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Shabona: an Early Khartoum settlement on the White Nile

Palaeoecological setting

Shabona is, we believe, to date the most southerly site at which the Early Khartoum Complex and Tradition have been found (Fig. 1). It is situated some 8 km east of the White Nile at *ca* 14°38' N, 32°16' E and 110 km south of Khartoum. It lies on the northern edge of a large embayment that was formed during the extensive flooding of the Gezira, the region between the White and Blue Niles, in the Terminal Pleisto-

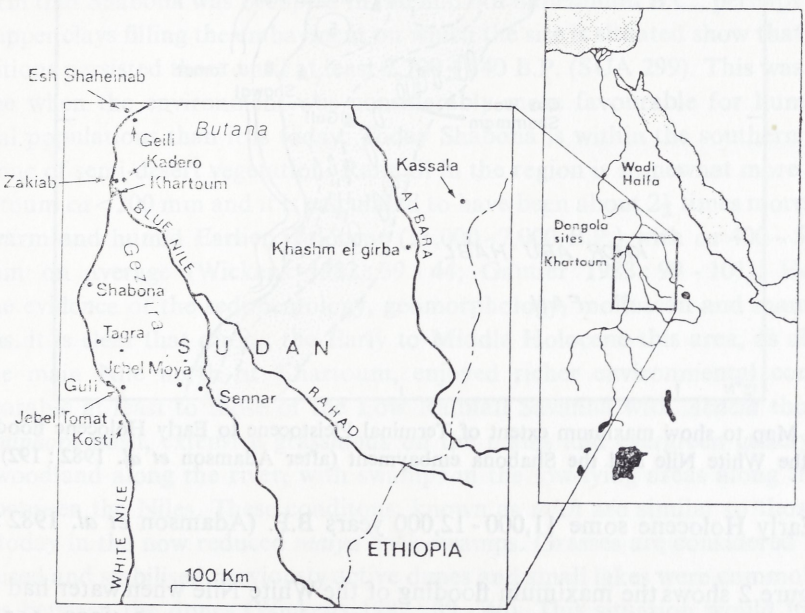

FIG. 1. Map to show geographical position of Shabona and other prehistoric sites on the Upper Nile (after Clark 1984 : 114)

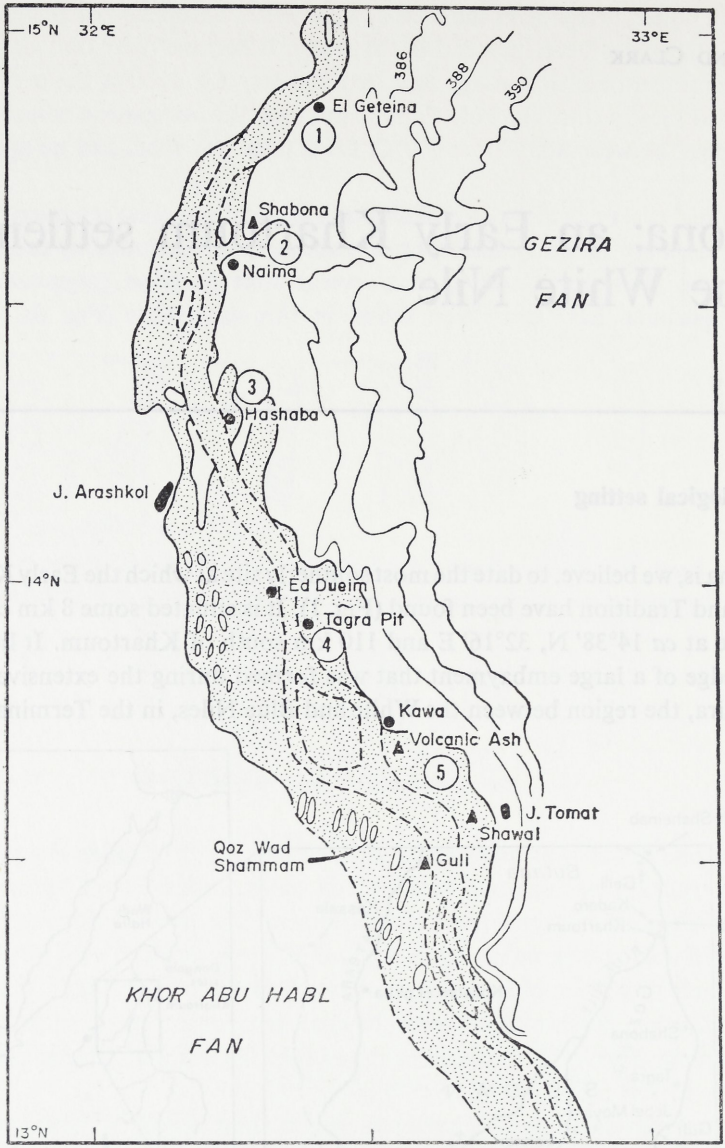

FIG. 2. Map to show maximum extent of Terminal Pleistocene to Early Holocene flooding of the White Nile and the Shabona embayment (after Adamson *et al.* 1982 : 192)

cene/Early Holocene some 11,000 - 12,000 years B.P. (Adamson *et al.* 1982 : 199 - - 209).

Figure 2 shows the maximum flooding of the White Nile when water had begun to flow again from Lake Victoria *ca.* 12,000 B.P. Adamson *et al.* (1982 : 165 - 219) have shown that prior to this time during a period of desiccation probably lasting

18,000 years or more, the White Nile was a highly seasonal river cut off from its water supply from Lake Victoria. At that time sands in the bed were redeposited by wind action resulting in the formation of an extensive area of old sand dunes from the Shabona area northwards to El Geteina.

In addition, at this time palaeo-channels draining from the Blue Nile deposited fine sands and carbonate gravels across the plain and along the eastern side of the White Nile. This extensive aggradation of sands was a factor in limiting the areas later flooded in the Early Holocene when grey clays with freshwater molluscs were deposited betwen 8,000 and 11,000 B.P. on former soil surfaces. At the same time the general flatness of the topography ensured the existence of extensive areas of permanent water and seasonal swamps between the two rivers. At the time of the Early Holocene when Shabona was occupied, the high flood level of the Nile was some 10 - 6 m above present flood level. At Tagra, some 60 km south of Shabona, the 8,000 B.P. Early Holocene clays yielded a broken barbed bone point fragment, together with fish and mammal bone (Adamson *et al.* 1974). It seems likely, therefore, that populations of specialized hunter/gatherers occupied selected sites along the White Nile from the time of the final recession of the pre-Holocene White Nile Lake around the beginning of the Holocene some 10,000 - 11,000 years ago.

The main sand ridge on which the site of Shabona is situated is believed to be a wave-trimmed fore dune which probably originated as a channel bar that later was reworked by wind action (Adamson *et al.* 1982 : 207). Two dates of 7,050±120 B.P. (SUA 298) on *Pila* shell and 7,470±240 B.P. on human bone (SUA 2140) confirm that Shabona was occupied in the mid 6th millennium B.C., perhaps earlier. The upper clays filling the embayment on which the site is situated show that swamp conditions persisted there until at least 2,700±140 B.P. (SUA 299). This was clearly a time when the environment was considerably more favourable for human and animal populations than it is today. Today Shabona is within the southern part of the zone of semi-desert vegetation. Rainfall in the region is somewhat more than at Khartoum *ca* < 200 mm and it is calculated to have been about 2½ times more during the warm and humid Earlier Holocene (11,000 - 7,000 B.P.) with *ca* 400 - 500 mm of rain on average (Wickens 1982 : 39 - 44; Gautier 1983 : 99 - 101). However, on the evidence of the sedimentology, geomorphology, molluscan and mammalian faunas, it is clear that during the Early to Middle Holocene this area, as also that of the main Nile north of Khartoum, enjoyed richer environmental conditions comparable at least to those of the Low Rainfall Savanna with *Acacia* thorn and *Commiphora* bush, extensive grasslands on the plains and evergreen gallery forest and woodland along the river, with swamps in the low-lying areas along the river and between the Niles. These conditons, known as *toich* are similar to those to be seen today in the now reduced *maiya* back-swamps. Grasses are considered to have colonised and stabilised previously active dunes and small lakes were common in the swales between the dunes (Wickens 1982 : 39 - 46). This situation would have put the savanna woodland zone to the southeast also within the range of nomadic

hunter/gatherers. Such a situation also supposes a northward shift of the vegetation belt of some 250 km or more during the wettest period.

