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Nabta Playa and Its Role in Northeastern African Prehistory

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Nabta Playa basin offers an unprecedented longitudinal view on the emergence, consolidation and complexification on human–livestock relationships, from the early stage of the Early Holocene (c. 11,000 cal. B.P.) to 6000 B.P. The problem of cattle domestication in Northeastern Africa is considered and hopefully ''solved'' in the light of new mtDNA evidence which suggest an early late Pleistocene split between African, Asian, and Eurasian wild *Bos* populations. The paper presents a contextualized analysis of almost all the components of archaeological investigation, including climatic change, culture history of Early to Mid-Holocene Nabta-Playans, the development of social differentiation, and probably ranking with ''labor-consuming'' megalithic features with the emergence of characteristic features of pastoral ideology and religions. As far as the emergence and adoption of new foodways are concerned, the cultural development outlined with the Nabta Playa archaeological record is important for the understanding of the Holocene prehistory of Africa as a whole.

INTRODUCTION

When traveling through the area, the Western Desert of Egypt does not appear to be very promising for the study of prehistoric archaeology. On closer examination, however, even the untrained eye can see numerous scatters of lithic artifacts and other evidence of human occupation in this area which today is unoccupied and seemingly devoid of all life. The fact that it is a complete desert, with less than 1 mm of precipitation per year and is lacking in grasses, bushes, and trees (except in a very few places where ground water comes near the surface), makes the archaeology more visible and permits detailed archaeological surveys that are rarely possible in areas covered with vegetation (see Wendorf et al. 1987a).

The Western Desert has a long history of human use beginning at least as early as the early Middle Pleistocene and offers a rare opportunity to study past human adaptation to a hyperarid environment. For example, during the early Holocene among the more interesting developments is the appearance of presumably domestic cattle perhaps as early as 11,000 cal B.P.; the accompanying presence of sophisticated and well-made pottery in the Early Khartoum tradition (Banks 1980; Close 1995); the introduction of caprovids from Southwest Asia between ca. 8400 and 8000 cal B.P. (Gautier 1980); technological innovations such as deep wells which made it possible for groups to live in the desert throughout the year (Wendorf et al. 1984); the emergence of a regional ceremonial center with megalithic alignments,

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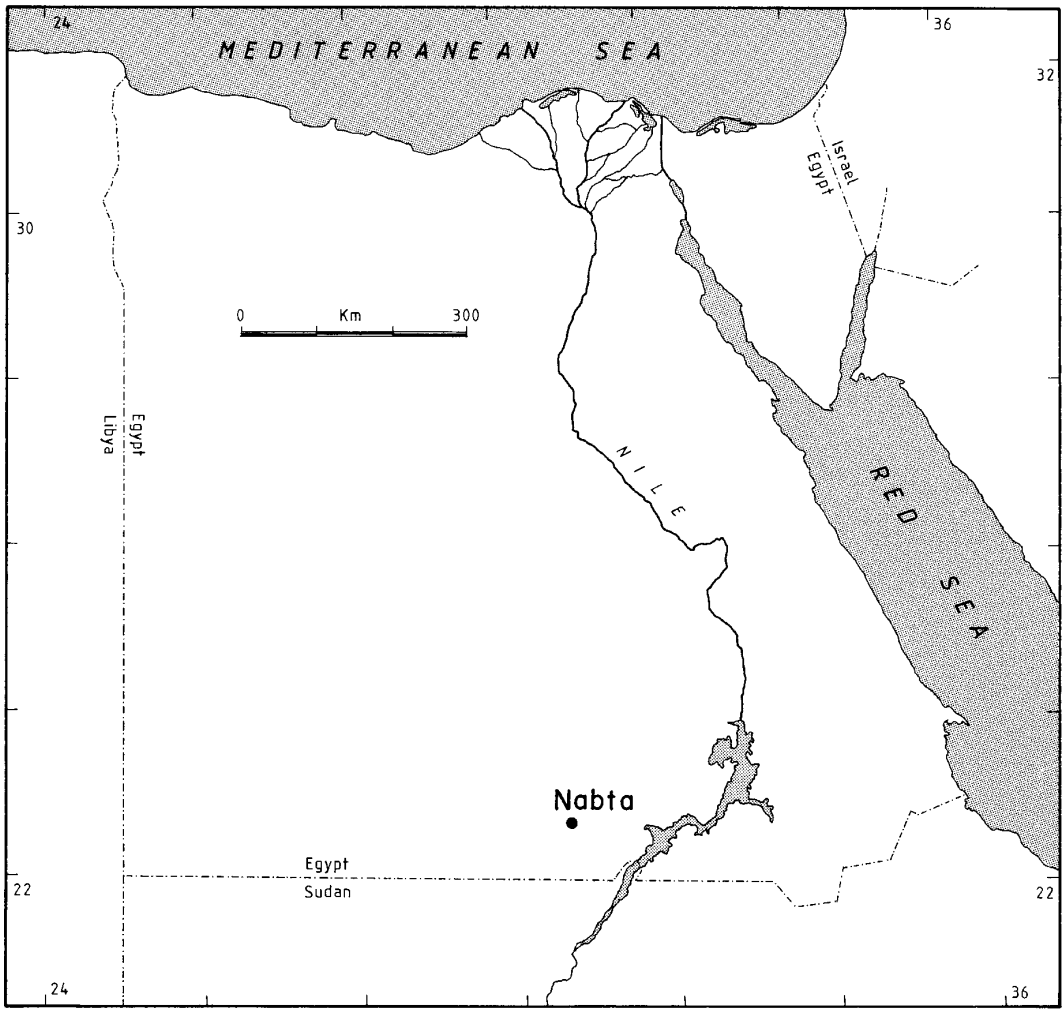

FIG. 1. Map of Egypt showing location of Nabta Playa.

stone circles, cattle burials, and other large-scale constructions the functions of which are not yet well understood; and indications of social control and perhaps a ranked social system by around 7500 cal B.P., several hundred years before there is evidence of similar complexity in the Nile Valley. This puzzling proximity of cultural innovation and environmental stress in the Western Desert deserves serious consideration by those who have interests in the relationship between environment and cultural processes.

NABTA PLAYA BASIN: LANDSCAPE AND PALAEOECOLOGY

Many of these interesting developments in the Western Desert are best seen in a large internally drained basin known as Nabta Playa, and located near the southeastern edge of the Western Desert, about 100 km west of Abu Simbel and 30 km north of the Sudanese border (Fig. 1). Because of the size of the drainage area for the basin, Nabta Playa appears to have been an unusually attractive locality for

early and middle Holocene groups, and it and the surrounding basins are one of the most important archaeological areas in the Western Desert. Numerous archaeological sites occur here, often imbedded within sediments of the ephemeral ponds and lakes (playas) that filled the basins. The Nabta basin also is of particular interest because it has one of the longest and most complete sequences of Holocene occupations known in the Sahara. These sites and their stratigraphic settings are the focus of this paper.

The Combined Prehistoric Expedition began studying the Holocene archaeology at Nabta in 1974–1975 and 1977 (Wendorf and Schild 1980: 82–165) and, more recently, in 1990–1992, 1994, and 1996. The work since 1990 has not been published in detail; however, several short papers have appeared discussing some of the more interesting features found at Nabta (Dahlberg et al. 1995; Gautier et al. 1994; Kubiak-Martens and Wasylikowa 1994; Wasylikowa and Kubiak-Martens 1995; Wasylikowa et al. 1993, 1995, in press; Wendorf et al. 1991, 1992, 1993, in press; Wendorf and Schild 1994, 1995/1996, in press a). A final report on the prehistory of Nabta Playa is in the final stages of preparation and should appear shortly.

Although the Western Desert is today a rainless desert, it was not always so arid. There is good evidence that at several times in the past this area received as much as 500 mm of precipitation per year, at which times there were permanent lakes, large springs and at least seasonal streams. The most recent of these wet periods occurred during the Last Interglacial and is dated between 130,000 and 70,000 years ago by several radiometric techniques. During this time the area was a thornbush savanna and supported numerous large animals such as extinct buffalo and camels, large giraffes, and several varieties of antelopes and gazelles. Numerous Middle Paleolithic sites are associated with the lake and spring sediments of this period (Caton-Thompson 1952; Wendorf et al. 1993). Still earlier Middle Paleolithic and Final and Late Acheulean, and perhaps Middle Acheulean, artifacts are associated with playa, lake, and stream deposits of wet periods that preceded those of the Last Interglacial (Schild and Wendorf 1977; Wendorf and Schild 1980; Wendorf et al. 1985a; McHugh et al. 1988a, b, 1989). Insofar as is known, only occasional finds of heavily eroded artifacts of these earlier periods occur in the Nabta area.

