

# The Prehistory of the Central Nile Valley as Seen from Its Eastern Hinterlands: Excavations at Shaqadud, Sudan

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*Excavations at the midden and cave complex of Shaqadud in the savannah 50 km east of the Nile Valley, Central Sudan, have documented an almost continuous sequence of occupations from 7500 B.P. to 3500 B.P. Although until about 4000 B.P. these occupations have correlates in the Nile Valley, it is clear that at Shaqadud people had adapted primarily to grasslands and were not merely Nilotic folk exploiting the savannah after the summer rains, as has been postulated. Surprisingly, during the equivalent of the Khartoum Neolithic occupation there is no evidence for domestic animals, which were then common in the Nile Valley. By 4000 B.P. there is some evidence for domestic plants and animals, but until 3500 B.P. hunting remained vitally important.*

## Introduction

Although serious archaeological investigations in the Nile Valley of the central Sudan began over 60 years ago and have continued with some regularity ever since,<sup>1</sup> the cultural sequence for this 500-km stretch of river valley is still curiously episodic. In spite of recent systematic surveys carried out by the University of Khar-

toum, there are still significant periods during the Holocene when there is almost no evidence for human presence in this portion of the Nile Valley. The earliest evidence for a post-Pleistocene occupation comes from a series of sites that extends from Kosti, 300 km south of Khartoum, to around Shendi, 200 km north of Khartoum (FIG. 1), and is dated to the mid-Holocene. These sites all contain ceramics broadly of the type described by Arkell as belonging to the Khartoum Mesolithic<sup>2</sup> and at all these sites there is evidence for only hunting and

1. Among major publications on early work in the central Sudan are J. Garstang, *Meroë, the City of the Ethiopians* (Oxford University Press: Oxford 1911) and F. Addison, *The Welcome Excavations in the Sudan: Jebel Moya* (Oxford University Press: Oxford 1949). *Kush*, the Journal of the Sudan Antiquities Service, contains many articles through 1968, as does *Nyame Akuma*, the Newsletter of the Society of African Archaeologists in America, for the most recent work (1974- ).

2. A. J. Arkell, *Early Khartoum* (Oxford University Press: Oxford 1949) 81-95. The term Khartoum Mesolithic was certainly unfortunate, but the term Early Khartoum for the same cultural manifestation is no better. The former is used here because it is well known in the literature of the region.

gathering, with an emphasis upon riverine resources.<sup>3</sup>

3. J. Sutton, "The Aquatic Civilization of Middle Africa," *Journal of African History* 15 (1974) 527-546; I. Caneva, *Pottery Using Gatherers and Hunters at Saqqai (Sudan): Preconditions for Food Production. Estratto dalla Origini*, vol. XII (Rome 1983) 261-264.

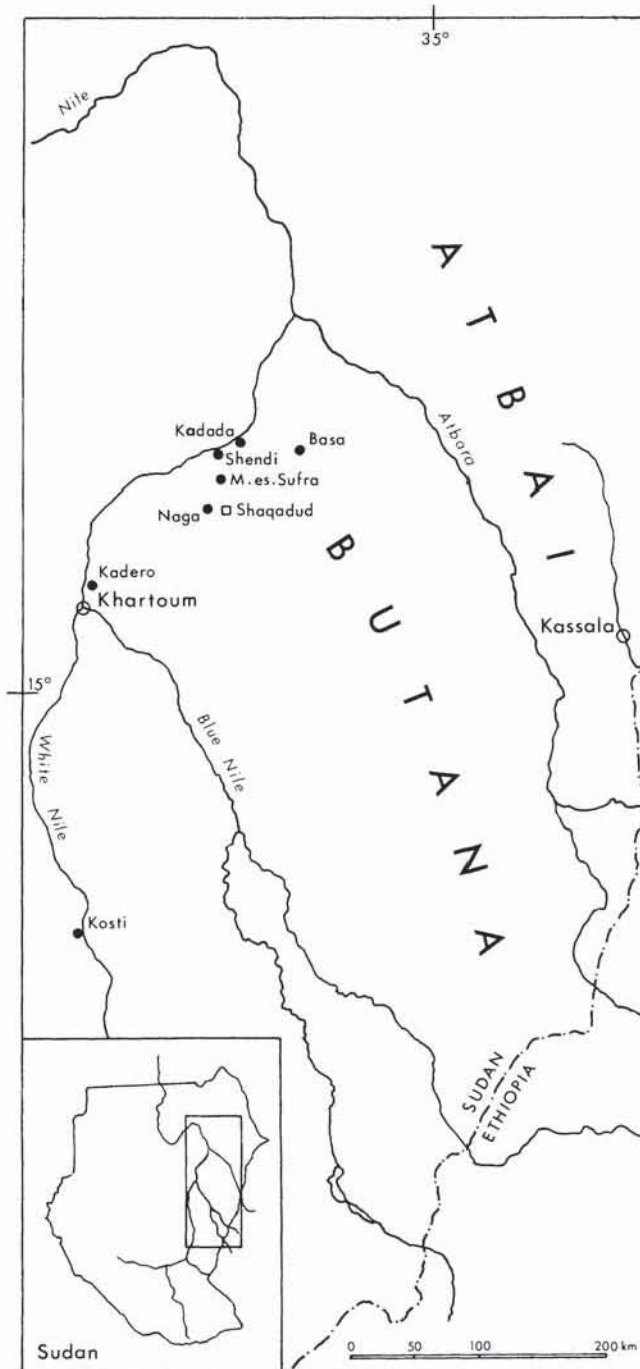


Figure 1. Map of the central Nile Valley, showing location of the sites mentioned in the text.

Although only a few radiocarbon dates of an early occupation are available, they indicate its appearance in the central Nile Valley between ca. 9600 B.P. and 8000 B.P., most sites dating between 8000 B.P. and 6000 B.P. (FIG. 2). Thus, there is no evidence for occupation during the initial Holocene or, for that matter, for any preceramic, late Pleistocene industry that might have been the progenitor of the Khartoum Mesolithic.

While it is commonly held that the Khartoum Mesolithic developed directly into the Khartoum Neolithic because of the obvious continuation of certain motifs and techniques used in pottery decoration,<sup>4</sup> until this year the paucity of Khartoum Mesolithic radiocarbon dates indicated an apparent hiatus of some 2,000 years between it and the well dated Khartoum Neolithic (FIG. 2). The Khartoum Neolithic seems to have lasted no more than 600 years in the central Nile Valley, from 5600 B.P. to 5000 B.P. During that time cattle and small livestock were introduced and rapidly adopted, so that by 5250 B.P. at Kadero I almost all of the animals exploited were domestic but, while a wide range of plants was also exploited, none of the latter was domesticated.<sup>5</sup> What happened to the Khartoum Neolithic is unknown. A very few sites near Shendi, including Kadada, suggest continuity, and Kadada is dated ca. 200 years later than the "classic" Khartoum Neolithic (FIG. 2). While not typical of the Khartoum Neolithic, its ceramics are within that tradition.<sup>6</sup> Yet the drop in the number of sites along the central Nile from over 30+ known Khartoum Neolithic sites to a mere handful around Kadada is striking, particularly since Khartoum Neolithic sites are often large (up to 40,000 sq m) and have moderately deep cultural deposits (up to 70 cm), which circumstances argue for a sizable resident population.

Aside from Kadada, which is still temporally and culturally linked to the Khartoum Neolithic, there is no evidence for any significant occupation of the central Nile Valley from ca. 4800 B.P. until ca. 2600 B.P., when Meroe developed as a large town prior to becoming the capital of the Kushite state.<sup>7</sup> Even assuming that addi-

4. A. J. Arkell, *Shaheinab* (Oxford University Press: Oxford 1953) 68-81; D. Phillipson, "Early Food Production in Sub-Saharan Africa," in J. D. Clark, ed., *The Cambridge History of Africa* 1 (Cambridge University Press: Cambridge 1982) 794-797.

5. R. Haaland, *Migratory Herdsmen and Cultivating Women. The Structure of Neolithic Adaptation in the Khartoum Nile Environment* (Bergen 1981).

6. F. Geus, *Rapport Annuel d'Activite (1978-79 and 1979-80)*, Directorate General for Antiquities and National Museums of the Sudan: French Archaeological Research Unit (Khartoum 1980, 1981).