These then were the conditions when the Shabona site was occupied some 7,000 years ago. For mobile hunter/gatherers with the ability to exploit the different micro--environments offered, this was a very favourable habitat, well stocked with game.

Geology

The geology of the central Sudan has a direct bearing on what raw materials were available to the occupants of the Shabona site and the degree to which they made use of them for the stone tool equipment. The river alluvium and Gezira Plain clays were usually devoid of stone but small pebbles of quartz and, more rarely, chert and chalcedony occur in the swales between the dunes and on deflated surfaces of the sand (Qoz) country immediately north of the site. The nearest outcrops of Nubian Sandstone from which these pebbles were derived, together with ochres, haematite and the sandstone used for upper and lower grindstones, are some 40 km distant to the north on the west side of the river. There are also variable quantities of rhyolite ($\pm 7\%$) and a very rare piece of basalt. The rhyolite is derived from the Sabaloka Gorge area at the 6th cataract *ca* 200 km to the north and the nearest source for basalt is approximately the same distance away. This suggests either a high degree of mobility on the part of the hunter/gatherer group occupying Shabona or the existence of some kind of exchange relationship with other groups.

Site location and stratigraphy

Shabona was surveyed and excavated for some three weeks between 13th February and 10th March, 1973. Those participating were A. B. Smith, D. Stiles and the writer from the University of California at Berkeley and D. Adamson and M. A. J. Williams of Macquarie University, N. S. W., Australia. Their collaboration in this research is here most gratefully acknowledged.

The contour plan of the site (Fig. 3) shows the occupied area to have been the top of the tongue-shaped, old lateral dune that rises some 2 m above the surrounding clays of the embayment. The occupation area was, therefore, initially close to the water. The occupation material is distributed in two areas – a more significant one at the northwest end of the site and subsidiary area to the southeast. Each of the two middens is about 200×130 m or 26,000 m^2 in area though that to the southeast was more deflated. It is, of course, not be to expected that any one time the occupation covered such an extensive area as 52,000 m^2. The site cannot have been

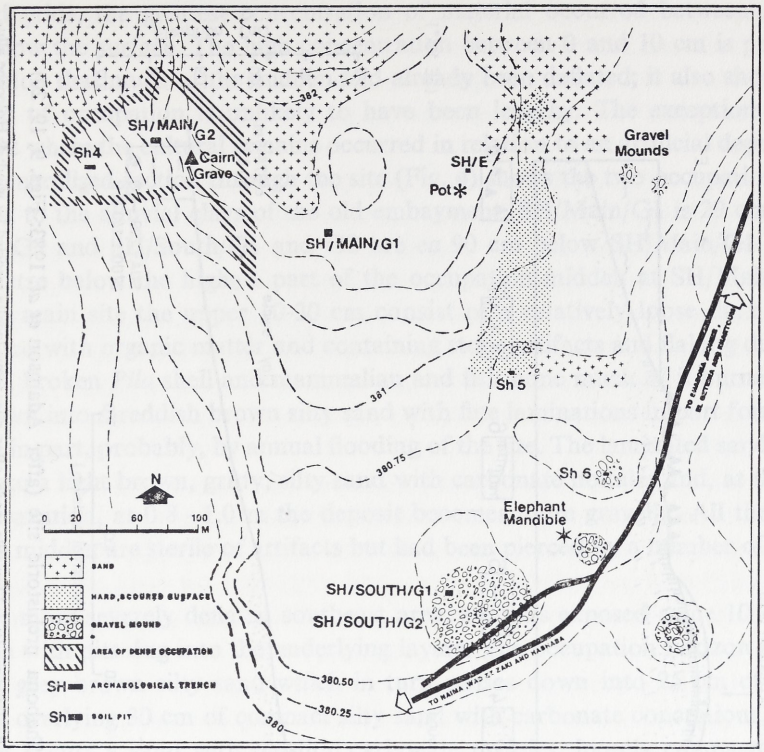

FIG. 3. Plan of Shabona prehistoric site (based on a contour survey by M. A. J. Williams and D. A. Adamson)

occupied continuously throughout the year and, judging by the practices of modern hunter/gatherers, each season's occupation would not have been on the exact place of the previous year's settlement. If the site was occupied sporadically for no more than 25 years it can be expected that occupation debris would cover a considerable area. Surface scatters also occur in the space between the two concentrations so that they may, in fact, have been even more extensive though the amount of deflation that the site has suffered can also be expected to have dispersed material to the extent that the boundaries of individual occupation areas cannot be clearly defined. The heaviest concentration of cultural remains occurs within the area known as the main site, though, here again, the midden has been seriously deflated.

Four areas were selected for excavation on the basis of surface finds – two in what we referred to as the main occupation (SH/G1 and SH/G2) and two in the southeast area (SH/South/G1 and SH/South/G2). These grids were, respectively, 16, 19, 20 and 28 m^2 totalling 83 m^2. They were excavated down to a depth coincident with the disappearance of occupation remains.

In most cases the depth of the midden did not exceed 30 cm though, in the case of pits and depressions, artifacts occurred down to a depth of 70 cm. In all the