The Western Desert was hyperarid from shortly after 70,000 years ago until around 12,500 to 13,000 cal B.P. During this arid period the water table fell to a level as low as or lower than that of today, and wind erosion scoured out numerous deep depressions in the bedrock. One of those wind deflated basins was Nabta. Before 12,000 years ago the summer monsoon system of tropical Africa moved northward as far as southern Egypt, and during the more moist phases brought rainfall variously estimated on the identifications of wood charcoal to have been between 50 and 100 mm/year (Neumann 1989; Barakat 1995), and on the basis of associated fauna between 100 and 200 mm/year (Wendorf and Schild 1980: 236). Some interpretations based on sediments place the rainfall much lower, around 30 mm/year (Kropelin 1993). Whatever the amount, the precipitation was limited and highly seasonal; both plants and animals indicate that most of the rain fell during the summer months. The rainfall was also unpredictable, droughts, were frequent, and some areas may have received no rain at all for long periods (Wendorf et al. 1984). These limited rains during the early Holocene caused seasonal lakes and ponds to develop in the depressions previously hollowed out by the wind. The Western Desert was still a dry and unpredictable environment, with no permanent

surface water and few resources. Only small animals could live there, the largest of which were two varieties of gazelles, together with hares, jackals, lizards, rodents, and desert foxes, all of which could exist on dew or moisture from vegetation. Cattle, regarded as domestic, were also present. Limited as it was, the Holocene moist period in the Western Desert lasted about 5000 years, until around 5900 cal B.P., and at several intervals it supported reasonably large, but highly mobile human populations who existed by large and small animal pastoralism, hunting, and intensive gathering of a wide variety of wild plants.

THE PREHISTORIC SEQUENCE

The Early Neolithic (10,800–8900 cal B.P.)

The earliest excavated sites at Nabta are dated by radiocarbon to around 10,300 cal B.P. and usually are located on fossil dunes that accumulated on the floors of the basins during the preceeding interval of hyperaridity. These sites consist of small scatters of lithic artifacts and fossil bones; there is no evidence of houses, storage pits, or wells, although most have small hearth areas. One of these sites yielded charred seeds of wild millet and two varieties of legumes (Wasylikowa, report to F. Wendorf 1996). The locations of the sites in the lower part of the basins and the absence of wells indicate that these sites were occupied when the playas were almost dry, probably in early fall, and abandoned in the spring, the driest time of the year when surface water would not have been available.

El Adam type settlements (10,800–9800 cal B.P.). These earliest sites are assigned to the El Adam variety of Early Neolithic (Wendorf et al. 1984: 409–411) characterized by well-made bladelet-based lithic assemblages with straight-backed pointed bladelets, perforators, and large endscrapers made on reused Middle Paleolithic artifacts. The preferred raw material was Egyptian flint, the nearest source for which was along the Eocene Plateau, about 75 km to the north of Nabta playa. Chert, agate, and chalcedony were also used, but less frequently. A few grinding stones and rare shards of pottery also occur. The pottery is well-made and decorated over the entire exterior with deep impressions in a nested chevron made with a comb or wand. Another common design has closely spaced lines of comb impressions, some parallel to the rim and others at right angles. All of the decorations are in the ''Early Khartoum style,'' but the characteristic ''dotted wavy line'' motif of that style is missing in these earliest ceramics but it does appear in sites of a later variety of Early Neolithic. A puzzling feature of this early pottery is its rarity; it is usually limited to only a few shards in a site, a situation which has cautioned us that it might be intrusive; however, the shards occur in most of the excavated El Adam sites and the designs are unique and limited to this period. The function of this pottery is far from clear, but its rarity suggests that it was not in general use as containers; they may have been luxury or status items (Close 1995).

The lithic artifacts in these El Adam sites, except for the pottery and the reused Middle Paleolithic artifacts, are closely similar to those found in the Arkinian in the Nile Valley that is about the same age or slightly older (Schild et al. 1968). Besides rare sherds of pottery, almost all El Adam sites, which elsewhere in the Western Desert have been dated between 10,800 and 9800 cal B.P., have yielded a few bones and teeth of a large bovid, identified as Bos, as well as numerous bones of gazelle and hare, plus a few bones of jackal, turtle, small rodents, and birds, which suggests a rather poor environment, comparable to the northernmost Sahel today.

Our interpretation of their food economy is an important aspect of understanding how these early Holocene groups utilized the Western Desert. Following Gautier (1980, 1984) we have suggested that these early Holocene groups were cattle pastoralists who brought their herds into the desert for grazing after the summer rains, coming into the desert from some as yet unidentified area where wild cattle were present and where the initial steps toward domestication first occurred (Wendorf et al. 1984: 420–422; Wendorf and Schild 1994). This may have been the Nile Valley, between the First and Second Cataracts, because wild cattle had been present in that area (and a major prey animal since the Middle Paleolithic; Gautier 1968), as were people with lithic industries closely similar to those in the earliest Holocene sites in the Western Desert. We have suggested that cattle may have facilitated human use of the desert by providing a mobile, dependable, and renewable food resource in the form of milk and blood. The use of cattle as a renewable resource rather than meat may be a possible explanation for the paucity of cattle remains in these Saharan sites. This use of cattle may have been closely similar to that of modern African pastoralists, who use the by-products from their herds, but rarely kill them for meat, and then only at important ceremonial occasions. Among these groups cattle are an important source of wealth and prestige. The African pattern of cattle pastoralism may well have developed in this or a closely similar setting.

Our interpretation of the cattle remains in the Western Desert has been highly contraversial (Smith 1984, 1992; Clutton-Brock 1989, 1993; Muzzolini 1989, but also see Wendorf et al. 1987b). The objections to the hypothesis of an early and separate center of cattle domestication have been considerably weakened, however, by recent mtDNA studies of African, Eurasian, and Indian cattle which indicate that modern African and Eurasian cattle have been genetically separate populations for over 25,000 years and that Indian cattle have been separate from the other two even longer (Bradley et al. 1996). This is strong evidence that there were three separate centers of cattle domestication, one of which was in Africa.

Other evidence favoring the hypothesis that the Saharan cattle were domestic is seen in the restricted environment of the Western Desert during the early Holocene, particularly the absence of permanent water. Without permanent water it is highly unlikely that Bos could exist there except under human control. Cattle need to drink almost every day and would not have been able to move from basin to basin as the water in those basins dried up, and as the dry season intensified, they would not have been able to return to the Nile Valley, or to move farther south where permanent water was present.

That the cattle were brought to the desert under human control is also strongly supported by the composition of the other fauna that occurs with them. A faunal assemblage consisting only of small, desert adapted animals and large cows does not occur in nature. A normal population would also include intermediate-sized animals, such as hartebeest. Hartebeest and wild cattle were the predominant game in the Nile Valley, and they appear to have overlapping requirements, with hartebeest being the ''drier'' of the two (Kingdon 1982; Gautier 1987; Gautier and Van Neer 1989). The absence of hartebeest in the Western desert Holocene faunal assemblages is difficult to explain if the cattle were wild.

El Ghorab type settlements (9600–9200 cal B.P.). There was a brief period of aridity around 9800 cal B.P., when the desert appears to have been abandoned. In earlier reports we proposed that when the rains returned the desert was reoccupied by

groups we named the El Kortein variety of Early Neolithic who used bifacial points resembling the Ounan and Harif points of Algeria and the Negev (Wendorf et al. 1984). A preliminary restudy of the El Kortein sites, however, indicates that this complex may in fact date somewhat later, perhaps the early Middle Neolithic.