7. P. Shinnie, *Meroe: A Civilization of the Sudan. Ancient Peoples and Places* 55 (Praeger: New York 1955). Survey by I. Caneva, University of Rome, this past December located two post-Kadada

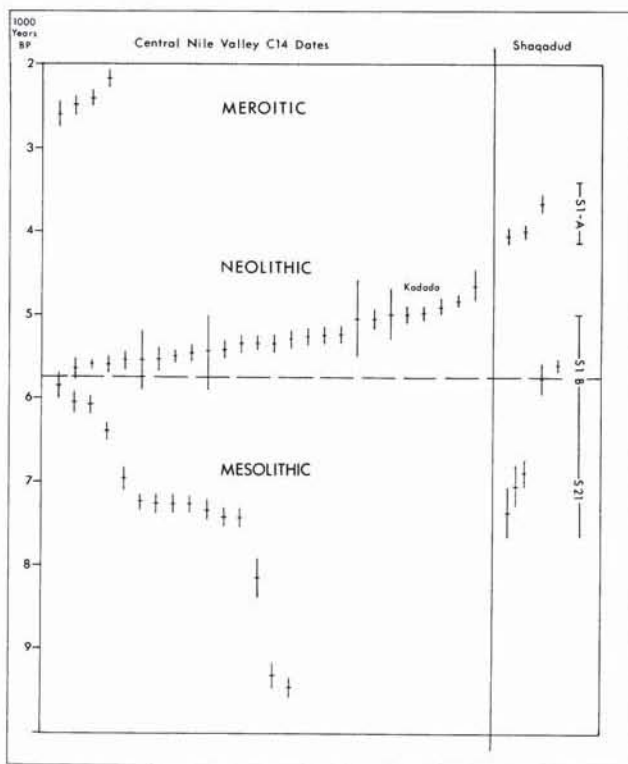


Figure 2. Radiocarbon dates for central Nilotic sites, indicating a clear hiatus between the Khartoum Neolithic and the Meroitic. The right side shows those radiocarbon dates now available from Shaqadud, as well as the localities from which they come. The dashed horizontal line indicates the probable time of the transition from the Khartoum Mesolithic to Neolithic. Dates are given as B.P., uncalibrated.

tional radiocarbon dates may push the epi-Khartoum Neolithic at Kadada somewhat forward in time and that the opposite may happen at Meroe, we are still faced with a 2,000-year hiatus into which we reasonably can place neither dated nor even undated cultural materials.

Thus, from the early Holocene to the middle of the 1st millennium B.C. there is considerable time when the central Nile Valley was seemingly unoccupied. These apparent hiatuses pose a number of serious problems for the interpretation of local cultural development. Since it is held that the Khartoum Neolithic developed out of the Khartoum Mesolithic, the almost 2,000-year gap between dated occurrences of each was perplexing, at best, while the seeming abandonment of the central Nile Valley for another 2,000-year period, from ca. 4800 B.P. to 2600 B.P., has not yet been explained. Perhaps because

camp sites in the Nile Valley but with ceramics unlike any now known.

of this, these gaps are rarely mentioned explicitly in the literature of the region.<sup>8</sup>

The apparent occupational hiatus in the late Neolithic may in part be the result of a traditional geographic focus of archaeological investigations that was limited to the Nile Valley; in fact, investigators tended to define the central Sudan as being archaeologically restricted, a priori, to the valley itself and to dismiss its hinterlands as barren of significant cultural development. Such a position, valid for Nubia and Egypt,<sup>9</sup> was seemingly accepted for the central Sudan without careful consideration. This mind set, as well as difficult local logistics, severely limited consideration of the surrounding steppe as part of a larger adaptive zone. The presence of Meroitic monuments at Naga, Basa, and Musawwarat es-Sufra in the grasslands of the Butana, to the east of the Nile Valley (FIG. 1), did generate excavations, and problems relating to Meroitic studies did bring about a few brief surveys in the western Butana, but even Meroitists see most serious cultural development as being linked to the Nile.<sup>10</sup> The situation to the west of the Nile Valley is even bleaker: virtually nothing is known archaeologically between the western valley edge and the Wadi Hawar, some 1,000 km to the west.<sup>11</sup>

A single exception to this picture, as it relates to pre-Meroitic periods, is the site of Shaqadud, located some 50 km into the Butana and 13 km east of the Meroitic site of Naga (FIG. 1). Originally shown to the Humbolt University Butana Survey in 1961, it was briefly tested by that group the following year and preliminary reports were published shortly thereafter.<sup>12</sup> It was described as a Khartoum Neolithic site of some considerable size and complexity. It was viewed as potentially important because of its location away from the Nile Valley, but both logistics and political realities of the 1960s discouraged additional work. In spite of the limited nature of the testing and the resulting publications, Shaqadud was held as an example of a seasonal cattle camp, occupied during

8. A. Mohammed-Ali, "Sorourab I: A Neolithic Site in Khartoum Province, Sudan," *CA* 25:1 (1984) 117-119.

9. W. Adams, *Nubia: Corridor to Africa* (Allen Lane: London 1977); M. Hoffman, *The Predynastic of Hierakonpolis—An Interim Report*. *Egyptian Studies Association Publication* 1 (Cairo 1982).

10. F. Hintze, "Vorbericht über die Butana-Expedition 1958 des Instituts für Ägyptologie der Humbolt-Universität zu Berlin," *Forschen und Wirken, Festschrift aus 150 Jahr* 3 (Berlin 1960) 361-399; Garstang, op. cit. (in note 1); Shinnie, op. cit. (in note 7).

11. A. Mohammed-Ali, "Archaeological Survey in the Wadi Hawar Basin," *CA* 22:2 (1981) 176-178.

12. K. Otto, "Shaqadud: A New Khartoum Neolithic Site outside the Nile Valley," *Kush* XI (1963) 108-116; idem, "Khartoum-Neolithikum am Jebel Shaqadud," *Schriften der Sektion für Vor- und Frühgeschichte* 16 (1964) 9-14.

Figure 3. Landsat photo of the Shaqadud area, showing a portion of the Nile Valley in the upper left. Shaqadud is circled in the center. Note the large wadi and its catchment area near Shaqadud.



and after the rainy season when the grasslands of the Butana would have been optimal for the grazing of herds of cattle belonging to the occupants of the Nile Valley.<sup>13</sup> In short, the site was incorporated into a traditional model of an essentially Neolithic riverine adaptation, with the Butana seen as an environmentally marginal zone that could be exploited only seasonally, and then for limited resources.

The site of Shaqadud is of much greater significance than was originally thought. Its importance was only recently recognized, a result of renewed studies there that are part of a much larger investigation of the archaeology of the eastern Sahel. Using Shaqadud and the area around it as a sample zone from the western Butana, the site, which is really a complex of occupations, was surveyed and test excavations were carried out over two field seasons in 1981/82 and 1982/83 by the Joint University of Khartoum/Southern Methodist University Butana Archaeological Project.<sup>14</sup> The result of these ex-

13. Haaland, op. cit. (in note 5) and R. Haaland, "Seasonality and Division of Labor: A Case Study from Neolithic Sites in the Khartoum Nile Environment," *Norwegian Archaeological Review* 14:1 (1981) 44–59.

14. This project has been funded for a two-year period by National Science Foundation Grant BNS 8102649 to the senior author with additional support from the University of Khartoum. The excavations reported here were carried out mainly under the field supervision of Dr. T. R. Hays, one of the four principal investigators, who also included Drs. A. E. Marks, A. Mohammed-Ali, and Y. Elamin.

cavations and Shaqadud's significance, both to the archaeology of the central Nile Valley and to the archaeological potential of the steppe to the east of the Nile Valley, form the basis of this interim report.

### The Setting

Shaqadud is located in a tiny box canyon at the southern end of an irregular, elongate sandstone outcrop that is some 50 km east of the Nile Valley. Between this outcrop and the Nile Valley is a wide, shallow wadi system draining to the north and separated from the Nile by low, undulating, gravel-covered hills cut by small wadis with thin lines of *Acacia* along their sides (FIG. 3). Local summer rainfall averages 150 mm per year; after the rains the area has a rich grass cover. There is a small resident population, engaging in rainfall farming and livestock herding. Most of the year they rely on deep wells to supply water for themselves and their animals. It is, at best, a marginal environment, quite like that perceived for it during the Khartoum Neolithic.

The box canyon and its immediate surroundings hold what can be considered four different sites (FIG. 4). Set into the back of the box canyon is a wide cave (S1-A). Directly in front of the cave is a small basin mainly of old pond sediments and colluvial fill. This basin is sur-

Preliminary notes on the work may be found in *Nyame Akuma*, op. cit. (in note 1).

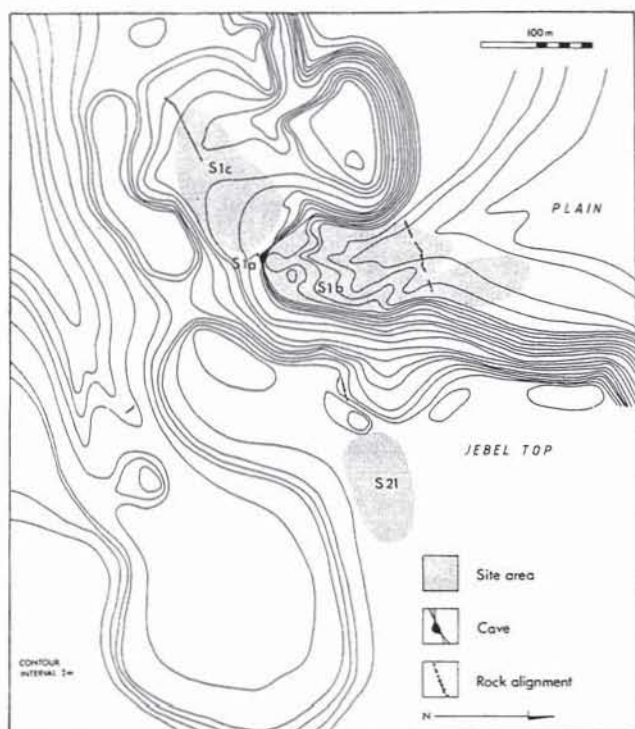


Figure 4. Topographic map of the box canyon at Shaqadud and immediately surrounding surfaces, showing the four main prehistoric occupation areas. The lines of small black dots are walls of unknown age; they are probably Neolithic.

rounded on the north by midden deposits that rise 2 m above its present floor. Aside from an apparently rather recent erosional cut from the basin through the midden, the basin itself is isolated by surrounding cliff faces and midden (FIG. 5). The midden itself (S1-B) is large, ca. 15,000 sq m, and extends across the whole of the box canyon, as well as for 240 m out along it. As the midden extends northward, its depth decreases from over 3 m to less than 20 cm at the mouth of the canyon as the effects of erosion and deflation become more pronounced. There is a thin scatter of washed artifacts, forming a large apron in front of the box canyon, but true occupation along the base of the sandstone outcrop appears limited to within the canyon. On the flat surface 9 m above the cave there is a 9,000 sq m area of shallow, in situ artifact distribution (S1-C) and another (S21) a short distance to the east of the western rim of the box canyon (FIG. 4). Each of these can be spatially delineated, although the temporal and functional relationships between them are only partly defined. This number of prehistoric occurrences in one location appears unusual in the Butana and may reflect the advantageous spatial association of good quality sandstone for grinding stones, quartz and quartz-

ite for chipped-stone tools, a sheltered setting, and, most important, a source of predictable surface water.

