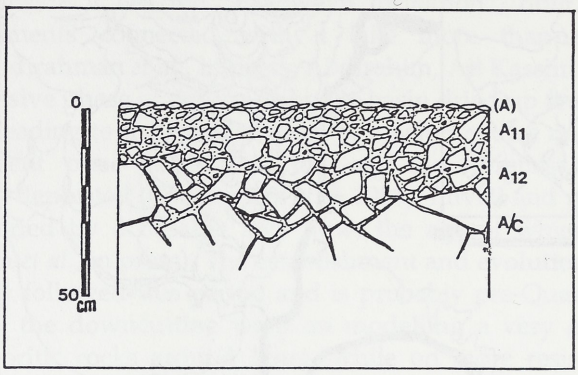

Fig. 2. Stratigraphy of Buur Medow 1 site.

(A): scattered acacia trees (3 - 5 m apart), spiny shrubs (1 - 2 m apart) and thick grass on a residual surface mainly of subangular medium size gravels, transitional at its lower limit to

A11: cm 0 - 5, brown-dark brown (7.5 YR 4/4) coarse to very fine sand (Doeglas classification), abundant subangular and subrounded medium and large debris. The small clasts included a few fragments of slightly cemented calcitic crust. Small weakly developed cubic-blocky aggregates, very thin, very scarce voids. It was moderately plastic and weakly adhesive, with thin scarce roots, gradual lower boundary to

A12: cm 5 - 15/20, coarse very fine sand, as above but with a very fine weakly developed subangular blocky aggregates, gradual lower limit to

A/C, cm 15 - 40/50, middle and large subangular and angular basalt fragments, few matrix between the clasts, whitish carbonate coating on the surface of the clasts, gradual transition to the weathered bedrock.

Inside the A11 horizon scattered pieces of charcoal and ash suggest an ancient fireplace. Flint implements were discovered mainly in the A11 horizon but a few of them even come from A12 and A/C layers:

Sample	Stones	Sand	Silt	Clay	Ph	$CaCO_3$	Organic carbon	Doeglas classification
A11–S.1	19.1	78.4	19.1	2.5	8.6	7.4	0.8	coarse sandy very fine sand
A12–S.1	15.5	64.5	31.3	4.2	8.5	6.3	0.7	coarse sand – very fine silt
A11–S.3	10.8	80.4	18.0	1.6	8.4	10.2	0.7	coarse sandy very fine sand