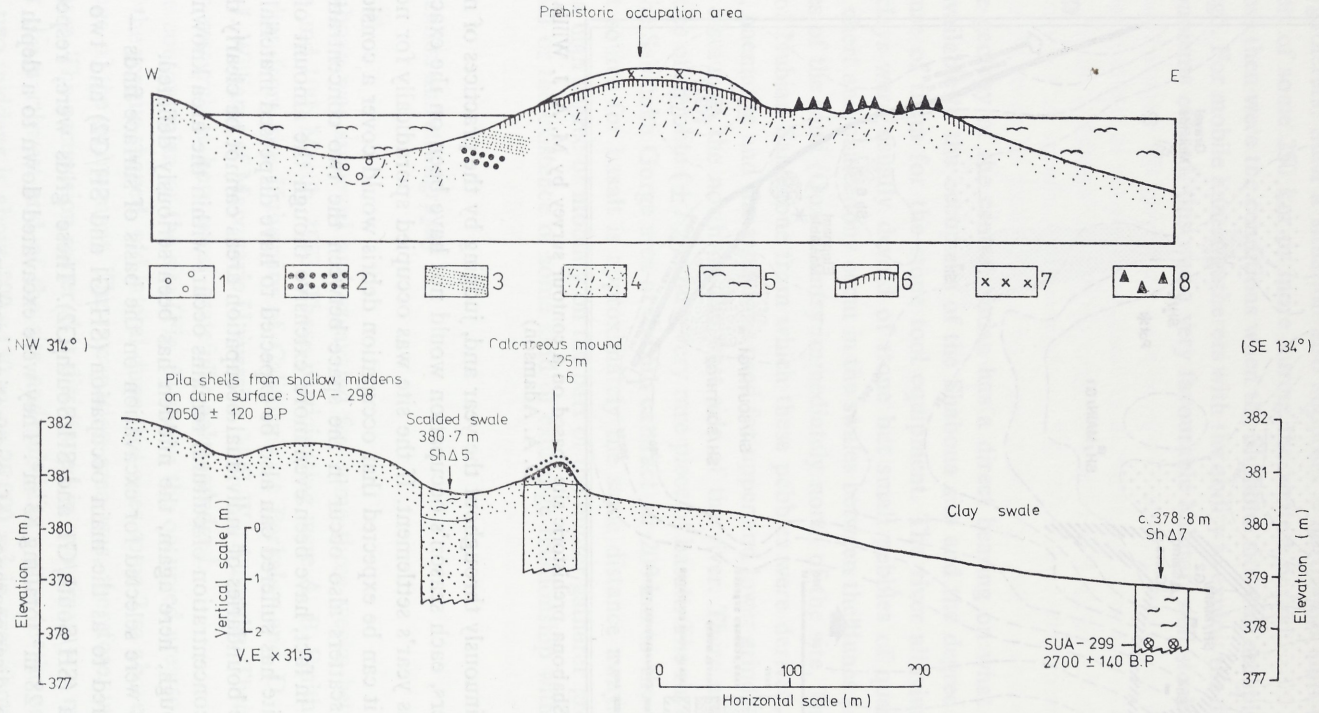

FIG. 4. Generalised stratigraphic sections through Shabona prehistoric site (after Adamson *et al.* 1983: Figs. 9, 19, 20)

1: Fluviatile quartz gravels; *2*: Water-rolled carbonate nodules; *3*: Stratified fluviatile sands; *4*: Fluviatile sands, often micaceous locally resorted by wind; *5*: Holocene alluvial and swamp clays; *6*: Indurated clayey sand of former surface; *7*: Early Holocene shell middens; *8*: Lag gravel of carbonate nodules

excavated grids, the greatest concentration of material occurred between 10 and 30 cm below the surface. The high concentration between 0 and 10 cm is probably an indication that much of the midden had already been deflated; it also shows that the period of occupation is unlikely to have been lengthy. The exception is SH/ /South/G2 where the cultural remains occurred in relation to an artificial depression.

The generalised section through the site (Fig. 4) shows the two occupation areas in relation to the alluvial clays of the old embayment. SH/Main/G1 is 29 cm below SH/Main/G2 and SH/South/G1 and G2 are *ca* 90 cm below SH/Main/G1 or just over a metre below the highest part of the occupation midden at SH/Main/G2.

At the main site the upper 10-30 cm consist of a relatively loose dark brown sand stained with organic matter and containing stone artifacts and flaking debitage, potsherds, broken *Pila* shell and mammalian and fish bone much of it burned. This passes down into a reddish brown silty sand with fine laminations in part formed by wind and in part, probably, by annual flooding of the site. The laminated sand passes in turn into a light brown, gritty, silty sand with carbonate nodules and, at the base of the excavation, at 0.8 - 1.0 m the deposit becomes more gravelly. All the layers below the midden are sterile of artifacts but had been pierced by a number of rodent burrows.

At the more severely deflated southeast area, sections exposed some 10 - 15 cm of midden with pits dug into the underlying layers. The occupation horizon overlies 20 cm of grey brown silty sand which in turn passes down into 25 cm of brown silty sand overlying 30 cm of compact silty sand with carbonate concretions. Below this again occurs a sand with pisolitic carbonate nodules, loosely compacted. The excavation was discontinued at 115 cm below the surface. This section presumably reflects the closer proximity to the water in the embayment with the concentration fo carbonates in the shallow groundwater adjacent to the shore. The stratigraphy in both midden areas shows no significant disconformity, textural and colour changes being such as might be expected from deposition in a generally stable environment.

Features

Shabona produced several interesting features throwing light on the behaviour of the inhabitants. Although no reliable estimate of the number of individuals is possible, it is probable that there were never more than 25 at any one time.

The amount of mammalian and fish bone on the site speaks of the importance of these food resources. Mammalian bone shows human fracture patterns for extracting the marrow. A high proportion of the bone is burnt indicating that it was prepared by roasting, probably in a shallow pit which is the commonest form of cooking meat in many parts of northeast Africa and the Sahara. Much of the fish bone also shows evidence of burning and dumping in shallow pits. At SH/South/G2 were found three circular, saucer-shaped areas *ca* 13 cm in diameter and 5 cm deep

filled with baked fish bone and small lumps of burned clay, again suggesting possible cooking methods. Another, larger pit in this grid measured *ca* 60 cm in diameter and 28 cm in depth. It was filled with broken fish bone from medium sized fish, largely unburnt. With this were a few fragments of mammal bone and the tip of a harpoon.

At SH/Main/G2 we found two roughly conical-shaped pits filled with *Pila* shells. The main pit was 1.0 m in diameter and 0.82 m deep. Most of the shells were whole and unbroken and of a large size; none were burned. With the shells were two fragments of a very large harpoon which fitted together. A small amount of fish bone and fragments of bovid bone were also found in the filling of the pit. Some of the *Pila* shells showed a cuneiform cut mark which may have had to do with the preparation of the snails if these were, as we believe, used for food, or, since *Pila* aestivate, these cuts might have resulted from the use of some kind of implement to dig them out of the mud.

A second pit in the same grid was shallower and more irregular – an asymmetric cone in section, measuring *ca* 1.0 m across at the top and tapering to 45 cm at the deepest part. This again contained unburned, whole *Pila* shells, together with several fish, including a complete skull of a catfish (*Clarias*) and mammal bone including, in the soft grey sandy silt matrix, a horn core. The contents of the top 10 cm or so in this pit consisted of fish bone, apparently burnt.

Another feature that time did not permit us to explore in its entirety was a roughly circular depression, 2.0 - 2.5 m in diameter at the top with gently sloping sides down to a maximum depth of 70 cm at the base. Since the stratification at the site is nearly horizontal, we assume this saucer-shaped depression to be artificial, having been dug into the looser, brown, sandy silt lying above the carbonate gravel layer. The filling comprised a grey brown silty sand matrix in which occur small fragments of fish and mammal bone together with some larger pieces of bone, especially in the bottom, numerous sherds of coarse vegetable- tempered pottery and some quartz tempered sherds. Worked stone is conspicuous by its scarcity. All this material lay at all angles in the section indicative of rapid filling. The use of the depression is unknown. It could have been a rubbish pit. On the other hand, it could be the base of a dwelling, sunk, as is so often the case, a little way into the ground.

Adjacent to SH/South/G1 was found a nearly complete elephant mandible and a large ulna; probably of a hippopotamus. Presumably these animals died or were killed at the site, since it is unlikely that the bones, particularly the elephant mandible, would have been carried in from any distance.

Burials

The last feature to be dealt with here are the burials. Five of these were found, all eroding, and mostly very fragmentary due to deflation. There were also two further collections of fragmentary long bone remains from the surface. The two

most complete burials from SH/South/G1 were full-length inhumations, one facing east, the other facing west; no grave goods accompanied the burials. There was no evidence that these burials were introduced though this might not have been unexpected in such a loose deposit. A radiocarbon date of 7,470±240 B.P. (SUA 2140), however, confirms the contemporaneity without any doubt. The other burials were so badly eroded that the position of the bodies was impossible to assess except in one case (SH/Main/G2) where the body appeared to have been flexed. All appear to have been buried in very shallow graves. The skeletal remains have been studied by Tamara McAuley and Christine Tennant of the University of California, Berkeley. Their findings are summarised below.