On the basis of various test excavations, as well as radiocarbon dates, a site chronology can be established (FIG. 2). The initial occupation of the immediate area was at S21, along with at least parts of the main midden (S1-B). Then, after the abandonment of S21, while the main midden continued to see occupation, the area above the cave (S1-C) was also inhabited. Somewhat later, after a temporal hiatus during which the area seemingly was not occupied, people returned but restricted the habitation area to the back part of the box canyon, to the edges of the basin in front of the cave, and to the cave itself. At that time, at least, the basin contained a pool of water separated from the cave by a significant rock fall. As the pool level rose, the cave itself became the focal point of occupation, since the basin appears to have been flooded, at least during the rainy season. Finally, the sediment deposition in the cave left too little room for comfortable inhabitation and the whole box canyon was abandoned. Based upon radiocarbon dates and using ceramics for cross-dating, it now seems certain that the Shaqadud site complex temporally encompasses major periods between ca. 8000 B.P. and 3600 B.P. (FIG. 2). It is the longest known sequence at any site for the Holocene prehistory of the Sudan.

### The Culture Sequence

Most of the various assemblages sampled from the different occupations at Shaqadud may be broadly classified into already named Nilotic prehistoric periods (FIG. 2). This classification, however, should be taken only in the most general sense, since the details of the Shaqadud assemblages point to distinct local facies within these more loosely defined periods, such as Khartoum Mesolithic or Khartoum Neolithic. On the other hand, some of the assemblages, particularly those from the basin and cave, are, as yet, undefined for the Nile Valley, although not totally unknown.<sup>15</sup>

At site S21, on the sandstone plateau just east of the box canyon, most of the fine-grained deposits have long since been deflated and the site consists of faunal materials, chipped- and ground-stone artifacts, and ceramics, all within a 40 cm deep matrix of small quartz pebbles and coarse reddish sand, both weathered in situ from the underlying sandstone bedrock. The ceramics are clearly of Khartoum Mesolithic type: unslipped and unburnished, with combed wavy-line motifs, rocker-stamped zigzag impressions, or, for many, without decoration. The flaked-stone tool assemblage is mainly of

15. Geus, *op. cit.* (in note 6).

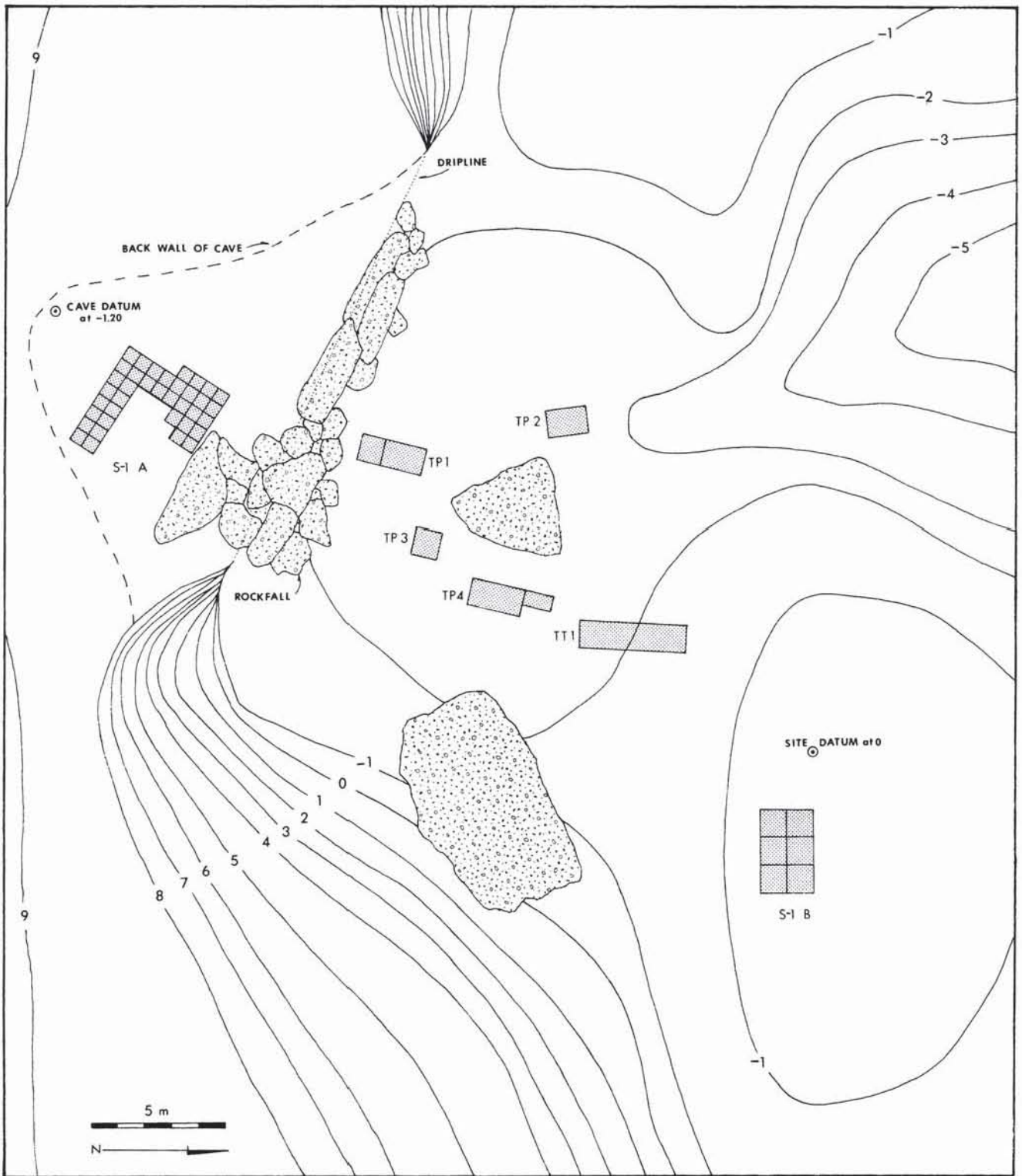


Figure 5. Topographic map of the back of the box canyon, showing the positions of the various test excavations in the mid-den, basin, and cave.

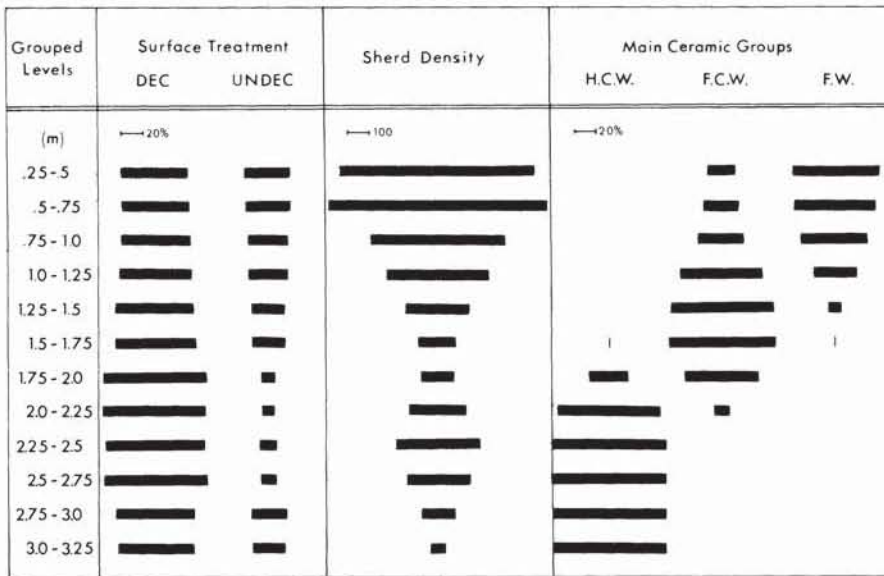


Figure 6. Data from the midden relating to ceramics. The left column shows the proportions of decorated and undecorated sherds, the center column shows the sherd counts, and the right column shows the stratigraphic relationship among the three main groups of ceramics: H.C.W., hard coarse ware; F.C.W., friable coarse ware; and F.W., fine ware. Each section is shown for collapsed, 25-cm deep stratigraphic units. The start of the Khartoum Neolithic begins with the 1.0–1.25 m level.

quartz and consists of microlithic elements, mostly geometrics and simple retouched flakes. Ground stone is ubiquitous with a rather even distribution between hand stones and extensively utilized milling stone fragments. Although no macrobotanical materials were recovered, the large number of worn-out milling stones points to considerable plant processing.