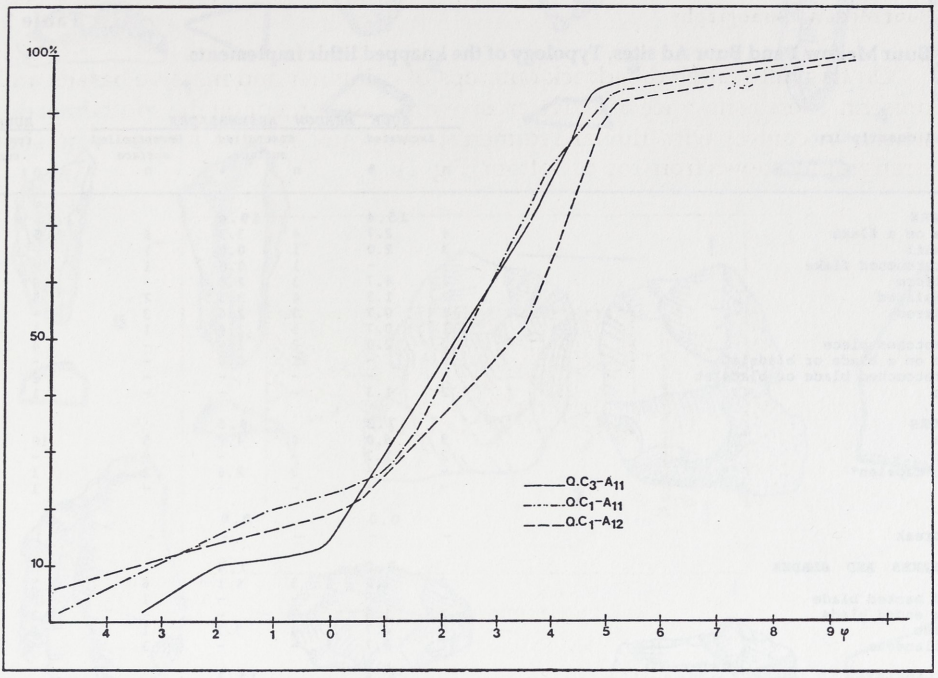

Fig. 3. Sedimentological curves of the horizons of square 1 and 3 at Buur Medow 1 site.

The sandy composition of the samples as well as the presence of carbonates and quartz round-mat grains suggest aeolian origins for parts of the fine fraction which rest on bedrock. This is supported by the increased percentages of silt and sandy from A11 to A12. It is difficult to investigate this evidence with palaeoclimatic significance: aeolian sand nowadays reaches the hill during the main rains, which happened during the survey, and can easily migrate downwards. The sedimentological curves (Fig. 3) of the upper horizon at square 1 and 3 reveal, on the other hand, a typical bimodality which testifies to the progressive enrichment in coarse material, following erosion by wind action.

The lithic industries

At Buur Medow 1, a 1 × 1 m grid controlled surface collection was made on 31 m^2, and 5 m^2 further were excavated. In all 3,358 lithic artefacts were collected within the grid, and more outside it. At Buur Ad, where there was no soil above the bedrock, 1,375 lithic implements were collected on 1,000 m^2 within 5 × 5 squares. We followed Tixier's (1963) typological list in our analyses (Table 1; Fig. 4 and 5; for further illustrations *cf.* Mussi 1987).

Notches and denticulates are the largest typological group. Being found at the surface, or close to the surface, trampling cannot be completely ruled out as a cause, but, it seems unlikely for: multiple notches are rarely found, while

Table 1

Buur Medow 1 and Buur Ad sites. Typology of the knapped lithic implements.