The evidence now available suggests that when the rains returned Nabta Playa and other basins in the Western Desert were reoccupied by groups with a lithic tool-kit that emphasized elongated scalene triangles and microburin technology. Other artifacts include grinding stones, perforators, backed bladelets, endscrapers, and a few shards of pottery similar to that found in the El Adam sites. This lithic industry characterizes the El Ghorab type of Early Neolithic, dated between 9600 and 9200 cal B.P. (Wendorf et al. 1984: 113–147). The associated fauna are again mostly gazelle and hare, but there are a few bones of wildcat, porcupine, desert hedgehog, birds, and cattle. All but the cattle are desert adapted and do not require surface water. Plant remains were not recovered from any of these sites, but this probably is because all of the El Ghorab sites were excavated before we developed proper recovery techniques. No houses are known for this period at Nabta Playa, but in the Dyke area located some 200 km northwest of Nabta, there are several oval, slab-lined houses associated with lithics of the El Ghorab type (Schild and Wendorf 1977: 113–147). Again there are no known storage pits or water wells, so it is believed that the desert continued to be used only after the summer rains and was abandoned during the driest season of the year.

Another brief period of hyperaridity, between 9200 and 9100 cal B.P., coincides with the end of the El Ghorab Neolithic in the desert (groups with similar lithic assemblages apparently continued to live in the Nile Valley after this date; Vermeersch 1978). With the return of greater rainfall around 9100 cal B.P., a new variety of Early Neolithic, the El Nabta type, appeared in the Western Desert, and they brought with them new technologies and possibly a new social system that enhanced their ability to use the desert.

El Nabta type settlements (9100–8900 cal B.P.). El Nabta settlements are usually larger than the previous Early Neolithic sites, and some of them had both large oval huts and smaller round huts, as well as numerous bell-shaped storage pits and large deep wells, sometimes with adjacent shallow basins that might have been used to water stock (Wendorf and Schild 1980: 128–140; Wendorf et al. 1984: 413–414). These El Nabta groups evidently had developed the technology and social organization needed to live in the desert throughout the year. The lithic artifacts in these El Nabta sites include numerous perforators, burins, backed bladelets (some of which are straight-backed and pointed), retouched pieces, notches, and denticulates. Simple bone points also occur, as well as pottery, the latter with several varieties of impressed designs, including ''dotted wavy line.'' Most of the vessels are small globular jars with simple, constricted rims. Pottery is still rare, but more abundant than in previous phases, possibly because the settlements were occupied by larger groups for longer periods (but still seasonally, most known sites are located in the lower parts of the basins and were flooded during the summer rains). The associated fauna is similar to that found in earlier Holocene sites, mostly gazelle and hare, and a few other small desert animals, together with an occasional Bos. A large series of radiocarbon dates place the El Nabta phase between 9100 and 8900 cal B.P.

The largest known El Nabta site (identified as E-75-6) is located on a fossil dune in the lower part of Nabta Playa (Fig. 2). The site had been reoccupied many times, the first was by an El Adam group. The El

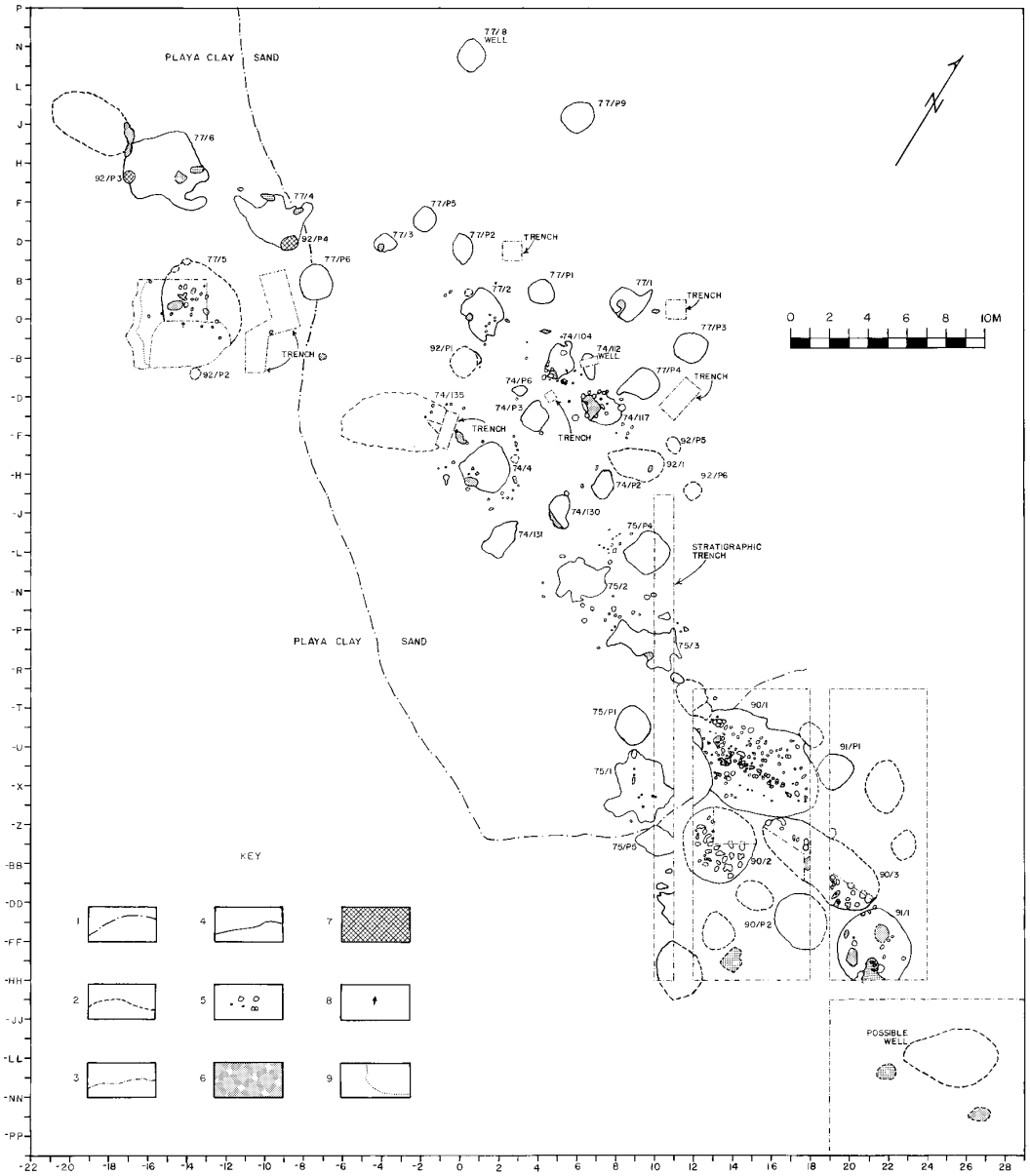

FIG. 2. Plan of Site E-75-6, El Nabta phase harvesting site at Nabta Playa. 1, Edge of playa sediments; 2, limits of unexcavated features; 3, test trenches; 4, walls of features; 5, small pits and postholes; 6, hearths; 7, later pits; 8, identification arrows; 9, possible structure.

Nabta phase settlement has not been completely excavated, but it has at least 15 houses or huts, not all occupied simultaneously but each used several times. The houses are arranged in two, probably three parallel lines, and there are three water wells, one of which was 2.5 m deep (Wendorf and Schild 1980: 131). Adjoining each house are one or more large, bell-shaped storage pits. We have previously suggested that the arrangement of the houses in rows indicates the presence of a

social system with sufficient authority to control the placement of houses in the village; however, recent excavations have disclosed that the houses are aligned along the edge of a deep basin, and arrangement of the houses may have been strongly influenced by this local topography. This may be clarified by further work, but regardless, it is clear that there was sufficient control over labor for the excavation of the deep water well. There are, however, no indications of differences in wealth, or even community storage facilities. The site has two kinds of houses: long ovals more than 6 m long and 2.5 m wide and round structures from 3 to 4 m in diameter. Stratigraphic evidence suggests that some of the long oval houses are earlier than some of the round houses, but multiple radiocarbon determinations on charcoal from both kinds of houses indicates that they are about the same age. All of them appear to have been simple brush or mat covered huts, with several shallow, saucer-like floors separated by thin lenses of silt. There were from one to three hearths or burned areas on these floors, and several (sometimes several dozen) small, hemispherical ''potholes'' that were filled with ash, charcoal, and charred edible plant remains.