The faunal remains from site S21 suggest that hunting was important and that it was pursued actively and intensively. A wide range of animals was hunted, from very small oribi to elephants, although small antelopes seem to have been most regularly taken.

Evidence for specific Nile Valley contacts is limited to a very few pieces of Nile pebble and a few fragments of Nile bivalve (*Aspatharia* sp.); otherwise, all objects are of local origin.

At about the same time that site S21 was being inhabited, a very ephemeral occupation of the box canyon is attested to by a thin scatter of sherds, chipped stone, and ground stone that is mixed in with the crumbling sandstone slabs, sands, and quartz pebbles that were accumulating at the bottom of the canyon from both in situ weathering and scree coming off the canyon walls. This cultural material is the earliest in the midden (found below 3.0 m) and the ceramics correlate well with those from site S21.

It appears that the locus of occupation shifted from the top of the canyon to within it, because as the deposits accumulated on the floor of the canyon, there was a marked increase in the amount of cultural items mixed in with them, particularly ceramics (FIG. 6). The presence of charcoal, delicate animal bones, and large conjoinable

sherds together affirms that these cultural materials are in primary context. This occupation of the Khartoum Mesolithic type can be traced, without a break, through the lowest 1.10 m of the midden deposits. The ceramics, which are first seen sporadically at a depth of 3.10 m, just above bedrock, reach a maximum density at a depth of 2.25–2.50 m and then thin out upwards until a new minimum density is reached at a depth of 1.75–2.00 m (FIG. 6). In spite of these changes, all the ceramics are of the same kind: very hard, with crushed quartz temper, and with unslipped, only slightly smoothed surfaces of brownish to grayish colors. Both decorated and undecorated sherds are found, although those decorated outnumber undecorated ones by at least two to one (FIG. 6). Decorations appear to be formed mainly with three techniques: simple impressions, combing, and rocker stamping. A very few sherds, however, indicate decoration by a stylus or a twine-wrapped stick (FIG. 7i). Impressed decorations include closely packed comb impressions, which look rather like a rough woven mat (FIG. 7a), or widely spaced cord impressions (FIG. 7b). The combed decorations are formed by dragging and are restricted to various varieties of a “wavy-line” motif (FIG. 7e). The rocker-stamped designs are variations of continuous “zigzag” lines always dotted (made with a toothed rocker stamp), a motif also referred to as “wolf tooth” or “saw tooth.”<sup>16</sup>

While a number of techniques were used and motifs found, they are not randomly distributed stratigraphically.

16. T. R. Hays, “Wavyline Pottery: An Element of Nilotic Diffusion,” *SAfArchBull* 29 (1974) 27–32.

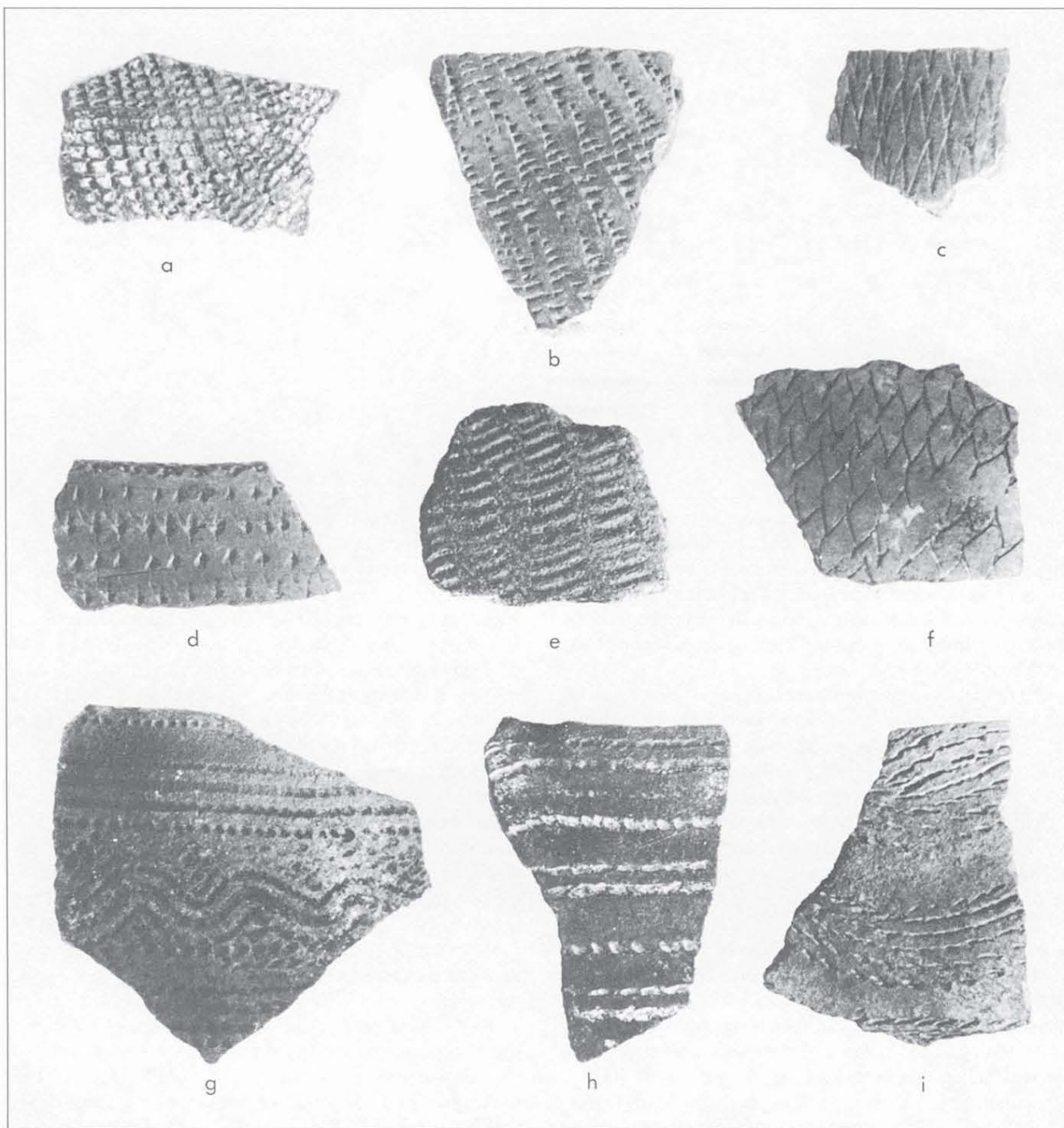


Figure 7. Ceramics from Shaqadud midden. Khartoum Mesolithic: a, woven mat; e, wavy line; g, dotted wavy line; h, banded; i, varia. Khartoum Neolithic: b, burnished dotted zigzag; c, burnished lined zigzag; d, burnished triangles and "vees"; f, burnished net pattern.

cally. In fact, they show a remarkably good seriation (FIG. 8) and it is obvious that the motif changes were gradual and consistent, suggesting a continuity of occupation and occupants.

These lower levels, below 1.75 m, are poor in chipped stone; in the lowest 50 cm only 65 tools were recovered. Not only are they few in number but there is relatively little variability among them. The most common tool is



Depth (m)	WL	DWL	Banded	M	DSL	DZ	Z	Δ/V	S:2	Varia	Sample Size	Dates BP
.25-5					■	■	■	■			1268	
.5-75				■	■	■	■	■			1475	
.75-1.0				■	■	■	■	■			927	5,582±74
1.0-1.25				■	■	■	■				730	
1.25-1.5				■	■	■	■				471	5,766±101
1.5-1.75				■	■	■	■				269	
1.75-2.0			■	■	■	■	■				257	
2.0-2.25			■	■	■	■	■				545	
2.25-2.5			■	■	■	■	■				763	6,893±131
2.5-2.75			■	■	■	■	■				580	
2.75-3.0	■		■	■	■	■	■				192	7,369±393
3.0-3.15	■			■		■					66	

Figure 8. Seriation of midden ceramics by motif (not types). Key: WL, wavy line; DWL, dotted wavy line; DSL, dotted straight line; DZ, dotted zigzag; Z, lined zigzag; Δ/V, triangle and "vee" patterns; S:2, multiple straight line. Samples are grouped into 25-cm stratigraphic levels. The Khartoum Neolithic begins at the base of the 1.0-1.25 m level.