Type n° and description	BUUR MEEDOW ASSEMBLAGES					BUUR AD	
	Excavated		Controlled surface		Uncontrolled surface	Controlled surface	
	n	%	n	%	n	n	%
ENDSCRAPERS		**15.4**		**18.4**			**17.8**
1 single on a flake	4	2.7	4	3.3	6	5	3.3
1 thumbnail	3	2.0	1	0.8	1	-	-
2 on a retouched flake	-	-	1	0.8	1	2	1.3
4 nucleiform	7	4.7	3	2.6	-	8	5.3
5 denticulated	2	1.3	4	3.3	2	4	2.6
6 shouldered	1	0.7	3	2.6	3	-	-
6 nosed	1	0.7	3	2.6	1	1	0.7
7 on a notched piece	3	2.0	2	1.6	-	4	2.6
8 single on a blade or bladelet	-	-	1	0.8	-	-	-
9 on a retouched blade or bladelet	-	-	-	-	-	2	1.3
11 double	2	1.3	-	-	-	1	0.7
PERFORATORS		**7.3**		**6.5**			**8.0**
12 single	9	6.0	6	4.9	5	10	6.6
12 double	2	1.3	-	-	-	-	-
15 large "Capsian"	-	-	3	2.6	2	1	0.7
16 drill	-	-	-	-	-	1	0.7
BURINS		**0.0**		**0.0**			**0.7**
19 on a break	-	-	-	-	-	1	0.7
BACKED FLAKES AND BLADES		**8.0**		**7.4**			**13.9**
34 flake	2	1.3	5	4.1	6	5	3.3
37 curved backed blade	-	-	-	-	1	5	3.3
40 obtuse ended blade	2	1.3	-	-	-	2	1.3
42 fragment	7	4.7	4	3.3	1	9	6.0
- miscellaneous	1	0.7	-	-	3	-	-
BACKED BLADELETS		**8.6**		**13.1**			**9.5**
45 straight and pointed	-	-	-	-	-	1	0.7
46 straight and pointed with rounded base	-	-	-	-	-	1	0.7
47 straight and pointed with truncated base	-	-	1	0.8	-	1	0.7
55 with curved tip	-	-	3	2.6	1	1	0.7
56 with curved back	2	1.3	1	0.8	1	1	0.7
61 with narrowed base	-	-	-	-	-	1	0.7
63 partially backed	-	-	1	0.8	-	-	-
64 shouldered	-	-	1	0.8	-	-	-
66 fragment	11	7.3	7	5.7	2	5	3.3
71 with Ouchtata retouch	-	-	-	-	-	1	0.7
72 fragment with Ouchtata retouch	-	-	2	1.6	-	2	1.3
NOTCHES AND DENTICULATES		**35.3**		**35.4**			**25.9**
73 large notched or strangulated piece	-	-	1	0.8	1	-	-
74 notched flake	11	7.3	11	9.0	9	8	5.3
75 denticulated flake	29	19.3	23	18.9	25	24	16.0
76 notched blade or bladelet	4	2.7	4	3.3	1	2	1.3
77 denticulated blade or bladelet	8	5.3	3	2.6	-	4	2.6
78 saw	1	0.7	1	0.8	-	-	-
79 notched or denticulated piece with cont. retouch	-	-	-	-	-	1	0.7
TRUNCATIONS		**14.0**		**9.0**			**11.3**
80 truncated piece	21	14.0	11	9.0	9	17	11.3
GEOMETRIC MICROLITHS		**2.0**		**0.0**			**2.6**
82 segment	1	0.7	-	-	2	4	2.6
93 triangle with one convex side	2	1.3	-	-	-	-	-
VARIA		**9.4**		**9.7**			**10.0**
104 splintered piece	4	2.7	2	1.6	1	1	0.7
105 piece with continuous retouch	7	4.7	6	4.9	2	9	6.0
106 sidescraper	1	0.7	-	-	7	3	2.0
112 miscellaneous	-	-	2	1.6	1	-	-
112 miscellaneous bifacial tools	2	1.3	2	1.6	5	2	1.3
TOTALS	150		122		99	130	

denticulate edges have direct or inverse, usually semi-abrupt retouch; there is never the abrupt alternate and alternating retouch which is the rule on pseudo-tools. Notches and denticulates occur in the same percentages, in both excavated and collected tools. Generally speaking, implements have fresh edges; patina is