The remains came from 3 adult males, 1 sub-adult male and 3 adult females. They represent a population with a long and narrow cranium with normal to marked occipital bun, a robust face with moderate to pronounced prognathism and rectangular orbits; the mandible is also robust with features indicating "masticatory stress". The Shabona people compare well with the robust population of the Upper Nile during Terminal Pleistocene and Early Holocene times as seen from Nubia and from sites further south and that has been described as early Sudanese Negro stock. The individuals at Shabona appear to have been relatively healthy with only one case of dental caries and alveolar abcessing, one istance of trauma – a healed rib – and one of osteoarthritis of hand and foot. Pronounced occlusal wear is a feature, however, due no doubt to the nature of the diet and, in particular, to grit resulting from grinding plant materials. One of the females also shows evulsion of the upper incisors, a well-known practice among north African populations of this time.

Stone industry

The artifact remains studied by Debra Autry and the writer fall into four main categories: flaked stone, ground stone, bone artifacts and pottery. There are about 11.2% more potsherds than flaked and ground stone artifacts from the total of all excavated grid squares and surface collections. This may be due to the fact that all stone material had to be carried into the site while some, at least, of the pottery may have been locally made.

Flaked stone artifacts

By far the commonest raw material is quartz obtained from small pebbles from the Late Pleistocene palaeo-channels in the vicinity. The ratios of quartz and other materials by artifact class for SH/Main/G1 showed a preponderance of Wavy Line pottery and for SH/South/G2 which produced a high proportion of poorly fired, vegetable-tempered pottery, showed no significant differences. Quartz reached values of 67% and 78% respectively. Sandstone for upper and lower grindstones reaches 16% and 7% and rhyolite from the 6th Cataract, 9% and 10% respectively.

Other materials – chert, chalcedony, basalt and others – are of minor importance only although the amount of ferruginous stone – limonite, haematite and ochre for pigment – presumably obtained from the Nubian Sandstones on the west bank, reach values of 7% at the SH/Main/G1 grid.

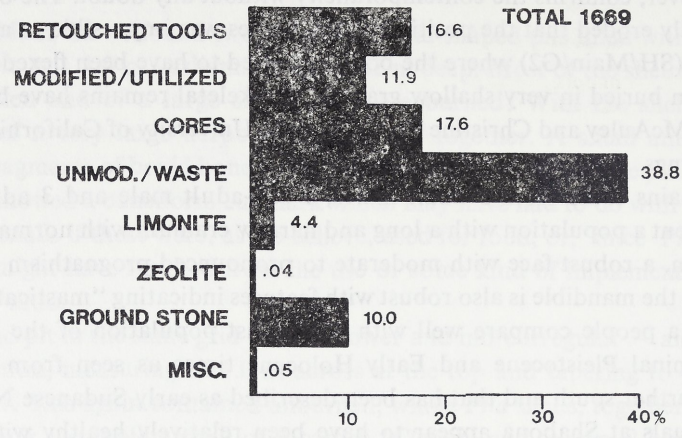

FIG. 5. Shabona. Histogram of all excavated and surface collected stone artifacts

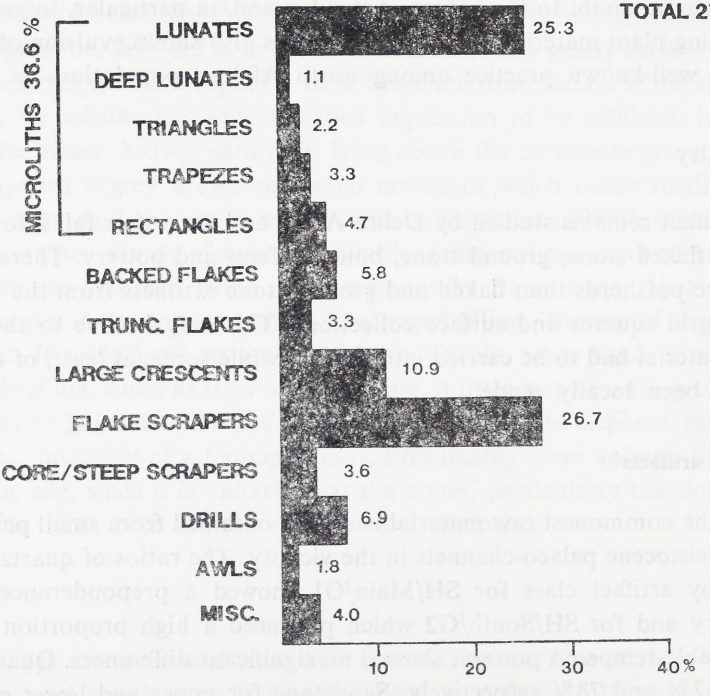

FIG. 6. Shabona. Histogram of retouched stone tools from excavations and surface collections

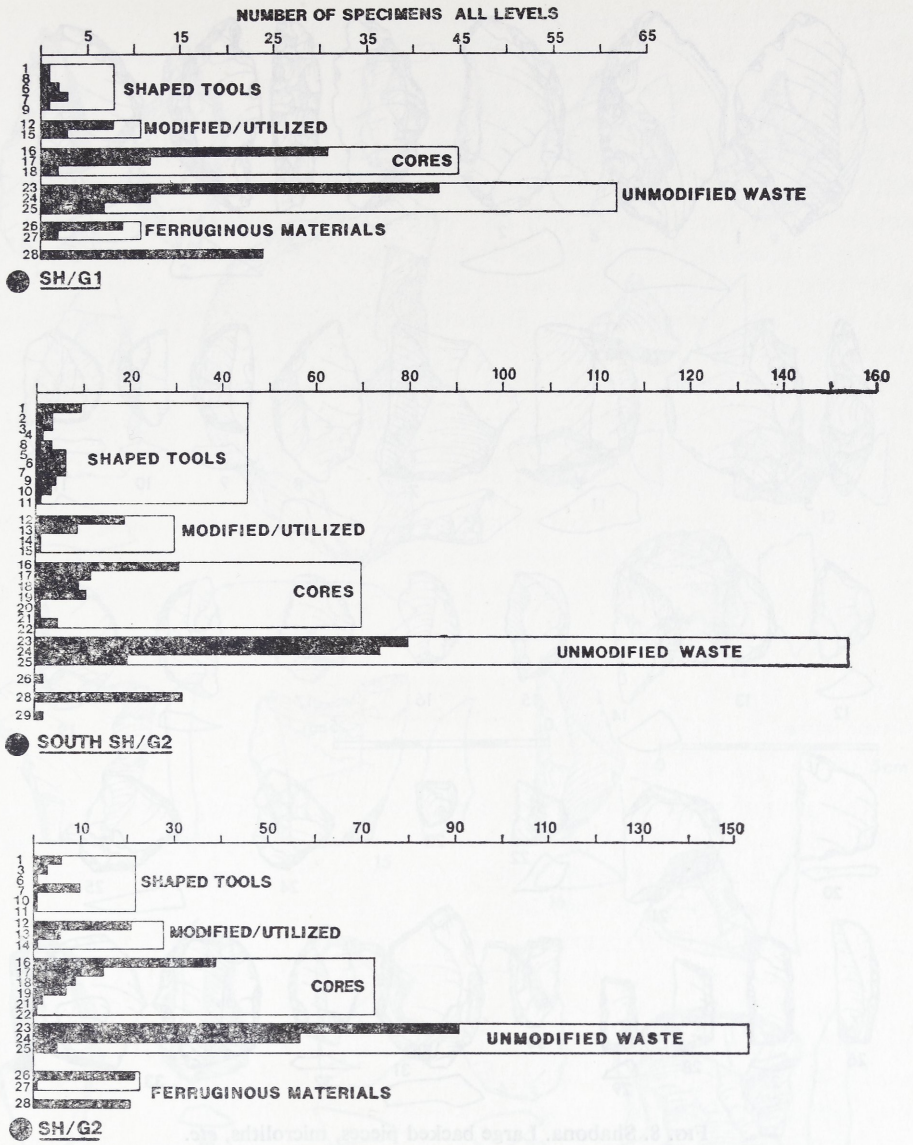

FIG. 7. Shabona. Histograms of breakdown of excavated assemblages from three grids