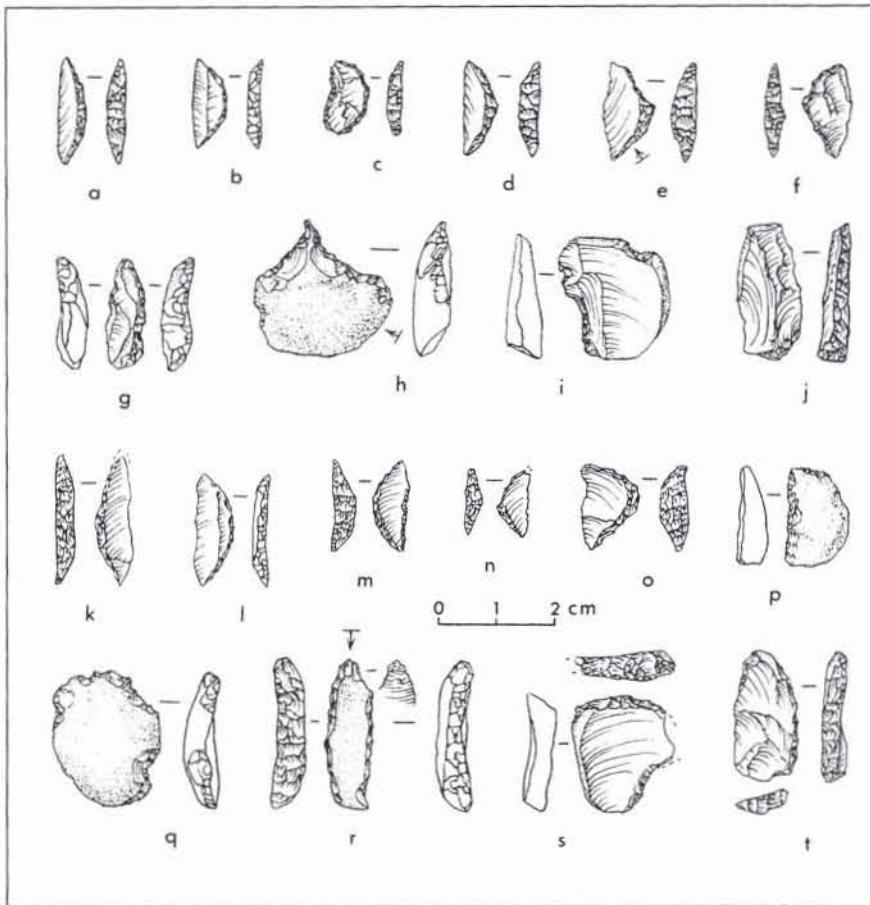


Figure 9. Chipped-stone tools from both the midden and cave. Midden: a-f, geometrics; g-h, perforators; i, notched flake; j, backed piece. Cave: k-o, geometrics; p, retouched piece; q, denticulated flake; r, perforator; s, endscraper; t, backed piece.

the lunate, often poorly made, followed by simple retouched pieces, denticulates, and notches, but with a small number of tools that called for more exacting retouch, such as perforators, backed pieces, etc. (FIG. 9).

Most striking is the paucity of cherts, rhyolites, and agates which are of Nilotic provenience. In fact, fewer than a dozen such pieces were found, including debitage, and all the remaining tools and waste products are made

Figure 10. Main classes of chipped-stone tools from the midden and cave by grouped levels based on changes in ceramics.

Grouped Levels	Triangles	Lunates	Transverse Arrows	Beaked Pieces	Truncations	Borers	Denticulates Notches	Scrapers	Burins	Continuously Ret. Pieces	Discontin. Ret. Pieces	Scaled Pieces	Becs	Varia	Sample
(m)	←10% Cave														
.6-1.2		■			■	■	■			■	■				182
1.2-1.6		■				■	■			■	■				320
1.6-2.1		■		■		■	■	■		■	■				390
2.1-2.5		■				■	■			■	■	■			273
2.5-3.0		■				■	■	■		■	■	■			227
3.0-3.7		■			■	■	■	■		■	■	■			175
	Midden														
0-2		■		■	■	■	■	■		■	■				73
2-1.25		■		■		■	■	■		■	■				247
1.25-2.0		■		■	■	■	■	■		■	■				71
2.0-2.6		■		■	■	■	■			■	■				129
2.6-3.1		■		■	■	■	■	■		■	■				65

of locally available rocks, primarily quartz or quartzite, although small amounts of both fossil wood and Hudi chert are present. Aside from the few pieces of raw material of Nilotic origin, only fragments of the shells of *Caelatura* sp. and *Aspatharia* sp. show direct contact with the Nile Valley.

At ca. 2.0 m below the surface of the midden there is an abrupt change in the nature of the ceramics. The thick, simple, hard sherds give way, within a 15-cm stratigraphic depth, to sherds that are similarly thick with unslipped and unburnished surfaces, but are now sand tempered and are soft and friable (FIG. 6). Given the loose packing of the midden sediments and a presumed vertical artifact movement of at least 10 cm up or down,<sup>17</sup> this change must be considered a revolutionary one for ceramic technology, the kind that might suggest a replacement of one population by another. There is, however, no discontinuity to be seen in the slow, steady shifts of motifs that seriate so well throughout the stratigraphic sequence (FIG. 8). It is particularly striking that the cord-marked, banded motifs are just passing their popularity peak about the same time that this major technological change takes place. The slow and remarkably even decline in their proportional occurrence, which crosses this sharp break, argues positively for stylistic continuity and, thus, for continuity of inhabitants.

The only major change in design elements which might be temporally correlated with this technological break is the disappearance of the wavy-line motif made with a dragged comb and its replacement by a dotted wavy-line motif seemingly made by rocker stamping with a toothed comb. Unlike wavy-line motifs, which

cover whole vessels, the dotted wavy line is always an upper part of a more complex, overall design treatment and occurs only as an upper body band (FIG. 7g). It is also apparent that the technological break correlates with a period of low density of ceramics in the midden (FIG. 6), which may be equated, perhaps, with ephemeral occupation. The apparent contradiction between this sharp technological break associated with ephemeral occupation and the clear continuity of design motif shifts is one of the more puzzling aspects of the local ceramic sequence.

At about 1.50 m below the midden surface there are the first hints of a shift from a Khartoum Mesolithic assemblage type toward one that might be considered Khartoum Neolithic. This is not seen in the lithic materials which show a depressing consistency in their poor workmanship, the poverty of the forms involved, and in the general paucity of retouched tools (FIG. 10). Rather, this tendency is seen in the ceramics, where the pattern is one of initially gradual but then accelerating replacement of the thick but friable sherds with unslipped and poorly smoothed surfaces by thin friable sherds with well burnished surfaces and, often, with exterior red slipping (FIG. 6). For the majority of the decorated sherds, techniques of decoration, as well as motifs, remain essentially the same, although some new varieties appear (FIG. 8).

When the Khartoum Mesolithic passes into the Khartoum Neolithic at Shaqadud is not clear. There is neither a dividing line stratigraphically nor an abrupt change in the material culture, although the addition of three new motifs at 1.25 m below the surface, together with a significant percentage of thin burnished sherds, might be as good a place as any to draw the line between the two. Two radiocarbon dates (FIG. 2) bracket this point and

17. P. Villa, "Conjoinable Pieces and Site Formation Processes," *AmAnt* 47 (1982) 276-290.

indicate that in the western Butana, at least, Khartoum Mesolithic-like assemblages lasted until ca. 5770 B.P. and support the notion that there was, at this time, a local transition to Khartoum Neolithic-like assemblages. Aside from the changes in ceramics, there is another change seen at this stage. The area of the midden tested shows a shift from primary context disposal to secondary disposal. That is, the sherds become quite small, few are conjoinable, the matrix becomes highly ashy, and there is no hint of features, although small flecks of charcoal and fragmentary animal bones are scattered throughout. It appears as if the tested area was being used as a garbage dump during the Neolithic period, rather than as a living surface.

From 1.25 m upward in the midden the ceramics become more and more typical of the Khartoum Neolithic in that a higher and higher percentage of all sherds is thin and burnished. The new, Neolithic, motifs include patterns of either stamped triangles or rouletted triangles and "vees," either alone or in combination with dots (FIG. 7d), and a pattern of parallel, closely spaced deep straight lines made one at a time by incision. Rocker stamping with a toothed comb (FIG. 7b) continues and the use of untoothed rocker stamps is introduced (FIG. 7c, f). In all cases, the new motifs are on well burnished vessels.

The trends in ceramic motifs seen during the Neolithic phase, apart from those noted above, can be summarized as follows (FIG. 8): a slow increase in the relative proportions of undecorated to decorated sherds with a parallel increase in red slipping; a rapid disappearance of banded motifs; a slow decline in the popularity of simple, tightly packed comb impressions (mat-like); the introduction and gain in popularity of a "zigzag" motif formed by an untoothed rocker stamp; and a continued increase in the popularity of burnished vessels with "zigzag" motifs made with a toothed rocker stamp.