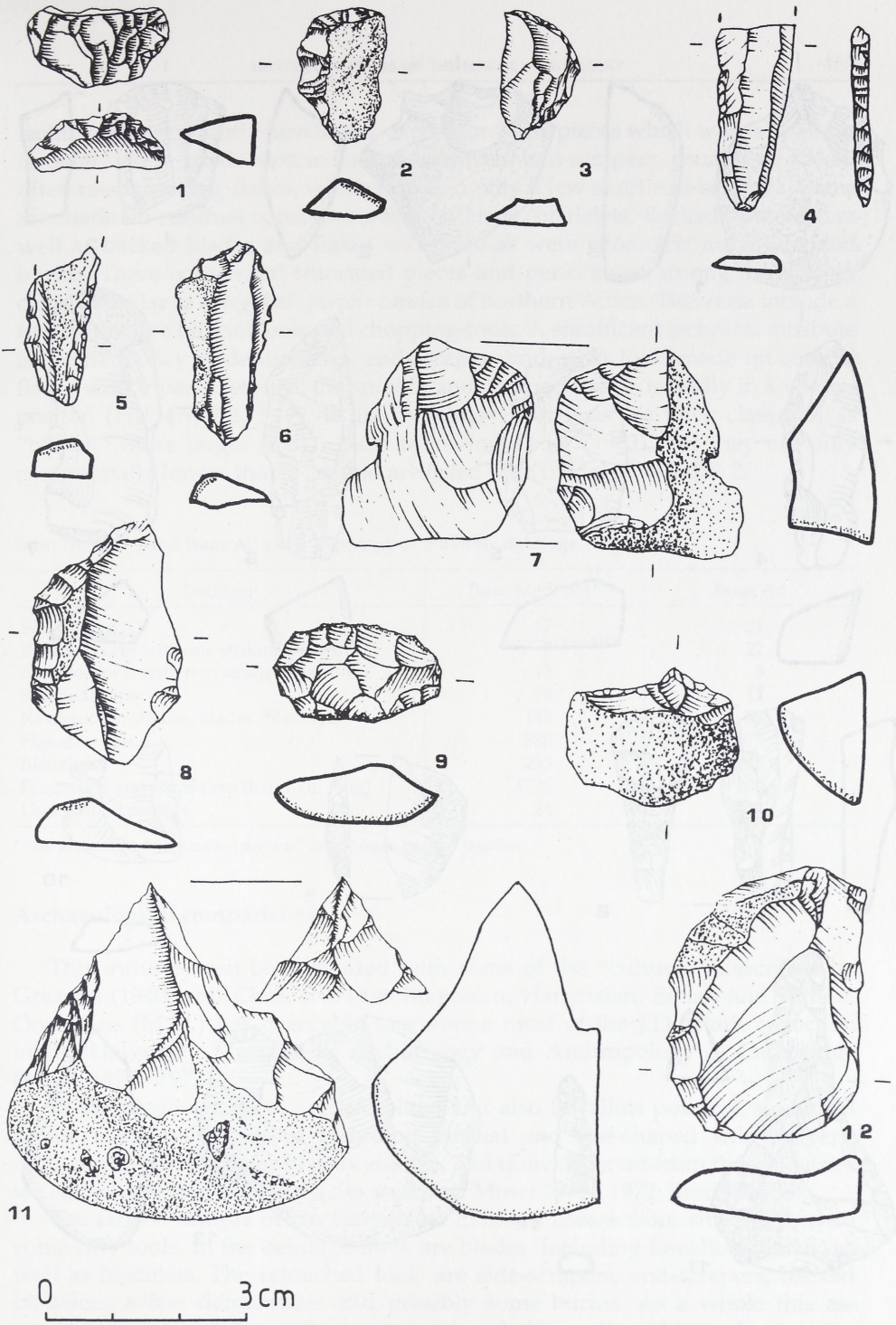

Fig. 4. Buur Medow 1 industry;

1 - 2: end-scrapers; 3: geometric microliths; 4 - 5: backed tools; 6: truncations; 7: varia (bifacial tools); 8 - 9, 12: denticulates; 10 - 11: perforators.