Since Site E-75-6 is located in the bottom of a large basin that was flooded each year with the summer rains, it is not surprising that the site was abandoned during these rains and then reoccupied when the basin became dry. It is surprising, however, that when the people returned to the site they were able to find the precise positions of the houses even though they were covered by silt. The answer to this mystery may be the structure of the huts. A few postholes around the periphery of the houses apparently held upright posts that formed the frame to hold the mats, skins, or brush that presumably formed the walls and roof of the shelter. This frame may have been left in place when the site was abandoned each year, and when the floodwaters in the basin had receded, these still-standing frames would have marked the exact positions of the houses.

Site E-75-6 was obviously occupied during the dry season when many grasses and other plants mature, and the site seems to have been a plant collecting and processing locality (Wendorf et al. 1992). The house floors have yielded over 20,000 seeds of grasses and legumes as well as tubers and fruits representing 80 different morphological types, two-thirds of which have been identified as to taxonomic units of various ranks. All of the plants are morphologically wild and grow today in the Sahelian zone of North Africa. Among the more frequent of these are sorghum and several varieties of millets, the annual herb Schouwia, seeds of the shrub Capparis, fruit stones of Ziziphus, and several kinds of edible tubers (Wasylikowa et al. 1995: 143–147). There are some tentative indications that the sorghum may have been cultivated. Preliminary chemical analyses by infrared spectroscopy of the lepids in the archaeological sorghum show closer resemblance to some modern domestic sorghum than to wild varieties (Wasylikowa et al. 1993). Along this same line it is interesting to note that the distribution of the sorghum in the houses suggest that sorghum was treated differently from the other seeds. The significance, however, is not in whether or not the sorghum was wild or domestic, but that the sorghum and other plants were being intensively harvested and stored for future use. One may conclude that plant foods comprised a significant portion of the El Nabta diet.

The numerous storage facilities associated with the huts at several sites of this phase are further testimony to the importance of plants in the El Nabta economy

and indicate that these communities may represent a new level of adaptation to the Saharan environment where the mobility demands of cattle pastoralism were somehow merged with intensive collecting of plant foods that were harvested in significant quantities, stored, eaten, and those remaining moved elsewhere before the summer rains. This new adaptation may anticipate the emergence of cultivation in the Sahara, if it was not already underway. In this context it is undoubtedly significant that there are no traces of wheat, barley, or any other Southwest Asian domesticate. The barley recovered from this site during the 1977 excavations (Hadidi in Wendorf and Schild 1980: 347) is regarded as intrusive.

Previously we believed that a brief period of aridity coincided with the end of the El Nabta phase and the Early Neolithic. There is, however, strong evidence that occupations with typical Middle Neolithic-styled ceramics and dated only 100 years later, around 8800 to 8700 cal B.P., occur immediately above the El Nabta levels and without any evidence of an intervening episode of aridity. In the earliest of these ''Middle Neolithic'' sites they continued to prefer Egyptian flint for many of their lithic artifacts and there was continuity with the Early Neolithic in typology. Scalene triangles (some very small, less than 15 mm in length), backed bladelets, perforators, scrapers, stemmed points with pointed and retouched bases, notches, and denticulates are characteristic tools. We now assign these sites to a later phase of the El Nabta type Neolithic. In the succeeding later Middle Neolithic there is a shift to local rocks for lithic artifacts, with a greater use of quartz and quartzite (few of which are retouched); in addition, bladelet technology sharply declines; and among the retouched tools, there are few scalene triangles or backed bladelets, while points with retouched bases disappear and are replaced by points made on small flakes, with convex, concave, or straight retouched bases and lightly retouched pointed tips or lateral edges.

The Middle Neolithic (8300–7600 cal B.P.)

Radiocarbon dates place the beginning of the Middle Neolithic around 8300 cal B.P. The environment during this period was similar to that in the Early Neolithic, or slightly drier; the identification of wood charcoal indicates fewer species of wood (Barakat 1995), and in the fauna there is an increase in the frequency of hare relative to gazelle (Gautier 1984). However, both of these changes may be reflections of greater human presence. The missing species of trees may have been preferred for firewood and were the first to be depleted near the settlements. A similar explanation may be offered for the reduced frequency of gazelle. These shy animals will move away from an area where they are repeatedly hunted, while hares are less inclined to do so. The faunal assemblages in the Middle Neolithic sites are larger and richer than those in the Early Neolithic and comprise all of the species of animals previously noted, including cattle, as well as several kinds of lizards, ground squirrels, field rats, hyena, sand fox, and one example of either oryx or addax.

Around 8000 cal B.P. there was an important new addition to the food economy of the Middle Neolithic. Domestic caprovids, either sheep or goat, or both, were introduced from Southwest Asia, probably by way of the Nile Valley (although the oldest radiocarbon dates now available for the Neolithic along the Nile are about 500 years later). Cattle and caprovids have different herding requirements, and in a limited environment such as the Western Desert, the management of the two herds must have posed a challenge, but they were obviously successful.

Unlike the bones of cattle which continue to be rare in most sites, once introduced, sheep became increasingly more frequent and in later periods replaced gazelle as the major source of meat.

Despite an intensive search at several sites in the Nabta area, edible plant remains have not been recovered from Middle Neolithic contexts. The absence of plant remains is almost certainly due to preservation and makes us appreciate how fortunate we were to find Site E-75-6. Thus far, we have not been able to find a Middle Neolithic site in a setting that duplicates Site E-75-6. Nevertheless, most Middle Neolithic sites have numerous, large, bell-shaped storage pits and abundant grinding stones, both of which suggest that plant foods, most likely the same ones found at E-75-6, were an important component of their diet.

There are often houses in Middle Neolithic sites. These houses are usually round in outline, semi-subterranean, between 30 and 40 cm deep, often with slab-lined walls and sloping lateral entryways. In some sites the houses are jacal-like structures with wattle and daub walls. Hearths are usually in the center of the floors. Middle Neolithic sites occur in a variety of sizes and settings (Wendorf et al. 1985). Some of them are small, with only one or two houses, and these are usually located in smaller basins. There are also several somewhat larger sites with half dozen or more houses in larger basins; other sites are located on dunes overlookng these basins. On the sand-sheets and plateaus there are numerous small clusters of Middle Neolithic artifacts, often poorly made, with a hearth and not much else. Finally, there is one very large site with unusually deep trash accumulation (2 m) on a dune along a high beachline of Nabta Playa (Site E-75-8; Fig. 3). This variation in settlement sizes and their positions in the landscape has been interpreted as reflecting a seasonally responsive regional settlement system in which the population was dispersed into small- and medium-sized villages located in the lower parts of the basins during most of the year, particularly the dry season. During the wet season they apparently gathered into a large community for social and ceremonial purposes along the beach of Nabta Playa, the largest basin in the area. Houses are not known at Site E-75-8 (Fig. 3), the supposed ''aggregation'' locality, but there are numerous stone-filled hearths, and the site has yielded the highest frequency of cattle bones of any locality in the Nubian Desert. In this connection it is useful to note that among many African pastoralists today, cattle are frequently sacrificed and consumed at important ceremonial occasions to celebrate the birth or death of an important personage and at betrothals and marriages. The suggestion that Site E-75-8 was where people gathered for ceremonial purposes in the late Middle Neolithic anticipates the slightly later emergence of Nabta Playa as a regional ceremonial center similar to the regional centers that occur even today in Sub-Saharan Africa, where they serve to bind together groups that are often widely separated in space.

The other elements in the Middle Neolithic settlement system include the sites on the dunes, which are believed to record brief occupations by Middle Neolithic people after they had left the ''aggregation'' site and while they waited for their basin to dry sufficiently for them to move down onto the playa floors, and the small sites on the sandsheets, seen as temporary camps by herders, possibly young boys who were not yet skilled in stone working. These herding camps could have been used at any time of the year, but most usefully after the summer rains when grazing in those areas would have been at its best.