The chipped-stone tools continue to reflect the pattern of the lower midden: poor manufacture, a limited number of types, and an almost exclusive use of local quartz and quartzite (FIG. 9). The one long-term change visible in the chipped stone is a continuous decline in the proportional occurrence of lunates (FIG. 10). It is striking that those chipped- and polished-stone tools that typify the Khartoum Neolithic in the Nile Valley—gauges, adzes, large lunates, etc.—are completely missing at Shaquadud. On the other hand, the ground-stone artifacts, such as hand stones, milling stones, perforated rings, etc., are present throughout the midden deposits and do, in fact, stratigraphically parallel their counterparts along the Nile.<sup>18</sup> Thus, for example, stone rings are associated

18. A. J. Arkell, *The Prehistory of the Nile Valley* (E. J. Brill: Leiden 1975) 19–30.

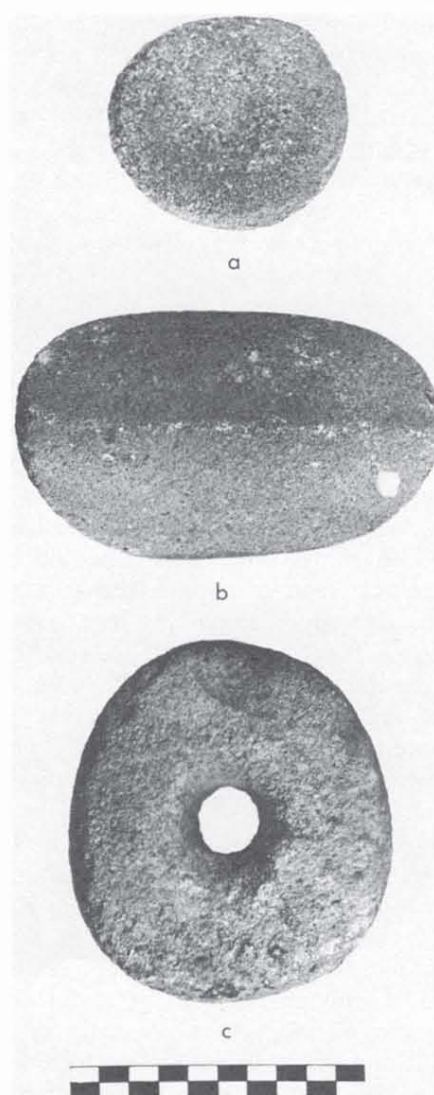


Figure 11. Typical ground-stone artifacts from the midden: a, dimpled stone; b, keeled hand stone; c, stone ring.

only with the Khartoum Mesolithic, and hand stones with keeled cross sections and pitted stones are common in the Neolithic levels (FIG. 11). Again, as in the Khartoum Mesolithic levels, there is little material evidence for active exploitation of Nile Valley resources. Only a few pieces of agate and rhyolite were recovered among the chipped stone, but shells of the Nilotic bivalve *Aspatharia* sp. were present as well.

Although well preserved faunal materials were recovered throughout the midden, they tended to be relatively rare in all stratigraphic levels. In spite of this, enough was identifiable to give a reasonable picture of what

animals were exploited. In addition, a large number of macrobotanical remains was found which adds to our reconstruction of the economic base. If the midden is broken into three stratigraphic units—below 2.0 m, between 2.0 m and 1.25 m, and above 1.25 m—the lower two (both Khartoum Mesolithic) produced only very small samples of identifiable bone, 25 and 41 respectively. These, however, indicate a hunting economy, with some efforts put into the collection of ostrich eggs and the taking of small animals such as birds and small carnivores. Mainly antelopes were hunted. Most were small, such as oribi, but even a few larger forms (*Alcelaphine* sp.) were successfully killed. Although these lower units produced few seeds, those of *Zizyphus* were found in small number in the middle unit. *Zizyphus* produces a small, sweet berry, which today is collected in the winter and spring (November to March) and either eaten individually or the pulp is made into large, flattened round loaves which are eaten rather like bread.

The upper unit, representing the Khartoum Neolithic levels, produced a larger sample, 296 identifiable bones. Considering that both domestic cattle and small livestock have been confirmed at a number of Khartoum Neolithic sites within the Nile Valley, it is remarkable that there is no evidence for any domestic animal in this upper unit at the Shaqadud midden. Rather, there is ample evidence for the continuation of an economy based on hunting and gathering. Although the sample size may be the cause, the Khartoum Neolithic levels exhibit a much wider range of animals than do the underlying Khartoum Mesolithic levels. Small animals such as monkeys, turtles, gallinaceous birds, porcupine, and ground squirrels were taken. Carnivores of various sorts were also hunted, as were warhogs. A whole range of antelope was hunted, from the small oribi to the large kudu and hartebeest or topi. Even a few giraffe bones were recovered. On the basis of the Shaqadud midden faunal sample, it appears that either domestic animals were limited to the Nile Valley or that domestic animals were kept but not killed for food with enough regularity to get into a somewhat small faunal sample. Since only 50 km separates Shaqadud from the Nile Valley, it is difficult to believe that domestic animals were not kept by Shaqadud's inhabitants. More likely, domestic animals were kept and exploited for milk and hair rather than for meat, as is the practice even today among the local inhabitants of the Naga area.

The uppermost 20 cm of the midden contains mainly Khartoum Neolithic-type ceramics, but there is a small admixture of other, demonstrably later sherds, which contaminates that portion of the stratigraphy. In any case, it seems clear that the last peoples to use the

midden intensively were still fully within the Khartoum Neolithic range. At this point in the occupational history of Shaqadud there is a hiatus, both stratigraphically and culturally. How long Shaqadud was abandoned is unknown, but when it was again occupied the people limited their settlement to the very back of the box canyon—around the plunge pool and in the cave itself.

The whole of the 3.35 m of cave deposits contains cultural materials, while somewhat over 1.2 m of similar materials is found along the NE side of the basin in test pit 4, under 25 cm of pond deposits. Based upon radiocarbon dates (FIG. 2), it is likely that the sediment accumulation in the cave was rapid, taking perhaps only 1,000 years to fill the cave. The dates indicate that the earliest occupation of the basin was at ca. 4200 B.P., while the top sediments of the cave were deposited at ca. 3600 B.P. Although ceramic densities in the lower portion of the basin are moderate, it appears that the cave itself was never very intensively occupied. Fireplaces, partly articulated bone, and conjoinable sherds, however, indicate that the cave was truly lived in during this millennium, if only ephemerally.

In spite of the casual nature of the cave occupation, sufficient artifacts, bones, and seeds were recovered throughout the stratigraphic sequence to permit detailed definition of the material culture of those inhabiting the cave, as well as to gain some insight into the economic adaptations of that period. Initially, it seemed that there was no change in material goods during the basin and cave occupations, but, with the increased samples of the second field season, it became clear that considerable shifts took place in ceramic technology and decoration during this rather brief period. More than that, it became apparent that the earliest ceramic assemblage from the basin and the bottom of the cave held little in common with that of the upper midden. In fact, if vessel shape, paste, surface treatment, and decorative motifs are considered, it must be concluded that the basin and cave assemblages belong to a different ceramic tradition than that associated with the Khartoum Neolithic of the upper midden.

In the Khartoum Neolithic and even Mesolithic levels of the midden, all vessels seem to have conical bases, direct rims, and either straight or only slightly constricted orifices. In the basin deposits and in the lower cave levels vessels seem to have either flat or rounded bases, there is a wide range of rim shapes from direct to everted, and the vessels seem to include a good number of small, low, open bowls, some with slightly carinated sides. A few rims exhibit diagonal finger impressions (FIG. 12a, e), a decorative device that is commonly found at sites in the Southern Atbai, some 300 miles to the east, along

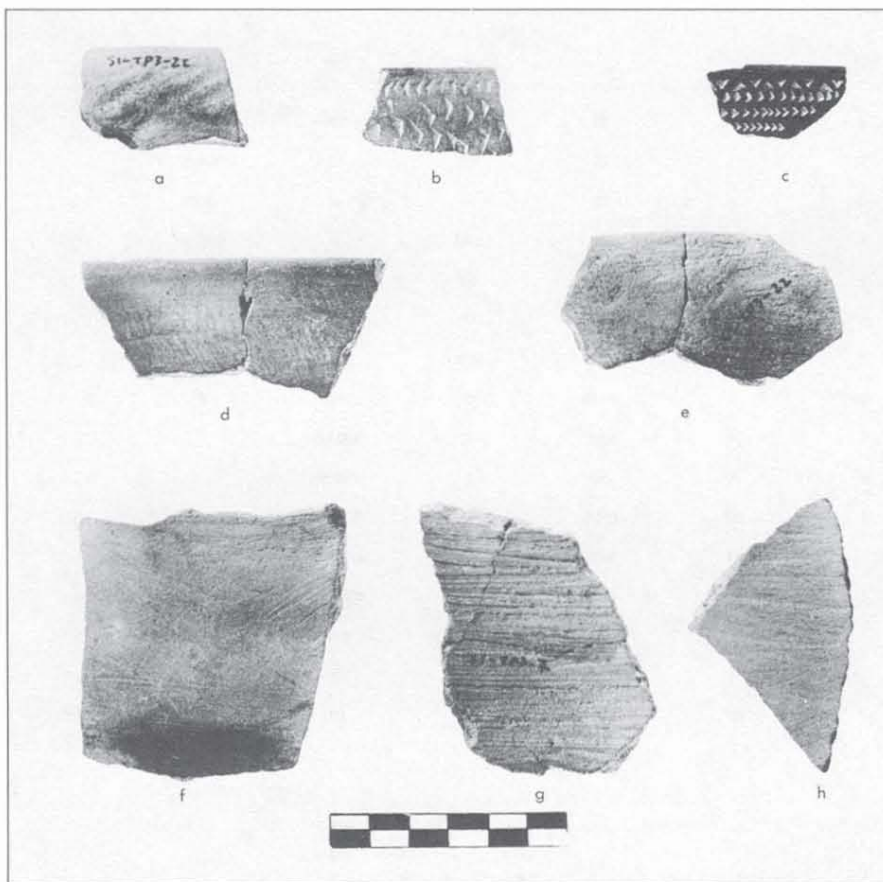


Figure 12. Typical ceramics from the basin and lower cave deposits: a, e, rims with pressed finger impressions; b, c, rims of fine black-slipped ware with triangular impressions; d, interior of black-slipped open bowl with shallow, fine indentations; f-h, wiped and smoothed sherds (g, a view of an interior surface).

and east of the Atbara River.<sup>19</sup> Although surface treatment includes common black and buff slipping, and rare red slipping, sherds are mainly unslipped, but heavily wiped and then smoothed (FIG. 12f-h). For a smaller number, the black slipping is highly burnished but this does not fully remove the striations. An even smaller number of sherds consists of a very fine black-slipped ware with a fine paste and very highly burnished surfaces. None of these types is found in the upper midden. Decoration, unlike in the Neolithic/Mesolithic midden, is extremely rare and is limited to faint "chatter" marks over the body of a vessel, shallow impressions on the inside of bowls (FIG. 12d) or a band of small, clearly formed, triangular stamped impressions just below the rim of what mostly appear to be small, thin, black-slipped open bowls (FIGS. 7b; 12b,c).