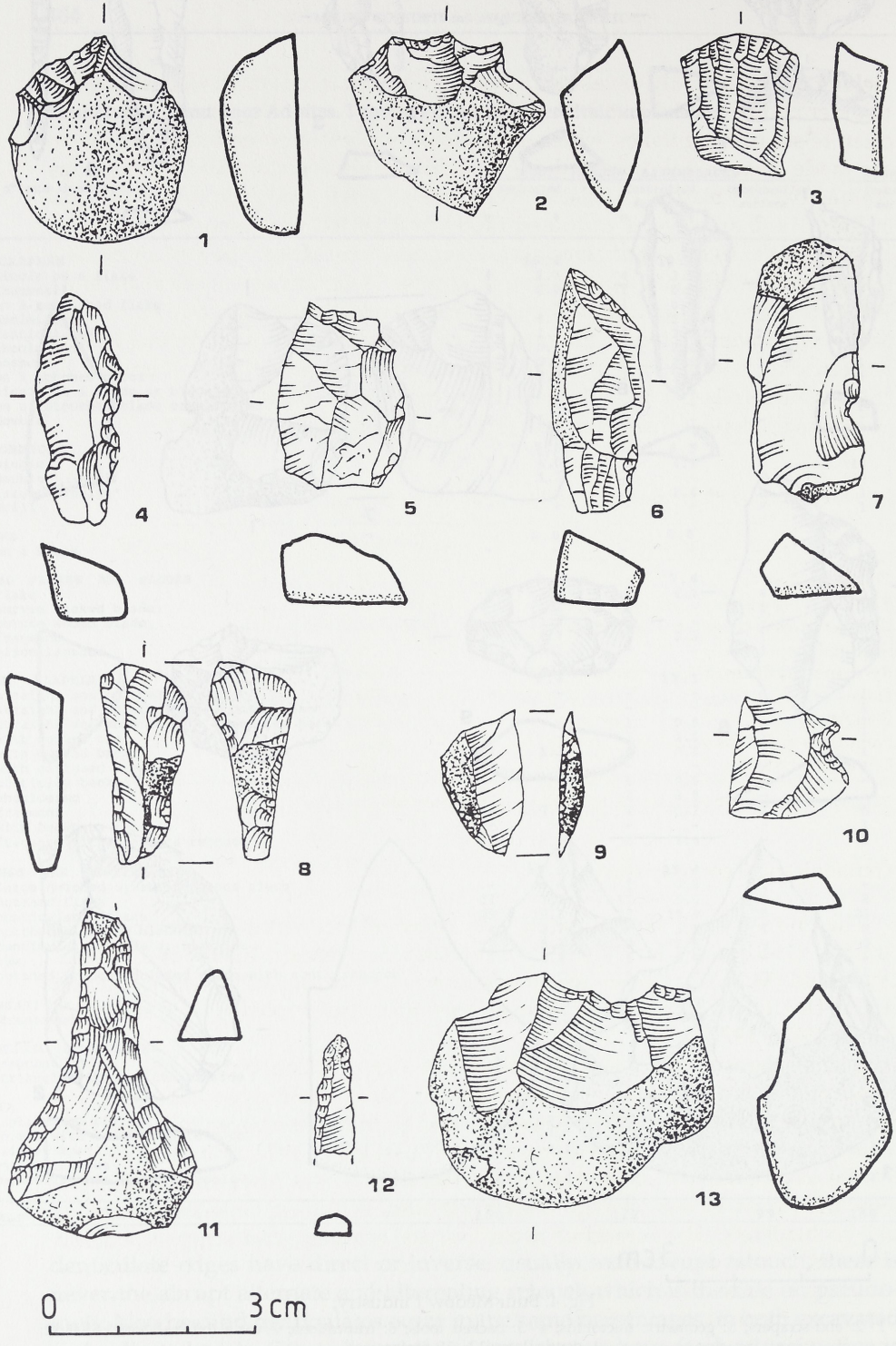

Fig. 5. Buur Ad industry;

1 - 3: end-scrapers; 4 - 5: denticulates; 6: truncations; 7, 10: notches; 8: backed tools; 9: geometric microliths; 11 - 12: perforators; 13: varia (bifacial tools).

lacking or very slightly developed, except for a few pieces which were apparently older and re-used. Next most common were end-scrapers, usually on flakes, often re-sharpening flakes, which included only a few short end-scrapers. Some are made on residual cores and a few on blade/bladelets. Backed bladelets, as well as backed blades and flakes were rare as were geometric microliths and burins. There are several truncated pieces and perforators, among them some closely similar to the *grand perçoir capsien* of northern Africa. The varia include a few distinctive bifacial tools and chopping-tools. A significant technical attribute is the frequency of denticulates, end-scrapers and other tools made on cortical flakes with inverse retouch: the smooth and compact cortex is oddly in a ventral positon (Fig. 4:9; 5:3, 5, 7). In the typological analysis we have classified as "blades" those larger than 1.2 cm following Tixier (1963), but they are only exceptionally longer than 5 cm and are listed with bladelets in Table 2.

Table 2

Buur Medow 1 and Buur Ad sites. Typology of the lithic debitage.