1: Lunates; *2*: Deep lunates; *3*: Trapezes; *4*: Rectangles; *5*: Truncated flakes; *6*: Large crescents; *7*: Flake scrapers; *8*: Backed flakes; *9*: Core/steep scrapers; *10*: Drills; *11*: Misc. retouched; *12*: Utilized/modified; *13*: *Outils écaillés*; *14*: Pebble fabricators; *15*: Hammerstones; *16*: Single platform; *17*: Double platform, *18*: Multi platform; *19*: Bipolar; *20*: Radial; *21*: Discoid; *22*: Biconical; *23*: Whole flake; *24*: Flake fragment; *25*: Angular waste, *26*: Limonite; *27*: Ochre; *28*: Groundstone; *29*: Celts

The percentages of all flaked and ground stone artifacts recovered are shown at Fig. 5. Cores and flaking waste – almost all quartz – show that manufacture was carried out on the site, whereas some of the other materials were probably

FIG. 8. Shabona. Large backed pieces, microliths, *etc.*

1 - 8: Backed flakes and "large crescents"; *9 - 19*: Lunates; *20 - 23*: Trapezes; *24, 25*: Isosceles triangles; *26 - 29*: Rectangles; *30*: Truncated flake; *31, 32*: Backed flakes; *33*: Backed flake with chamfering scar
1, 3 - 7, 33: Rhyolite; *10, 13, 21, 22*: Chert; *Remainder*: Quartz

carried in in the form of flakes. Cores are mostly single platform pebble cores but opposed platform and radially flaked pebbles are also typical. Retouched tools comprise more than 16% of the total assemblage. Upper grindstones and lower stone fragments are probably an underestimate as one of the features of the site appeared to be the quantity of grindstone fragments present.

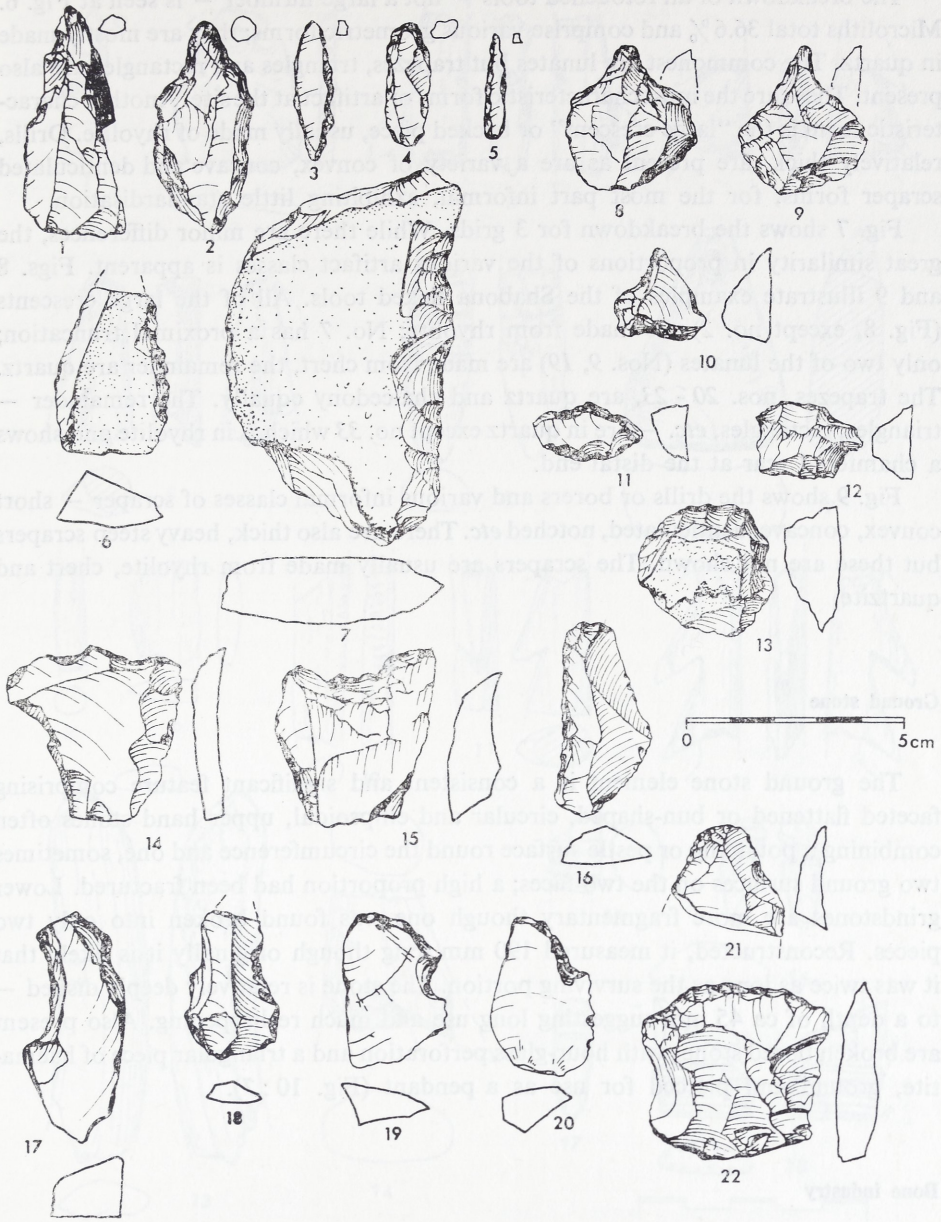

FIG. 9. Shabona. Borers and scrapers

1 - 5, 8 - 10: Borers; *6, 7*: Side scrapers; *11 - 13*: Short convex scrapers; *14, 15*: Denticulated scrapers; *16*: Side and end scraper; *17, 18*: Concave scrapers; *19, 20*: Notched scrapers; *21, 22*: End scrapers
1 - 3, 6, 9, 10, 12, 15, 19 - 21: Rhyolite; *4, 11, 14, 16, 18, 22*: Chert; *5, 8, 13*: Quartz; *7, 17*: Quartzite

The breakdown of all retouched tools – not a large number – is seen at Fig. 6. Microliths total 36.6% and comprise various geometric forms; they are mostly made in quartz. The commonest are lunates but trapezes, triangles and rectangles are also present. These are the most characteristic forms of artifact at the site. Another characteristic form is the "large crescent" or backed piece, usually made of rhyolite. Drills, relatively thick, are present as are a variety of convex, concave and denticulated scraper forms, for the most part informal, exhibiting little standardisation.

Fig. 7 shows the breakdown for 3 grids. While there are minor differences, the great similarity in proportions of the various artifact classes is apparent. Figs. 8 and 9 illustrate examples of the Shabona flaked tools. All of the large crescents (Fig. 8, except no. *2*) are made from rhyolite; No. *7* has a proximal truncation; only two of the lunates (Nos. *9*, *19*) are made from chert, the remainder are quartz. The trapezes, nos. *20* - *23*, are quartz and chalcedony equally. The remainder – triangles, rectangles, *etc.* – are in quartz except no. *33* which is in rhyolite and shows a chamfered scar at the distal end.