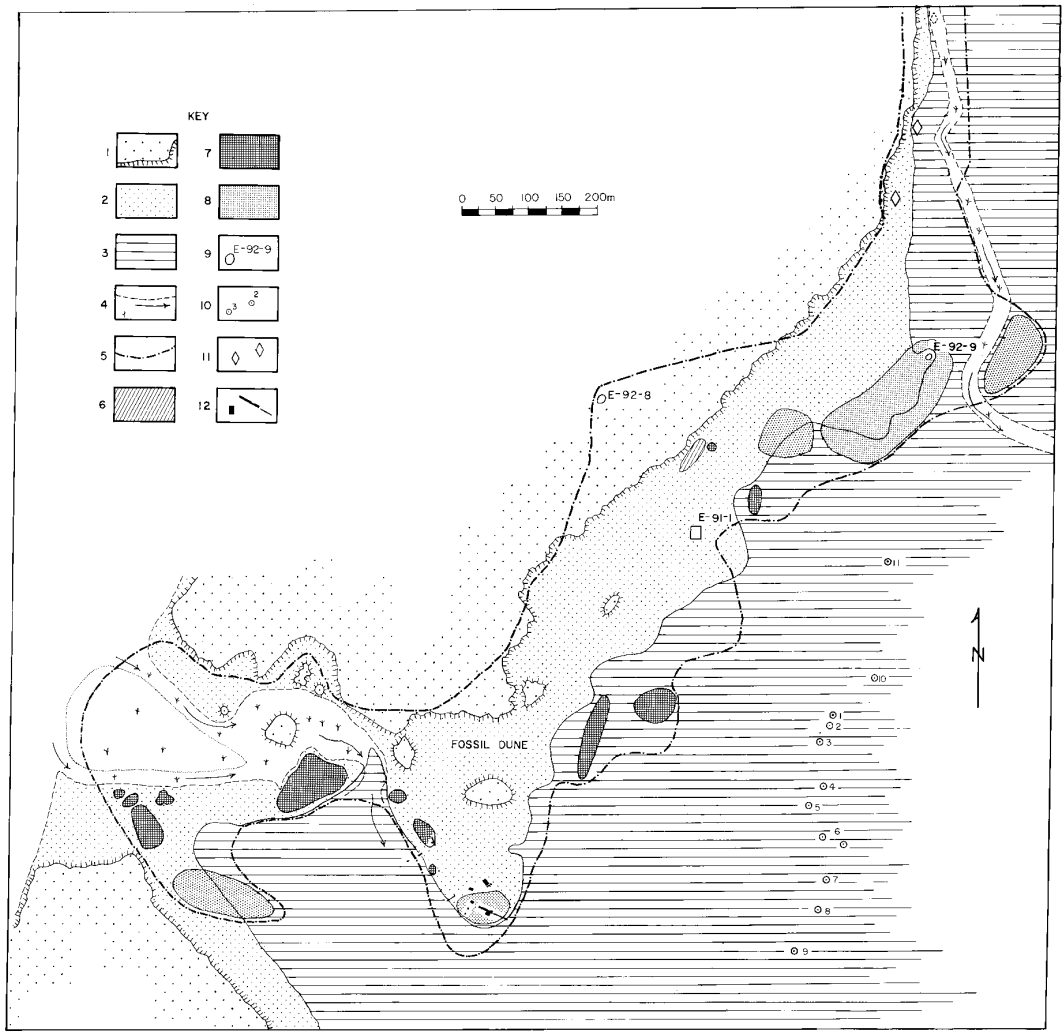

FIG. 3. Plan of the large ''aggregation'' locality, Site E-75-8, on the north beach of Nabta Playa. 1, Sandstone bedrock; 2, windblown sand; 3, playa deposits; 4, wadi channels; 5, limits of cultural debris; 6, Early Neolithic artifact cluster; 7, Middle Neolithic hearth mounds; 8, Late Neolithic hearth mound areas; 9, ''calendar circle''; 10, megalithic alignment; 11, tumuli with cattle burials; 12, excavation trenches.

The Late Neolithic (7500–6200 cal B.P.)

The Middle Neolithic came to an abrupt end with a major period of aridity that began around 7600 cal B.P. and lasted for perhaps 100 years. During this arid episode the water table fell several meters, the basins were reshaped, and their floors deflated, in some instances by more than 3 m. Insofar as we can tell, the Nubian Desert was not occupied during this dry period. When the area was reoccupied a few years later, around 7500 cal B.P., the sites are larger (except for the many small herding camps on the plateaus) and often reoccupied several times, but evidently

not for extended periods. These Late Neolithic sites contain numerous shallow, oval, stone-lined and stone-filled hearths, but there are no traces of houses. Stemmed and concave based, bifacially flaked projectile points are common in these sites, which may indicate increased regional instability. There is also a new lithic technology that made extensive use of short, wide (''side-blow'') flakes, often used as blanks for scrapers, complex notches, and denticulates, and a new kind of sand or fiber tempered pottery with burnished exteriors and smudged interiors. Impressed or incised designs are rare and limited to the rims (Banks 1980: 306–307). This new pottery is very similar to that found in the early Baderian and Abkan Neolithic along the Nile, where they are dated between 7200 and 6200 cal B.P. (Nordstrom 1972: 250–251; Hassan 1985). The source of the Abkan and Baderian Neolithic is unknown, but it was probably derived ultimately from Southwest Asia, possibly by way of Sinai, where prepottery and pottery Neolithic sites have been dated between 11,000 and 9000 cal B.P. (Bar-Yosef 1985). It is interesting to note that Terminal Paleolithic fishing and hunting groups were living in the Nile Valley as recently as 8100 cal B.P., apparently with very limited contact with the Neolithic groups living in the nearby desert (Wendt 1966; Vermersch 1978; Wendorf and Schild 1976: 163–182). This changed with the Late Neolithic.

The same Middle Neolithic ''aggregation'' locality at Nabta (Site E-75-8) was also occupied during the Late Neolithic, again presumably during the wet season, because the occupational horizons continue to interfinger with playa sediments along the edge of the beach. Apparently activities here during the Late Neolithic were similar to those that occurred during the Middle Neolithic. In addition to extensive and repeated occupations along the high beach line of the playa that resulted in numerous bones of both large and small livestock left in the trash deposits, our interest in this locality as a ceremonial center during the Late Neolithic was greatly enhanced by the discovery of a north–south oriented alignment of nine large sandstone blocks, set about 100 m apart, and partially imbedded in playa sediments near Site E-75-8 (Wendorf et al. 1994). Also, beyond the north end of the alignment there was a ''calendar circle'' of smaller sandstone slabs, which may have had astronomical functions (Malville et al. 1998).

The potential importance of this locality as a ceremonial center was further emphasized by the discovery of several small stone-covered tumuli containing the remains of cattle, seven of which have been excavated (Fig. 4). One contained a complete young adult cow buried in a clay-lined and roofed chamber below the mound (Fig. 5); six others have yielded the partially disarticularled remains of cattle scattered among the rocks, with probably more than one animal in each tumulus. All of these small tumuli are located along the western edge of the largest wadi entering Nabta Playa from the north, which with a bit of tongue in cheek we have named the ''Wadi of Sacrifices.'' These cattle burials and offerings appear to indicate the presence of a cattle cult. Both the stratigraphic and radiocarbon evidence place these cattle tumuli at the beginning of the Late Neolithic wet interval, around 7500–7400 cal B.P.

The discovery of the cattle burials led us to reconsider how these Saharan cattle pastoralists may have functioned in the Sahara. Cattle require water at least every third day and ample grass for food. For this reason modern cattle pastoralists living in areas that receive such limited rainfall as even the most optimistic estimates for Nabta rarely aggregate into large groups, and when they do, they gather in the driest time of the year near the few

FIG. 4. View of small rock-covered tumulus before excavation. Below the rocks was an oval, clay-lined chamber containing the burial of a complete young cow.

wells with permanent water. It is during this period that group ceremonies are performed (and thus different from the indicated season of ceremonial activities at Nabta).