Debitage	Buur Medow 1*	Buur Ad
Flake cores	57	21
Bladelet cores with one striking platform	7	22
Bladelet cores with two striking platforms	13	8
Residual cores	39	17
Re-shapening flakes/blades/bladelets	148	52
Flakes	780	679
Bladelets	293	218
Fragments and chips (less than 1 cm long)	1726	200
Unmodified pebbles	24	7

* "Excavated" and "controlled surface" assemblages lumped together.

Archaeological comparisons

This industry can be compared with some of the "cultures" described by Graziosi (1940) and Clark (1954) as Magosian, Hargeisian, Eibian and Wilton. One of us (M.M.) has been able to examine most of the J.D. Clark collection in the University Museum of Archaeology and Anthropology at Cambridge (Mussi 1971 - 1972).

In the Magosian there are microliths, but also Levallois points, leaf-shaped points, many side-scrapers including bifacial and leaf-shaped side-scrapers. Apparently it is of Upper Pleistocene age, and quite different from the industries we are considering here (for a discussion *cf.* Mussi 1971 - 1972; Brandt 1986).

The largest sample of the Hargeisian industry comes from site H12R, with some fifty tools. In the debitage there are blades, including Levallois blades, as well as bladelets. The retouched tools are side-scrapers, end-scrapers, backed bladelets, a few denticulates and possibly some burins. As a whole this assemblage is quite different from ours and probably earlier. This is also true for industries from Midishi 2 Cave and from the surroundings of Bosasso which Brandt (1986) has recently suggested are possibly close to the Hargeisian.

The Eibian culture of Graziosi (later called Doian by Clark) is the best known Somali prehistoric culture and large samples were retrieved through excavation. Unfortunately, it has not yet been studied and published to modern standards, but S. Brandt has been re-excavating the main site of Buur Eibi for some years. After our personal examination of the sample stored in Cambridge, we suggest that this industry is characterized by a fine-parallel or sub-parallel retouch which is found on small pointed limaces (Doian points), some being bifacial and even leaf-shaped, as well as on bladelets (Doian bladelets) and perforators. There are also small Levallois points, leaf-shaped points, side-scrapers of several types, denticulates, segments and backed bladelets. The industries found by us at Luuq are quite different and most probably markedly later. In the higher layers of the cave excavated by Graziosi, now named Gogoshiis Qabe, the industry is also quite different, but largerly unpublished, and associated with some grindstones. There are two C-14 dates: 9,180 ± 100 (UGa-5) and 6,900 ± 350 (Beta-7474) B.P. (Brandt 1986) for it.

The so-called "Somaliland Wilton" is known through surface collections and small scale excavations. It includes industries with backed bladelets, segments, end-scrapers of several types, some being short and very short, thumbnail or circular ones; there are sometimes associated pot-sherds. The available data are not sufficient to properly define a culture and assemblages of very different age could posssibly be mixed together; the pottery means that some at least are of Holocene age.

In Kenya the Eburran is known to be 16,000 to 5,000 years old (Ambrose *et al.* 1980). It is only found in the Central Rift Valley, close to Lake Nakuru and Lake Naivasha. Tools are often made on a blade or on a bladelet and burins are more frequent than end-scrapers. There are many backed tools, including geometric microliths, while perforators, notches and denticulates are rare or completely missing; the microburin technique was used.

A "Kenya Wilton" was found in the same Central Rift Valley by Leakey (1931), who briefly described it as characterized by a large number of small thumbnail and circular end-scrapers.

In Ethiopia a number of sites is reported. At Laga Oda, at the northern foot of the Harrar plateau, lies a prehistoric settlement with a C-14 age of 15,590 ± 460 B.P. (SUA 475) in which most of the implements are unretouched tools (Clark and Prince 1978; Clark and Williams 1978). At Lake Besaka, in the Rift Valley, below a sterile volcanic deposits some 11,400 years old, an archaeological layer with obsidian tools was found (Brandt 1980; 1986). End- and side-scrapers, lumped together, are 46% of the industry, while burins are 19% and microliths 30%; they include a lot of backed and truncated pieces, but no geometric ones. In the later industry of the "Metahara Phase", with a suggested age between 11,000 and 7,000 B.P., there are more microliths, with a very high percentage of segments, while end- and side-scrapers, as well as burins, are less frequent; the microburin technique is in use. Pottery is known during the following "Abadir Phase" possibly some 7,000 to 6,000 years B.P. At Aladi Springs, another Rift Valley site, an industry with a few backed blades and end-scrapers is some 11,000 years old (Clark and Williams 1978).