This ceramic assemblage, while characterizing the lower cave and almost all of the basin deposits, gives way to different forms and ceramic types as time passes;

19. R. Fattovich, A. Marks, and A. Mohammed-Ali, "The Archaeology of the Eastern Sahel, Sudan: Preliminary Results," *African Archaeological Review* 2 (1984) 173-188.

again, however, there is a demonstrable developmental sequence for the ceramics which indicates cultural continuity. A seriation of the pottery types recognized from the cave shows that there is considerable change for some types, but also that others remain rather constant throughout the sediment accumulation (FIG. 13). The types recognized are all new to the archaeology of the central Sudan, since no site of this period has ever been excavated. Although detailed descriptions of these ceramic types are still being written, in general terms the following types tend to characterize the middle and upper levels of the cave: a wiped-and-burnished, unslipped ware with striations reminiscent of brush strokes and rim decorations of grooved incised lines, forming chevrons, diamonds, or hachured areas (FIG. 14c, i-j); a fiber-tempered ware which is poorly made and has a thin buff slip and low burnishing; a fingernail-impressed ware which is unslipped, with moderately smoothed surfaces, and is covered with various forms of fingernail impressions (FIG. 14d); a streaky burnished ware similar to the wiped-and-burnished, but which is slipped in brown or buff; a grooved unslipped ware with parallel incised

Depth (m)	A	B/C	D/E	F/G/H	I	J	K/L	M	Sample Size
.55-.7	■		■		■	■	■	■	86
.7-.85	■		■		■	■	■	■	89
.85-1.0			■		■	■	■	■	104
1.0-1.15	■		■	■		■		■	59
1.15-1.3	■		■		■	■	■		102
1.3-1.45	■		■	■	■	■	■		101
1.45-1.6	■		■		■	■	■		231
1.6-1.75	■		■		■	■	■		222
1.75-1.9	■		■	■	■	■	■	■	247
1.9-2.05	■		■	■	■		■	■	295
2.05-2.2	■		■	■	■		■	■	238
2.2-2.35	■			■	■		■	■	245
2.35-2.5				■	■		■	■	81
2.5-2.65	■	■		■			■		51
2.65-2.8	■	■		■			■		129
2.8-2.95	■	■		■	■		■		65

Figure 13. Seriation of cave ceramics by provisional types and grouped levels. A, Thick Black Slipped; B/C, all Thin Black Slipped; D/E, Thin Impressed; F/G/H, Red Slipped; I, Fiber Tempered; J, Fingernail Impressed; K/L, Wiped and Burnished and Streaky Burnished; M, Grooved Unslipped. These provisional types are undergoing additional study. The figure is based on the cave ceramics only from the 1981/82 field season and, thus, is merely suggestive of the final pattern.

grooving on the body sherds and with various diagonal slashes, fingernail impressions, cross-hatched groove incisions below the rim, or fine diagonal cord impressions (FIGS. 14a, e, g-h); and a hachured-groove incised ware which is black-slipped and has zoned, parallel incised lines and rim treatments similar to the grooved unslipped ware (FIG. 14f).

On the whole, the stratigraphic sequence in the cave indicates a decline in the proportional occurrence of the finer wares and the growth in popularity of the poorly made wares, although both kinds of sherds occur throughout the deposits (FIG. 13). There is no question, however, that the lowest ceramic assemblage is quite different from the uppermost, particularly because of the number of thin black-slipped sherds and the paucity of all decorated forms.

Unlike the ceramics, the chipped-stone tools show little change through the sequence, except that below 2.5 m there is consistently a lower percentage of lunates than above 2.5 m by a considerable margin (FIG. 10). Here, again, it must be emphasized that the chipped tools exhibit few forms and most are poorly made. Only

one new type makes an appearance, the scaled piece (FIG. 9), which documents a consistent bipolar reduction technique which is barely hinted at in the midden.

The ground stone in the cave includes mainly simple hand stones. Keeled examples are missing, as are stone rings. There is, however, a type found only in the cave: an elongated rod with rounded ends and with either a triangular or a rectangular cross section (FIG. 15). While these may be pestles, they may also be merely elongated hand stones. They might be considered prototypes for those with a round cross section which are common in the Meroitic period.<sup>20</sup>

While few faunal remains came from the basin deposits, the cave contained quite a number, and information is available on that aspect of the local economy. Since the cave deposits date to the 3rd millennium B.C. (MASCA calibrated), the presence of domestic animals is to be expected. Yet, it is only at the top of the cave deposits that any indication of them occurs and then it

20. Dr. A. Hakim, Department of Archaeology, University of Khartoum, personal communication.

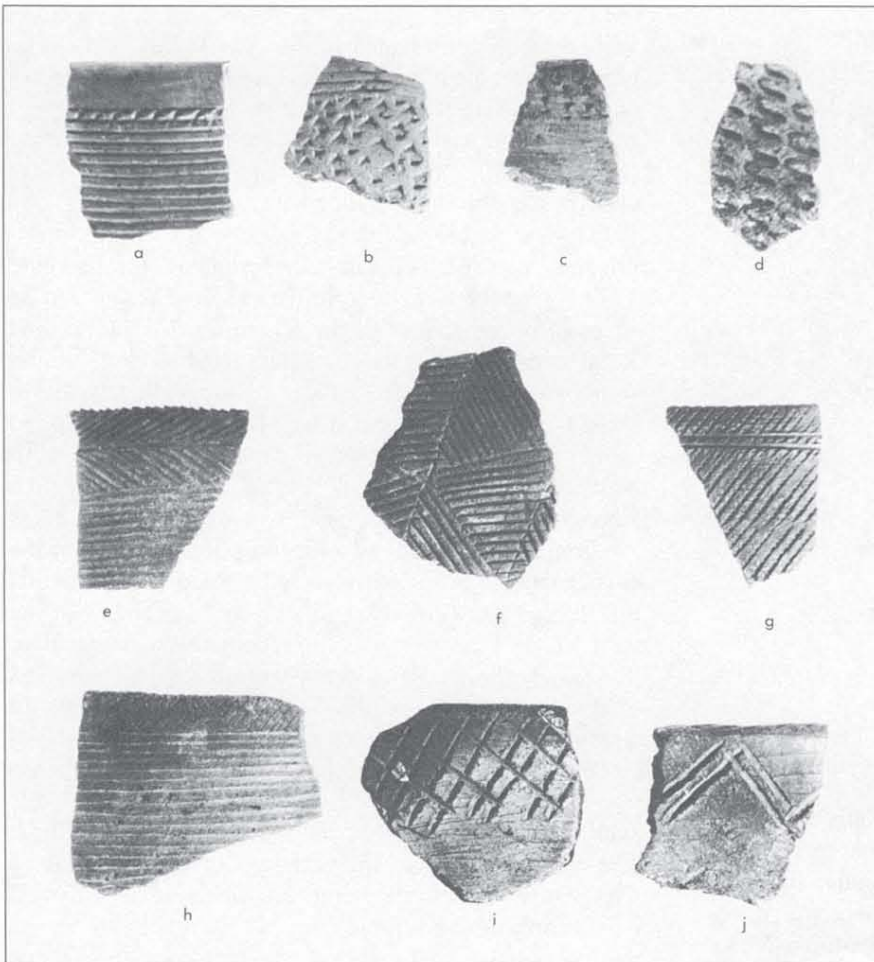


Figure 14. Typical ceramics from the cave deposits: a, rim from a grooved ware bowl; b, rim from a Red Slipped ware with triangular impressions; c, rim from a wiped-and-burnished ware bowl; d, fin-gernail impressed; e–h, grooved and hatched-grooved sherds (e and g show additional fine cord markings); i–j, rims from wiped-and-burnished ware vessels.

is limited to rare bones of dog, perhaps donkey, and cattle. As yet there is just the barest possibility of small livestock. We are faced with a situation more extreme than that of the upper midden deposits—little evidence for domestic cattle or sheep/goat in a period long after their documented presence within the Nile Valley. Until new evidence is found, the paucity of their remains is best explained by the exploitation of such animals as non-meat resources, while hunting provided the desired meat. The faunal materials certainly attest to hunting. Most of the animals hunted during the Neolithic were still being hunted, although the larger antelopes are not found and hare makes an appearance. Small antelopes were hunted, as were giraffes; a large part of one was found in the middle cave deposits.