In areas of such limited and highly seasonal rainfall, cattle pastoralists require an extensive range to ensure adequate grazing and access to water for their herds. In the Sahelian and Saharan zones of North Africa, this generally means a north–south pattern of movement. There is more rainfall in the southern parts of most areas, and these pastoralists move to these wetter areas during the driest time of the year and send their herds northward at the onset of the summer rains. The pastoralists at Nabta had another option: they could move to the Nile Valley during the dry season. The earliest Neolithic groups, who do not seem to have dug wells, may well have gone to the Nile during the driest period of the year (Wendorf et al. 1984). However, during the final phase of the Early Neolithic and the Middle Neolithic, both of which have distinctive ceramics, there is no evidence of such pottery or sites that might be Saharan Neolithic in the Nile Valley between the First and Second Cataracts. Thus, despite our logical expectations, the Nile Valley may not have been a regular part of the seasonal round during the Middle Neolithic. This does not rule out the possibility that the Valley might have been used during periods of extreme drought, when the Nile was the only available water. Such refuge sites, if they exist, could be very difficult to detect.

In the Late Neolithic there are many similarities in the ceramics between the Sahara and contemporary or perhaps slightly later sites along the Nile. Therefore, it is highly likely that settlements of Saharan groups might not be identified in a preliminary survey, and for this reason an east–west seasonal round during this period cannot be ruled out. On the other hand, the deep wells dug in the lowest part of the Saharan playas also suggest that groups occupied this part of the desert during at least part of the dry sea-

son. Even so, there must have been significant seasonal movement, because cattle will rapidly exhaust the nearby grazing in such an environment, even when water is available in wells. The settlements of the Middle and Late Neolithic cattle pastoralists at Nabta must have been brief.

The potential significance of Nabta as an early regional ceremonial center was further strengthened by the discovery of three groups of megalithic structures located on an extensive and relatively high remnant of Middle Neolithic playa sediments along the western edge of the Nabta basin. There are approximately 30 of these ''structures'' in the largest group in an area 200 m wide and 500 m long (because some have been disarranged and others resemble bedrock outcrops, the exact number cannot be determined without excavation). Each of the ''structures'' consist of several large, roughly shaped sandstone blocks set on edge to frame an oval area about 5 to 6 m long and 4 to 5 m wide, in the center of which is a large, north–south oriented, rectangular slab (ca. 2 $\times$ 1.5 $\times$ 0.4 m). An interesting feature of all three ''megalithic structure localities'' is the complete absence of other associated cultural debris, which is highly unusual for the Nabta Basin, because most other similar areas are littered with deflated hearths and lithic artifacts. While generally similar, there are also interesting differences. One of the structures is larger than the others and is set apart. Others are relatively small and occur in tight interlocking groups of up to eight units. Most of the structures occur in loose groups of three or four units placed from 2 to 3 m apart and never touching. Some of this last group are large, approaching the size of the isolated largest structure.

Test excavations at three of these structures yielded evidence of elaborate work in stone far beyond that which was expected. One of them, the largest, is of particular interest. It had two large flat, hori-

FIG. 5. The young cow buried in the chamber below the small rock-covered tumulus.

zontal central stones with a third large pyramid-shaped boulder resting on them. All had their long axes aligned slightly west of north–south. The central element was surrounded by large boulders set upright on edge. Some of the stones had been carefully shaped with wedges and weighed up to one and half tons. We expected to find a burial pit below the central stones; instead there was only a lens of finely laminated sand and silt, resting on disturbed Middle Neolithic playa sediments, strongly modified by repeated submergence and drying, which destroyed all traces of bedding in the original playa deposits. However, it was evident that a large pit had been dug into the earlier playa sediments and then refilled before the surface architecture was erected. In time the fill in this pit began to settle, leaving a shallow basin which was filled by thin lenses of laminated sand and silt.

At a depth of slightly more than 1 m below the surface and off-set slightly from the center of the surface architecture was a large, carefully shaped stone that at first was thought to resemble the keel of an upside-down boat (Fig. 6), but when placed upright, it looks vaguely like an animal, possibly a cow. The long axis of the sculpture was oriented north–south, and at the north end was a rough fan-like projection, like the head of an animal or person. It is slightly more than 2 m long, 1.25 m wide, and 0.5 m thick, and it weighs about 2.5 tons. One side of the stone is convex, the other is flat; both of the upper sides are carefully smoothed, but the two under sides are rough and unshaped.

Centered under the ''sculpture,'' and the surface architecture, at a depth of 3.5 m below the surface, was a large bedrock mushroom-shaped table rock (Fig. 7). The table rock also had been carefully shaped and worked into a circular outline with smoothed, recurved sides and a flat, smooth surface on top (Fig. 8). It has two projections about 40 cm wide, one to the north, and the other to the southwest. It was expected that a tomb might be associated with the table rock, particularly beyond the north projection where there were large elongated stones standing upright in the fill; however, excavation showed no trace of pit or tomb (Fig. 9).

Two other megalithic structures have been excavated, and two others tested by drilling. All are basically similar in their general characteristics; all built over table rocks but only the large isolated one contained a sculpture. How they managed to determine the presence of the table rocks buried from 2 to 3 m deep in heavy playa clays and silts is unknown. They may have been found by digging pits or by probing with long sticks while the clay was soft after rains. The function of the structures is not clear. It is possible that they are shrines, but we suggest that they are ''proxy tombs,'' erected to honor elite members of the group who died elsewhere during their seasonal movements ''on the trail.'' If so, these structures may indicate differences in social rank, with an elite ''family,'' or kin group represented by the clustered structures, a class of higher ranking individuals by the groups of larger structures, and a yet higher ranked individual by the isolated structure.

These limited excavations at these megalithic structures indicate the presence of elaborate and previously unsuspected Late Neolithic ceremonialism. Although the degree of social control involved is not as yet established, the planning of the structures, the work required to quarry and transport the stone sculpture, the effort used to dig the 5 to 6 m in diameter pits, and the time demanded to shape the sculpture and the underlying table rocks, represent efforts and social expenditures far beyond that expected from the seemingly simple cattle pastoralists represented in the living sites.

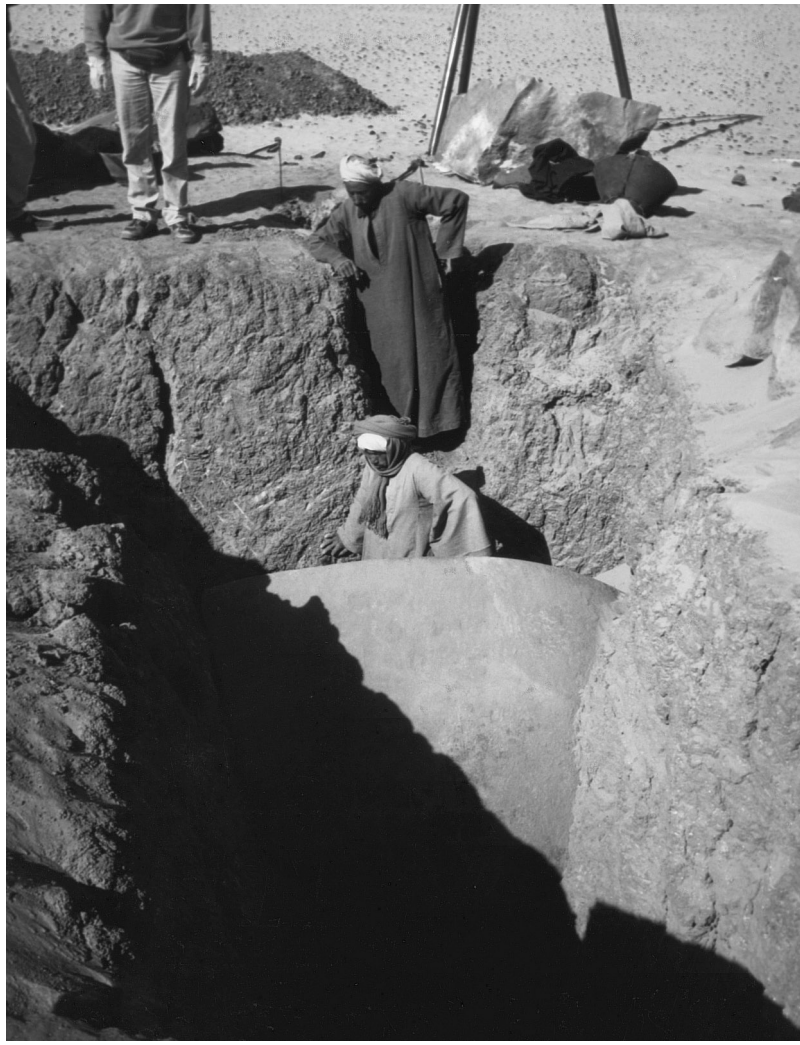

FIG. 6. Carefully shaped ''stone sculpture'' found under the Late Neolithic megalithic surface architecture. The longitudinal axis of the sculpture is oriented north–south and has an unshaped projection at the north end.