In several sites of Melka-Kunturé, close to Addis-Abeba, undated obsidian industries are known, which apparently belong to the L.S.A. Some were illustrated by Bailloud (1965). There are not many implements, microliths are missing, as well as apparently notches and denticulates, while end-scrapers and burins are frequent. At Kella (Hivernel-Guerre 1976) and Wofi III (Hivernel 1976), on the contrary, there are plenty of notches and denticulates, as at Luuq, but also pottery. The latter is also found in the Rift Valley, at Omo 297 (Chavaillon and Boisaubert 1977) associated with a lot of backed tools (60%), which included many segments. In Gobedra rock-shelter, close to Axum, six layers were excavated but only in level IIa were there many retouched tools (Phillipson 1977a). Level IV is C-14 dated to 10,110 ± 140 B.P. (P-2238) while the upper levels IIb and IIa have a C-14 age of 6,825 ± 165 (GX-4680) and of 2,806 ± 53 B.P. (BM-1153). Pottery is found from level IIb upwards. The industry of level IIa included many backed tools (most of them being segments), end- and side-scrapers; some denticulates are illustrated.

Clearly the industries found close to Luuq cannot be easily compared with any of the published industries either from Somalia or from the surrounding countries.

Conclusions

Prehistoric settlements with lithic industries apparently similar to that of Buur Medow 1 and Buur Ad, were found on the top of all small hills we visited in the surroundings of Luuq. They were not observed during a brief survey of the ridge of Buuraha Kuredka, so there is some evidence that the hills were purposely chosen by prehistoric human groups. The similarities in lithics suggest that this happened during a well defined span of time.

The analysed industries at Buur Medow 1 and Buur Ad have several typological, technological and stylistic characteristics not found elsewhere. We therefore suggest calling them "Luuqian industries". Although it is not possible to define precisely their chronology, we can offer some evidence by comparing them with other East African lithic complexes.

"Mode 5 industries", *i.e.* industries with backed microliths which were sometimes parts of composits tools, are only rarely found at the end of the Upper Pleistocene. They rapidly increase in number, and expand into new areas, from *ca.* 10,000 B.P. onwards (Phillipson 1977b; 1985). This, and the characteristics of the Luuqian industries (scarcely laminar, with many notches and denticulates) suggest that they are Holocene in age. On the other hand, we found no pottery or grindstones. In Northern Kenya, at Gamble's Cave and Salasum, pottery is more than 8,000 - 7,000 years old (Onyango-Abuje 1980; Wandibba 1980) and in Ethiopia pottery was in use 5,500 years ago both in the Omo Valley (Brown 1975) and at Lake Besaka in the Ethiopian Rift, where it was associated with grindstones (Brandt 1986). Later on, by at least 3,000 years ago, Pastoral Neolithic groups were established in the East African Highlands, and

flourished during more than one thousand years (Ambrose 1980) using pottery, polished stone axeheads, and had domestic animals. Human groups with pottery and domestic animals also lived east of Lake Turkana some 4,500 to 4,000 years ago (Barthelme 1985). In Somalia itself, in the Buur region, pottery was used more than 5,000 years ago (Brandt 1986). While it is not appropriate to draw strict parallels between archaeological assemblages, apparently similar, but found far away from each other, and made by human groups filling different ecological niches, we believe that a time later than the end of Pleistocene, but earlier than the diffusion of pottery, can be suggested for the Luuqian industries; it is assumed that they are between 10,000 and 5,000 years old.

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