Fig. 9 shows the drills or borers and various informal classes of scraper – short convex, concave, denticulated, notched *etc.* There are also thick, heavy steep scrapers but these are not shown. The scrapers are usually made from rhyolite, chert and quartzite.

Ground stone

The ground stone element is a consistent and significant feature comprising faceted flattened or bun-shaped, circular and ellipsoidal, upper hand stones often combining a pounding or pestle surface round the circumference and one, sometimes two ground surfaces on the two faces; a high proportion had been fractured. Lower grindstones are more fragmentary though one was found broken into only two pieces. Reconstructed, it measured 190 mm long though originally it is likely that it was twice as long as the surviving portion. The stone is relatively deeply dished – to a depth of ca 45 mm suggesting long use and much resharpening. Also present are broken bored stones with hour-glass perforation and a triangular piece of haematite, ground and pierced for use as a pendant (Fig. 10 : *7*).

Bone industry

The above assemblage is typical of that associated with the Early Khartoum tradition and the same can be said of the bone industry, a sample of which is shown in Fig. 10. The characteristic, uniserial barbed bone points, all fragmentary from Shabona are present. These showed considerable variation in size from quite small

FIG. 10. Shabona. Bone tools

1: Tip of a polished bone point; *2*: Sub-triangular piece of bone with two, possibly three, holes at one end for suspension; *3 - 5, 11, 12, 14*: Mid-sections of uniserially barbed points; *7*: Ground and pierced haematite pendant; *8*: Mid-section of a ground and polished point; *9*: Bifacially ground and polished plaque fragment; *10*: Ground and notched fragment possibly a tally; *6, 15 - 17, 18(?)*: Proximal ends of uniserially barbed points; *13*: Flat *lissoir* with square notch cut into one edge

ones to very large ones (*e.g.* Fig. 10:14). The method of manufacture has been described elsewhere (de Heinzelin 1957; Robbins 1974; Caneva 1983). Proximal ends are mostly pointed to fit into a shaft and show the method of mounting with grooving for the stabilisation of binding and rope showing that these points were intended for use as the heads of harpoons. The special flattish grooved fragment (Fig. 10: *18*) might be the base of a very large example such as the one with a flat base and proximal rounding found in the first *Pila* pit. Other bone specimens include two segmented and polished bead fragments and a mid-shaft section of long bone of a medium bovid (a surface specimen from an adjacent site) having two bands of fine cross-hatching on the more convex face. Both ends are broken but, when in use, the specimen may have had these closed with greenhide sleeves to form a carrying case for small objects. The bone industry is completed by fragments of notched bone, awls or bodkins and a *lissoir*.

Pottery

An attribute analysis on some 2094 sherds of Shabona pottery from five localities was carried out by Steven Brandt and I am endebted to him for permission to quote from his unpublished report. As can be seen from Fig. 11, left, 76% of all sherds

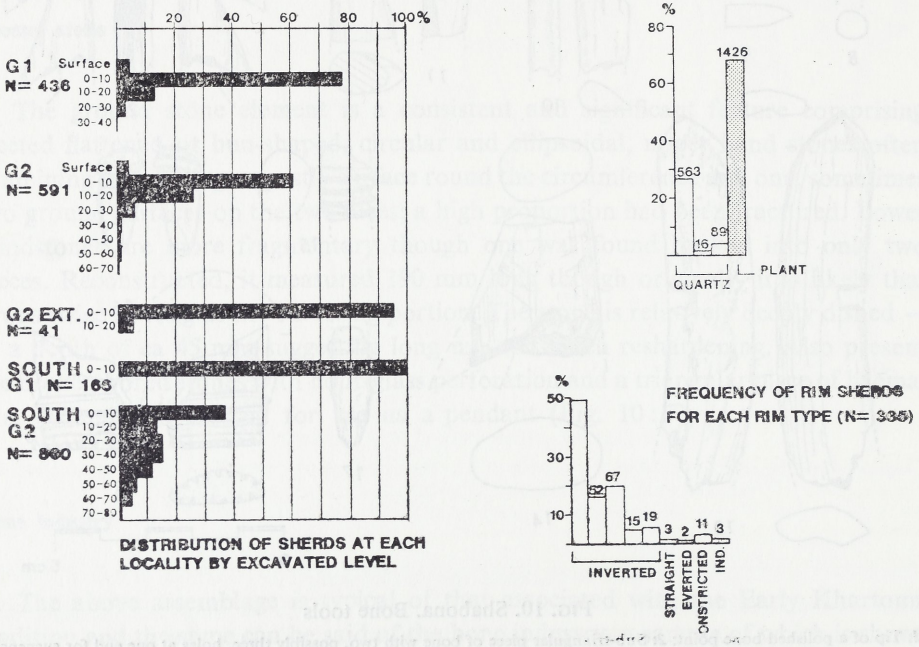

FIG. 11. Shabona. Histograms of sherd depth below surface, frequency of quartz and vegetable temper and frequency of rim sherd type

came from the surface to 20 cm. The exception to this was the assemblage from the possible hut floor found in SH/South/G2 and the two *Pila* pits at SH/Main/G2. The sample included body and rim sherds together with 15 secondarily modified pieces known as "pottery discs" – possibly gaming pieces – and 92 pieces of burnt clay. Evidence for pottery building by the coil method is shown by two sherds that have broken along the coil line. Irregularities on the sherd walls suggest also possible use of paddle-and-anvil technique for thinning and smoothing the pot walls.

Thin sections show two very distinct pastes – one in which the temper is composed of angular to sub-angular quartz grains and the other in which the temper consists primarily of coarse plant material. These two pastes have been called "quartz tempered" and "grass tempered". All sherds were unburnished but smoothed on both surfaces prior to decoration and firing. The quartz tempered sherds may have been "coated" sometimes with a red pigment. Indeed this may, perhaps, have been one of the uses for the iron oxide materials carried to the site. Sherds were unevenly fired but those with quartz temper showed more complete oxidation than the grass tempered pottery and were essentially harder. As can be seen from Fig. 11, there are appreciably more grass tempered sherds than those with quartz temper.

The vessel forms appear to have been large open-mouthed bowls or globular pots though no complete vessels were found. Mean body thickness for quartz tempered sherds is 9.5 mm, for grass tempered sherds 11.5 mm. There are eight main rim types: 5 are inverted with tapered, flattened, rounded, *etc.* lips, straight walled and everted rims are rare. 94% of the rims are inverted (Fig. 11, right). Decoration was done mostly with straight or convex combs, cord roulette and twisted cord, 87% of the total sample showed impressed decoration – straight impression, pivoted or rocked. Two other techniques occur: "dragged combing" and "jab and drag".

The usual decorative motifs and design forms found with Early Khartoum Tradition sites are represented in the proportions shown in Fig. 12. Quartz tempered sherds show a greater range of straight and dotted Wavy Line motifs, together with woven mat decoration. The grass tempered sherds, on the other hand, show a preponderance of only two dotted straight and Wavy Line motifs, a high percentage of the linear mat motif and small percentages of other designs, notably what we called "grub motif". Most decoration appears to consist of one design form that would have covered the whole pot.