Flotation of the cave deposits produced some positive results. Although not a large number of macrobotanical remains were found, they included *Zizyphus* sp., examples from two families of grass, *Solanaceae* and *Cruciferae* (as yet not identified further), and, most im-

portantly, probable domestic millet between depths of 2.1 m and 2.45 m. This last can be dated to about 2500 B.C. (MASCA calibrated) and is by far the earliest evidence for domestic millet in the Sahel,<sup>21</sup> although it was not unexpected.<sup>22</sup>

The cave deposits terminate at the very end of the 3rd millennium B.C. and, therefore, are temporally separated from the Meroitic period by a little more than a millennium. There does not appear to be any other occupation within the Shaqadud complex that could fill this gap, and, thus, pre-Meroitic occupation seemingly comes to an end.

21. P. Munson, "Archaeological Data on the Origin of Cultivation in the Southwestern Sahara and its Implication for West Africa," in J. R. Harlan et al., eds., *Origins of African Plant Domestication* (Mouton: The Hague 1976) 187–210.

22. A. Stemler, "Origins of Plant Domestication (*sic*) in the Sahara and the Nile Valley," in M. Williams and H. Faure, eds., *The Sahara and the Nile* (A. A. Balkema: Rotterdam 1980) 503–526.



Figure 15. Elongated hand stones or pestles, a type found only in the cave.

### Discussion

How then might Shaqadud be viewed and what does it tell us about both the prehistory of the central Nile Valley and that of its hinterlands? The midden deposits, combined with site S21, clearly document a stratigraphically continuous development of the Khartoum Mesolithic over a long period of time. The dates from the Nile Valley for Early Khartoum appear to have fallen fortuitously at the early end of this development, until this year leaving an illusion of a significant temporal hiatus between the Khartoum Mesolithic and the Khartoum Neolithic. The dates from Shaqadud, as well as the continuity of the developmental sequence, reaffirm that there is no gap between the two, either temporally or developmentally. In addition, the dates from Shaqadud reinforce the idea that the Khartoum Neolithic began no earlier than 5700 B.P. and, therefore, that it existed for only a relatively short time. It is useful, in this context, to point out that those Nubian sites referred to as Khartoum Variant and those from the Dongola Reach called Karmakol exhibit traits related to the Khartoum Mesolithic, not the Khartoum Neolithic.<sup>23</sup>

It now seems unlikely that the actual transition from

23. J. Shiner, "The Khartoum Variant Industry," in F. Wendorf, ed., *The Prehistory of Nubia*, vol. 2 (Southern Methodist University Press: Dallas 1968) 768 and A. Marks, J. Shiner, and T. R. Hays, "Survey and Excavations in the Dongola Reach, Sudan," *CA* 9:4 (1968) 319-323.

the Khartoum Mesolithic to the Khartoum Neolithic was limited to the hinterlands of the Nile Valley. It is more probable that the transition was rapid and that the largely disturbed Khartoum Neolithic sites in the Nile Valley,<sup>24</sup> which have relatively shallow deposits, are not optimal for recognizing the continuity of change which is so clear in the Shaqadud midden.

It is likely that additional work, with careful stratigraphic controls, will, in fact, establish for the Nile Valley what we have seen in the Butana. Yet, it should be emphasized that both the Khartoum Mesolithic and Khartoum Neolithic assemblages at Shaqadud are, in some ways, distinct from those in the Valley. While it should be expected that Shaqadud would contain no artifacts relating to riverine exploitation (bone, fish hooks, harpoons, net weights, etc.), the absence of such Khartoum Neolithic diagnostics as bone axes, gauges, amazonite stone beads, zeolite lip plugs, large lunates, etc. cannot be explained merely by microenvironmental differences. It seems clear that, while contact with the Nile Valley was probable throughout the occupation of Shaqadud, the local residents were essentially adapted to the grass steppe of the Sahel and were not merely seasonal visitors to the area from the banks of the Nile.

The implications of the basin and cave materials are not so obvious. Within the central Nile Valley, at least, such ceramic assemblages have not yet been described. The recent surveys of the east bank in the Shendi area have turned up few occurrences, while along the west bank, north of Omdurman, surveys have failed to reveal any comparable materials.<sup>25</sup> In fact, it does appear that the central Nile Valley was basically uninhabited from the 3rd through the 2nd millennium B.C. The reasons for this are unclear, although it may relate to a possible deep cutting of the Nile channel, a factor in the apparent abandonment of Nubia at a later date.<sup>26</sup> If the Shaqadud basin and cave materials do not derive from the central Nile Valley, and have no geneses in the Khartoum Neolithic, while the ephemeral nature of the occupations makes it unlikely that there was an autochthonous base, from where does this material come? Somewhat similar ceramic materials have been reported from a number of surface occurrences near the Dal Cataract,<sup>27</sup> but their

24. A. Mohammed-Ali, *The Neolithic Period in the Sudan: 6,000-2,500 B.C.* B.A.R., African Series (Oxford 1982).

25. Geus, op. cit. (in note 6). Survey of the west bank was carried out by the Department of Archaeology, University of Khartoum, over the past four years.

26. Adams, op. cit. (in note 9) 244.

27. F. Geus, *Rapport Annuel d'Activite 1975-76*. Sudan Antiquities Service: French Archaeological Research Unit (Khartoum 1976) 10-11, 36 pl. V.



rarity in that northern area is not suggestive of a center for its development. The present evidence instead strongly points to connections well to the east, in the Southern Atbai of the eastern Sudan (FIG. 1). Not only are the basic ceramic surface treatments essentially the same, but the decorative techniques and motifs strongly parallel those coming from assemblages in the Gash Delta and westward to the Atbara which have been dated to the 4th millennium and 3rd millennium B.C.<sup>28</sup> Even the presence of bipolar core reduction in the cave matches a constant and almost dominant pattern seen in the Southern Atbai, but which is lacking in the Nile Valley. This picture of Shaqadud as a western outlier, during the 3rd millennium B.C., of a basically eastern Sudanese cultural tradition points to the apparent marginality of the Nile Valley itself during that period and to the cultural, as well as ecological, unity of the grasslands that stretch eastward across the Butana and the Southern Atbai to the Eritrean hills at the Ethiopian border.

The seeming rarity of this type of ceramic assemblage in the Nile Valley may relate to the steppe adaptation of the makers of these ceramics, since in the heartland of this Atbai Ceramic Tradition there is relatively little evidence for riverine exploitation, in spite of the presence of both the Atbara and Gash Rivers in the core area.<sup>29</sup> The Nile Valley itself, therefore, may have held only marginal attractions to those occupying the eastern grasslands.

This perception requires a recognition that, while the Nile Valley with its special resources was one focus of mid-Holocene human adaptation and habitation, there was another which was nonriverine, adapted instead to the wooded grassland savannah which, after all, covered a huge area both to the east and west of the Nile Valley.<sup>30</sup> Through time, the environmental changes within this savannah seem to have made it somewhat less attractive, but even during the 3rd millennium B.C., it was not without its virtues. Certainly, during the Khartoum Mesolithic occupations of S21 and the lower midden, there is ample evidence for a wooded savannah in the vicinity

of Shaqadud. At S21 there were recovered numbers of both the freshwater gastropod *Pila wernei* and the land-snail *Limicolaria cailliaudi*. The latter would need at least 400 mm of rainfall to survive, and *Pila* can only live in seasonally inundated areas. Given the topographic position of S21, this inundation must have been caused by local rainfall and poor drainage, since the effects of Nile floods were limited to the valley itself. In addition, the presence of a marsh cane rat at S21 reinforces the picture of seasonally swampy terrain. The presence of larger antelopes from S21 and the lower midden (roan antelope, topi or hartebeest) points to a wooded savannah, with areas of grasses. Clearly, such an environment would have been quite desirable for hunters and gatherers. Only during the end of the dry season might there have been some pressure, owing to the paucity of available surface water. This appears to be why Shaqadud experienced such long-term and intensive occupation. The plunge pool at the back of the box canyon probably held water year round and was filled to overflowing yearly during the rains.

There is no reason to believe that Shaqadud is a unique site in the Butana; it is merely the first found and studied. The sandstone outcrops of the western Butana repeat the topographic configuration found at Shaqadud many times and, further to the east, in the central Butana, small *playas* dot the landscape. There is every reason to suppose that the grasslands to the east of the Nile Valley, all the way to the Ethiopian border, not only were sufficiently hospitable ecologically for consistent human occupation, but that they may well have been as important, if not more important, in the cultural development of the central Sudan in pre-Meroitic times as was the Nile Valley itself.

28. Fattovich et al., op. cit. (in note 19).

29. D. Geraads, "Faunal Remains from Archaeological Sites in the Gash Delta, Sudan," *Nyame Akuma* 23 (1984) and Fattovich et al., op. cit. (in note 19) 22.

30. Our data suggest that the settlement pattern in the western Butana differs markedly from that generalized model proposed by J. D. Clark in his article, "Human Populations and Cultural Adaptations in the Sahara and Nile during Prehistoric Times," in M. Williams and H. Faure, eds., *The Sahara and the Nile* (A. A. Balkema: Rotterdam 1980) 569-577. His emphasis, however, was on a Saharan environment that was quite different from that of the Butana.

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*Achilles Gautier, is on the faunal materials recovered by the Butana Archaeological Project at Shaqadud and elsewhere to the east. He is also restudying the faunal assemblages from the sites of Khartoum Hospital and Shahienab.*

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