DISCUSSION

The gradual development of technologies and social systems that facilitated use of the Sahara by Neolithic groups in the early and Middle Holocene has been outlined in the preceeding pages. The presence of social systems that permitted control of the labor needed to excavate the deep wells needed to exist in the area in the driest season and possibly to determine that settlement arrangement was present as early as 9000 cal B.P. in the final phase of the Early Neolithic. Regional ceremonial and (possibly political) systems are indicated for the Middle Neolithic as early as 8000 cal B.P., with the large settlement of E-75-8 and its more frequent remains of cattle. This trend toward social complexity reaches

FIG. 7. Worked mushroom-shaped ''table rock'' found under the stone sculpture at a dept of 4 m. The upper figure is at the north projection. The north end of the sculpture was held in position by the slab to the right of the figure.

its zenith with the emergence of Nabta as a regional ceremonial center in the Late Neolithic. These developments are significant for African prehistory in two areas: first, the emergence of the African Cattle Complex (Herskovits 1926) where cattle serve to symbolize status and power, and in which regional ceremonial centers are an important component; and second, the role of African cattle pastoralists in the rise of Egyptian Civilization.

The source or sources of social complexity in Egypt has long been a topic of discussion. Initially it was believed that Egypt might have been the first to have a complex society, but radiocarbon dates have shown that Mesopotamia was earlier. It was then assumed that Egypt was the great borrower and that the concepts of complexity spread from Mesopotamia to Egypt. However, it is no longer assumed that social complexity can be borrowed or diffused from one area to another, instead social complexity is more often seen as developing from local causes. Social complexity is frequently regarded as an expression of the degree of structural differentiation and functional specialization evident in a society; a development can occur within the society when craft and other specialists emerge (because when division of labor increases, the need for control also increases), or from external forces where there are two radically different economic systems in close physical proximity, as is often found where agriculturists with a centralized political system have close relationships with pastoralists. These two processes of structural differentiation are not mutually exclusive, but mutually supportive. The pastoralists usually live in tense harmony with their

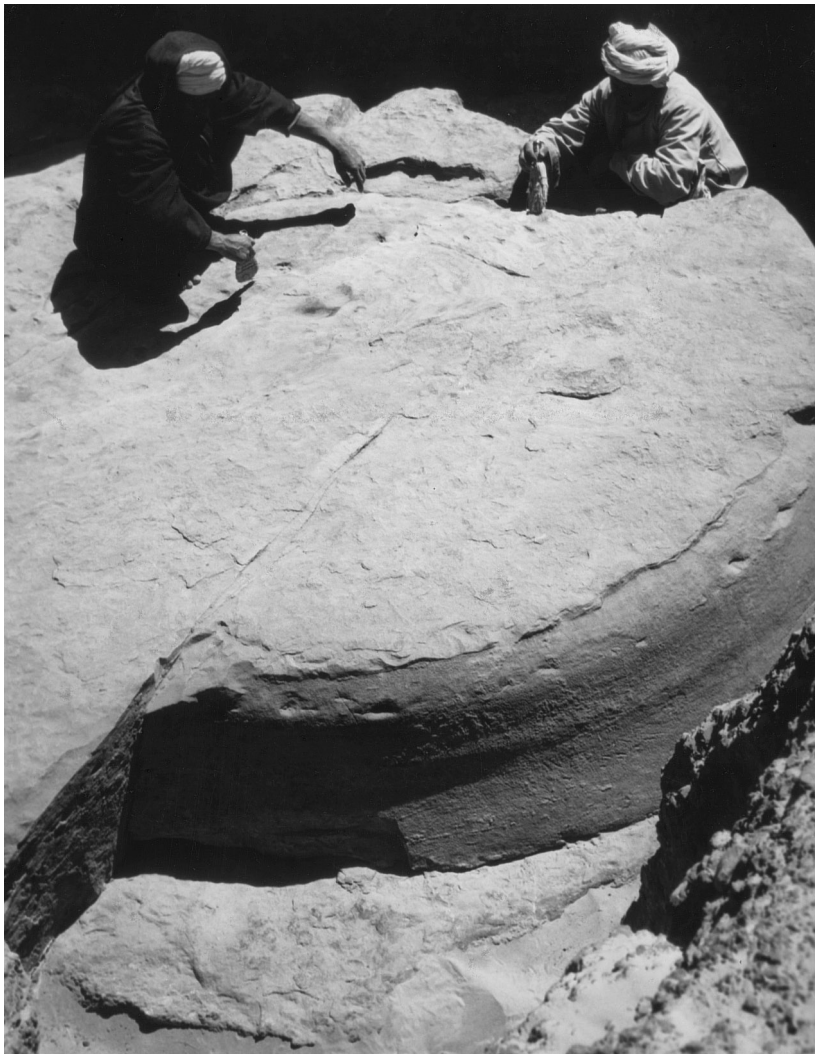

FIG. 8. Worked mushroom-shaped table-rock, showing carefully shaped sides. View is looking southeast. The area below the mushroom stone has yet to be excavated.

village neighbors, but from time to time they will take advantage of a weakness and take control. It is in this setting that the Late Neolithic cattle pastoralists and their regional ceremonial center at Nabta is of particular interest, because it may well be that the Saharan pastoralists may have provided the basis for the external differentiation that stimulated the emergence of social complexity in Egypt.

Ceremonialism in Predynastic and Old Kingdom Egypt

One of the interesting aspects of the Nabta center is its possible role as a contact point between the early Nilotic Neolithic groups with their agricultural economy and the cattle pastoralists in the Egyptian Sahara. The functional separation of these two different economies may have played a significant part in the emer-

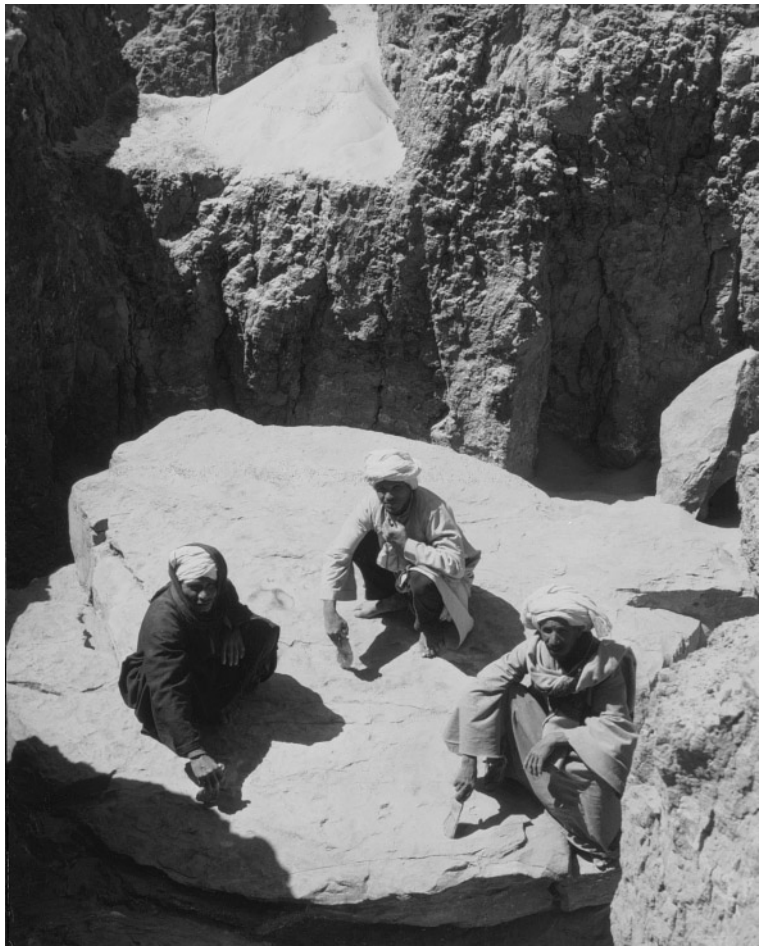

FIG. 9. View of worked mushroom-shaped table-rock looking west. Note one of two large losenge-shaped stones standing near vertical behind and to right of workmen. The positions of these stones suggest the possibility of a shaft.