The differences between the two pottery temper groups are clearly significant and Brandt has defined the wares. The quartz tempered ware which is the Dotted Wavy Line pottery of the Khartoum Tradition has been named Shabona Ware after the small village north of the site. The grass tempered ware is named Naima Ware after the village on the Qoz on the south side of the Shabona embayment (Fig. 13). Both wares occur at all excavated grids but Shabona Ware is the dominant one at SH/Main/G1 while Naima Ware dominates in one of the Main Site grids and at SH/South/G2. The main differences between the two wares are in temper, vessel thickness, hardness, porosity (29.7% for Naima and 12.6% for Shabona) and decora-

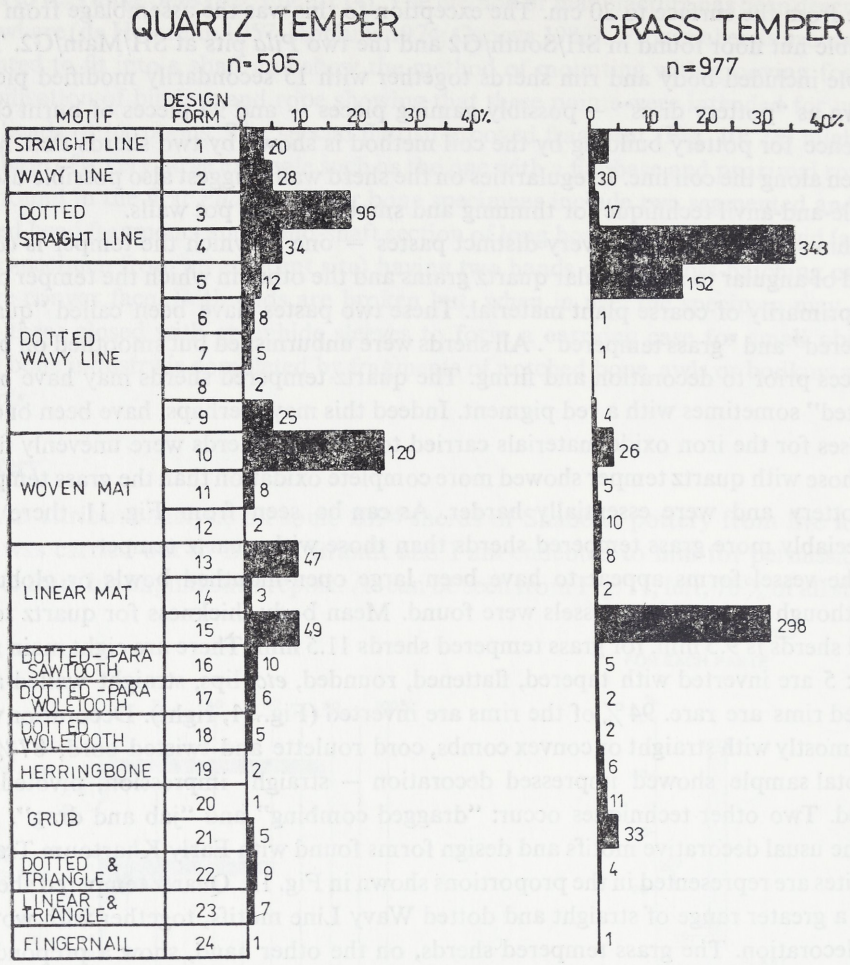

FIG. 12. Shabona. Histograms of frequency of design forms and associated motifs for each temper group (instead of , Woletooth" should be read „Wolftooth")

tion form. Shabona Ware is mainly comb impressed pottery (50% of the entire Shabona Ware sample) and only 17.4% cord impressed. The reverse is the case with Naima Ware where cord impressed sherds represent 75% of the total sample and comb impressed sherds only 11.5%;

The Shabona site is not going to provide the answer as to why these two wares are present and combine as they do. A number of factors could be involved – time, space, function, seasonality, group movement, style and diffusion, for example. There is some slight suggestion that Naima Ware is replaced at SH/Main/G1 by Shabona Ware

in the upper levels but it is not possible to be sure. Naima Ware is present at the Early Khartoum type site where Arkell called it "Crude Black-Fracture Basket-like Ware" (Arkell 1949: 88). It does not apparently occur at Saggai (Caneva 1983: 166) to the

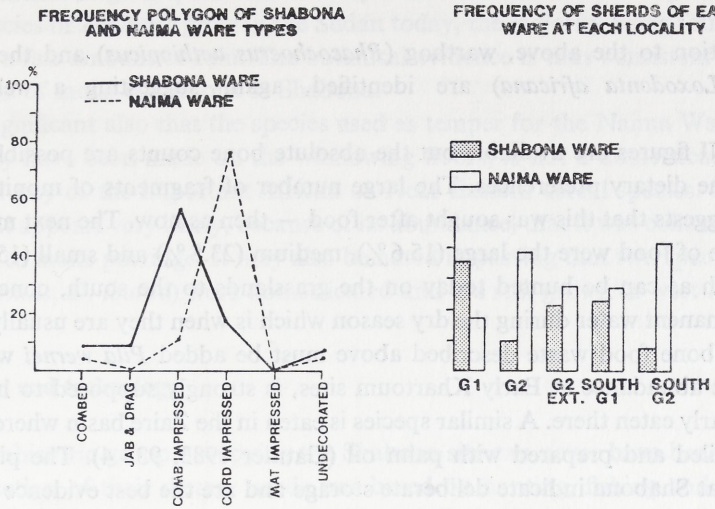

FIG. 13. Shabona. Frequencies of Shabona and Naima Ware sherds at each excavated locality and of decoration types

north of Khartoum and the possibility needs to be considered that the Khartoum area might have formed the boundary between two distinct pottery traditions. It will only be possible to narrow down the contributory factors when data from a number of excavated sites are compared.

Fauna

This has been identified by Andrew Smith. It consists of savanna and riverine animals at the present time associated with the richer habitats – grass plains and woodland savanna to the south.

The largest components of the fauna are the remains of numerous fish and tortoises, not yet specifically identified. With these are remains of *Hippopotamus*, *Varanus niloticus*, lizard, snake (*Mahelya* sp.) and crocodile, all of which emphasise the importance of the riverine resources. Rodents and carnivores are both represented as also is bird bone but these remains are, as yet, unidentified.

Savanna bovids are well represented. In the small bovid range is the oribi (*Ourebia ourebi*). Medium sized are reedbuck (*Redunca redunca*) that occupy grassland close to water and kob (*Kobus kob*): All of these were to be found in the grass plains and

never far from water. There is a possibility, however, that the larger reduncine teeth could belong to the Nile lechwe. A large antelope either roan (*Hippotragus equinus*) or waterbuck (*Kobus defassa*), probably the former, suggests the proximity of light woodland. The Cape buffalo, possibly the small sub-species, occupies both plains and forest.

In addition to the above, warthog (*Phacochoerus aethiopicus*) and the African elephant (*Loxodonta africana*) are identified, again suggesting a well watered terrain.

No MNI figures are available but the absolute bone counts are possibly indicators of some dietary preferences. The large number of fragments of monitor lizard (31.7%) suggests that this was sought after food – then as now. The next most common source of food were the large (15.6%), medium (23.8%) and small (15.8%) antelopes such as can be hunted today on the grasslands to the south, concentrating on the permanent water during the dry season which is when they are usually hunted.

To the bone food waste described above must be added *Pila wernei* which, because of its abundance at Early Khartoum sites, is strongly supposed to have been early regularly eaten there. A similar species is eaten in the Zaire basin where they use it twice boiled and prepared with palm oil (Gautier 1983: 93 - 4). The pits full of *Pila* shells at Shabona indicate deliberate storage and are the best evidence we know as yet to support the suggestion that the mollusc was regularly eaten by the Early Holocene population in the central Sudan. Boiling appears to be the best way to extract the snail from its shell and the use of pottery has obvious advantages here. An alternative way of preparation might have been to allow the *Pila* partially to decompose in the pits for easier preparation. *Pila* can be considered to be reasonably rich in protein.

Plant resources

Two sorts of plant remains were recovered. Plant fragments were obtained from using a frothing flotation technique on archaeological deposit from 0 - 20 cm below the surface; these were identified by Dr Jacques-Felix. Carbonised plant remains and plant impressions in potsherds were examined by Ann Stemler and Gerald Wickens.

Remains obtained by flotation do not show evidence of fossilisation and are mostly of arid species existing in the area today. These findings do not accord with the faunal and geomorphological evidence from the site and imply that the remains have worked their way down from the surface in recent times. Moreover, species in the flotation samples do not occur in the Naima Ware temper.

The 59 sherds examined by Ann Stemler showed clearly that grass was used as an organic temper. There is a remarkable uniformity in the dimensions of carbonised grains suggesting that all or most of the organic temper used could have come from a

single species of grass. The morphology suggests that the specimens belong to the grass sub-family *Panicoideae*. The grains are the wrong shape for *Eragrostis tef* or *Eleusine corocana* and it is likely that some species of the genus *Digitaria* is involved since the archaeological specimens are very similar in dimension to *Digitaria velutina*. Many species of *Digitaria* grow in the Sudan today, the majority being found in areas receiving a fair amount of rain. The botanical evidence is thus consistent with other indications of moist conditions at Shabona.

It is significant also that the species used as temper for the Naima Ware pottery, which may have been made on the winnowing floors, is not a domesticated or wild relative of any of the important African or Near Eastern cereal species. It is a wild grass but it appears very likely, because of its abundance, that it was collected to grind into flour to make porridge. It may also be noted in passing that two species of *Digitaria* (*D. exilis*, *D. iburua*) were domesticated and are still grown in west Africa.

Economics and technology

The prehistoric group occupying the Shabona site can never have been large and the satisfaction of their dietary needs was based on hunting, fishing and collecting. The shallow nature of the site and variable weathering patterns on the bone imply seasonal occupation as does the fact that the site would almost certainly have been subject to some degree of annual flooding. There is every reason to suppose that the pattern of occupation was similar to that seen today among ethnic groups such as the Nilotic peoples on the Upper Nile to the south. These groups occupy country that the evidence suggests is comparable to that of Shabona at the time it was occupied in the early 6th millennium B. C.

The seasonal activities and movements of these people (*e.g.* Evans-Pritchard 1940), the collecting habits of nomadic pastoralists such as the Zaghawa (Tubiana and Tubiana 1977), and those of the ethnic groups occupying the Gezira before the installation of the irrigation system (Tothill 1948: 770) may best be used as a basis from which to construct a model for seasonal movements and foods of the prehistoric settlement.

Their material culture was well adpated to allowing maximum use of the different habitats from the locality. To mention the most important: harpoons used for fish and aquatic animals would have been equally appropriate for hunting the plains animals. The manner of use is likely to have been similar to that employed by the Nuer, the Elmolo of Lake Turkana and the Kwegu hunting peoples in the Omo valley today who use the harpoon for catching Nile perch (David Turton, pers. com.).

Geometric microliths suggest use as the barbs of spears and/or the cutting heads of arrows. In particular, it may be suggested that the deep crescents and trapezes would have been hafted as some kind of chisel-ended spear or harpoon. Such a weapon as that is shown being used in the statuette of Tutankhamen harpooning hippopota-

mus, although this has a metal head (Desroches-Noblecourt 1965: Pl. XXV) and was described by Diodorus for hunting hippo "...caught by the united work of many men who strike it with iron spears... wound it repeatedly with a kind of chisel fitted with iron barbs..." (I, 35: 10 - 11; Darby *et al.* 1977: 257). Since most of the large backed and trapeze forms are made from rhyolite, it is possible that this was a sharper, harder and less brittle material for making the cutting head than quartz and so would be more efficient for this dangerous work.

The other important class of equipment are the grindstones and it is clear that wild plant products were an important source of food. Besides grains, fruits and kernels, *Typha* roots and flowers, *Cyperus* roots, waterlily bulbs, tubers, melons, gums, all would have been important in season and would have been made into flour by grinding and cooked with ashes in a shallow hole in the ground as do the Zaghawa (Tubiana and Tubiana 1977: 13 - 28). Termites and honey in season are also certain foods, as among the Azande today (Culwick 1950: 40). The advantages of pottery can be clearly seen and there is every reason to consider the Early Khartoum wares as having been independently invented, an outcome of the need for improved preparation of fish, perhaps, besides drying, to process by pounding and boiling into dried "cakes" as did the Ichthyophagi (Darby *et al.* 1977: 309), to boil to remove the oil as do

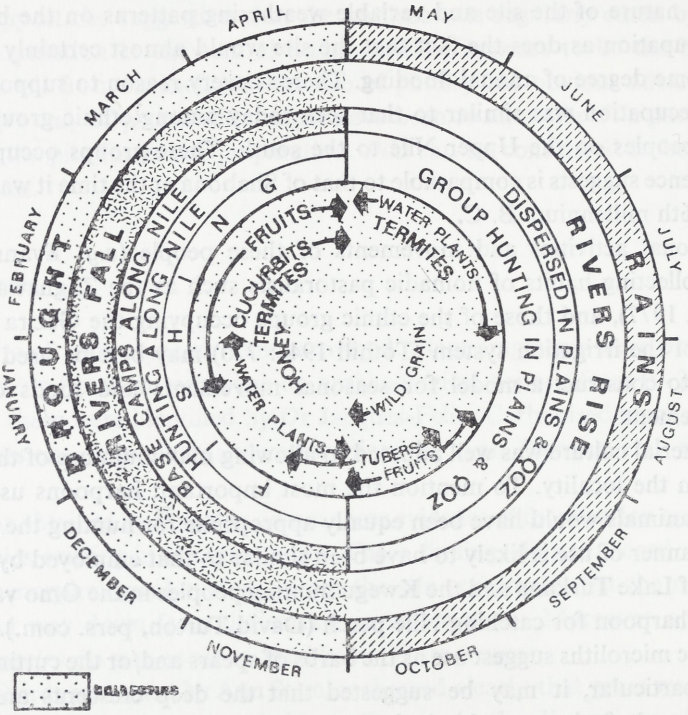

FIG. 14. A model for Early Holocene hunter-gatherer subsistence and seasonal movement in the Central Sudan

the Bozo in the Niger inland delta area (Ligers 1964 I: Plate IX), or in the preparation of *Pila.*

The model at Fig. 14 is based on the ethnographic sources referred to above and the archaeological data (Clark 1984). Only further research will show how close to or how far from the truth it is as an explanation of the way the prehistoric hunting/gathering Sudanese Negroes ordered their lives.

The year is divided into two main parts – the dry season, a time of drought, and the rains. Shabona would have been occupied during the dry season as the flood waters were beginning to recede. Dwellings would have been of reeds plastered with mud. Creeks would have been dammed and fish caught with spears and, possibly, basket traps or simply by reducing oxygen in the water by trampling the mud and so stupifying the fish. Crocodiles and hippos and also elephant were taken from time to time. *Pila* would have been dug out of the mud into which they had burrowed. As bovids began to collect round the permanent water so hunting in the grasslands and *toich* country became more important. Vegetable foods consisted of water plants, cucurbits, fruits and honey collected at the end of the dry season. With the rains, the rise of the Nile and flooding in the *toich* country, the inhabitants of the Shabona base camp would disperse into the hinterland where they would exist by hunting supplemented by using termites and water plants. Most important was the wild grain harvest towards the close of the rains and this would have been collected by the women. Fruits and tubers also became plentiful at this time as the population collected again at Shabona with the onset of the new dry season.

We need a lot more factual evidence before this can become more than a working hypothesis but, if nothing else, it is a base from which to examine more critically what we do know and to plan how and where we can add to this knowledge.

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