gence of complexity among both groups. The evidence for Nilotic Egyptian influence on Saharan pastoralists is not extensive and is presently limited to Late Neolithic ceramic technology, occasional shells of Nile species, and rare stones from the Nile gravels. Another way of exploring this is by examining those aspects of political and ceremonial life in the Predynastic and Old Kingdom that might reflect impact from the Saharan cattle pastoralists. In this we have been preceeded by Frankfort (1978: 3–12) who, in his major study of Egyptian and Mesopotamian religions and political systems, argued that the Egyptian belief system arose from an East African substratum and was not introduced from Mesopotamia. To support his position Frankfort pointed to the similarities in religious beliefs the early Egyptians shared with Nilotic cattle pastoralists. During the Old Kingdom, cattle were a central focus of their belief system. They were deified and regarded as earthly representatives of the gods. A cow was also seen as the mother of the sun, who is sometimes referred to as the ''Bull of Heaven.'' The Egyptian pharaoh was a

god (similar to the Shillok king, and not an intermediary to the gods as in Mesopotamia). He was the embodiment of two gods, Horus, for Upper Egypt, and Seth, for Lower Egypt, but he was primarily Horus, son of Hathor, who was a cow. Horus is often depicted as a strong bull, and images of cattle are prominent in Predynastic and Old Kingdom art; in some instances the images of bulls occur with depictions of stars, a concept that goes back to the Predynastic (Frankfort 1978: 172). Dead pharaohs were sometimes described as the Bull in Heaven. Another important Old Kingdom concept was Min, the god of rain, who is associated with a white bull, and to whom the annual harvest festival was dedicated.

It is interesting to note that the emphasis on cattle in the belief system of the Old Kingdom is not reflected in the economy. While cattle were known and were the major measure of wealth, the economy was based primarily on agriculture and small livestock—sheep and goats. Frankfort saw this emphasis on cattle as an indication that the Old Kingdom beliefs were part of an older stratum of East African concepts. It seems likely, however, that had Frankfort known that cattle pastoralists were in the adjacent Sahara several thousands years before the Predynastic, he would have seen the Western Desert cattle pastoralists as the more likely source for the Old Kingdom religious beliefs than the East African pastoralists. Moreover, that cattle were not important among the preceding Neolithic in the Nile Valley suggests that the Old Kingdom belief system was imposed from outside, perhaps in the traditional fashion, a conquest by pastoralists who periodically come in from their ''lands of insolence'' to conquer farmers (Coon 1958: 295–323; Khazanov 1994). It is tempting to suggest that the impressive cattle burials at the A-Group site of Qustul (Williams 1986), in Egypt south of Abu Simbel, may relate to just such an event.

Ethnographic Data Relating to Regional Ceremonial Centers

The Nabta cattle pastoralists and the proposed regional ceremonial center also may contribute to a better understanding of the origins of the African Cattle Complex. One of the aspects of the modern African Cattle Complex is the regional ceremonial center for groups that are divided into sections or lineages. These centers serve as foci of religious, political, and social functions for the entire group. Similar regional ceremonial ceremonial centers occur widely in Sahelian and Subsaharan Africa, but they are usually assigned to the Iron Age or later. The evidence from Nabta suggests that regional ceremonial centers probably have a much greater antiquity in Africa than has previously believed and suggests that we should reconsider such a late date for the beginning of this phenomena. The megalithic alignments, cattle tumuli, and cattle consumption at Site E-75-8 all indicate that the Nabta Basin was a ceremonial center, but it has not been confirmed that this center served to integrate separate groups, sections, or lineages.

Many African cattle pastoralists, such as the Habana and Beni Helba Baggara tribes, who live in the hyperarid area of northern Darfur, and the Gura'an in adjacent Chad have economies in which hunting and gathering are significant; or they supplement their cattle resources and gathering activities with a symbiotic relationship with a group of hunters who provide meat (Nicolaisen 1968). Another solution is found among the Baggara tribes in northern Kordofan, who not only gather plant foods, but also use drought-tolerant camels as well as cattle (Asad 1970; Lampen 1933; Seligman and Seligman 1918). A few pastoralists also culti-

vate gardens (Cunnison 1966). The cattle pastoralists at Nabta also must have had some dependence on hunting and gathering, and perhaps even gardens, as the associated faunal and floral remains indicate.

Unfortunately for our purposes, the modern cattle pastoralists living 500 to 800 km south of the Egyptian border, in northern Darfur and Kordofan, such as the Gura'an, Kababish, and Baggara, who might be expected to share many burial and religious features with the Nabta group, are Moslems, and traces of their earlier beliefs are scant (Asad 1970; Lampen 1933; Seligman and Seligman 1918). Nevertheless, the tribes living in northern Darfur use cattle for bride payments, to settle blood debts, and to determine wealth and prestige; they never kill cattle for their meat except on ceremonial occasions. Although most groups live in the desert throughout the year, the Baggara who live in northern Kordofan have strong ties with the Nubians living along the Nile near Dongola, and during periods of extreme drought they move to the river.

The political structures of the northern Darfur tribes usually include an overall tribal leader whose position is inherited in the male line, and who has final authority over all disputes and issues regarding the well-being of the tribe, but the authority of these leaders is limited, largely because the tribe is divided into territorial lineages which can function independently. Strong leaders seem to have emerged only at times of special need, such as warfare or other crisis, and do not seem to have been able to maintain that authority after that emergency had passed. Each lineage has a leader who is responsible to the tribal leader and whose position is also inherited. Probably because of their Moslem beliefs, the ceremonial life of these northern Sudanese tribes does not appear to emphasize rain-making, although lineage and tribal leaders sometimes conduct simple ceremonies seeking rain. There are shrines or sacred places, but very little is known about them.

Almost all of the animastic tribes living farther south, along the Upper Nile, are cattle pastoralists. Cattle dominate their lives: they are their primary wealth; they are used to pay bride-payments and blood fines, and they are the basis for prestige. Among most of these groups the rain-makers are the most common religious figures. These rain-makers derive their power from ancestral spirits and may be either the embodiment of their high god or, more frequently, serve as an intermediary with that god to bring rain, so the grass will grow and their cattle will flourish. The rain-maker is usually the most important person in the tribe; he resolves disputes as the final authority, and he is responsible for all public life. Most are also wealthy, and there is a documented case where an unusually powerful Nuer ruler sacrificed numerous cattle and covered them with an earthen mound to demonstrate his importance and wealth (Herskovits 1926: 28). The power of these rain-makers is limited and they also live precarious lives; they are often killed when rain fails to come, and they are also killed when they become ill or grow old before they lose their power. On the other hand, some of the East African cattle pastoralists, such as the Shilluk, who lack rain-makers (Seligman and Seligman 1932), are led by a king who is regarded as the embodiment of their god. These kings have much greater power and they usually control larger groups than the rain-makers.

Many of these tribes in the Upper Nile build earthen tumuli, some of which are still in use. They serve as deliberately constructed regional centers for groups that are divided into sections or lineages. Because they are the foci of religious, political, and social functions for those groups, these regional centers serve to bond the

lineages together. These centers are also associated with themes of sacrifice, death, and burial (Johnson 1990). In some instances they become the focal point of royal rites and the royal capital itself (Howell and Thompson 1946), although most of them seem not to be connected to a particular settlement. In some instances the shrines include mounds built over sacrificed cattle, while other mounds cover burials of prominent leaders (Bedri 1939: 131; Howell 1948: 53). There are historic records that retainers were sometimes buried with these leaders (Johnson 1990: 49). Myths associated with these regional centers also serve to define the territorial claims of the groups identified with the shrine and to legitimize the authority of those with spiritual power (Leinhardt 1961: 98).

An excellent example of the role played by these mound-shrines today is provided by a modern Dinka shrine, built on the border between several tribal groups, that has become a focal point and national symbol for the Southern Sudanese Liberation Movement (Johnson 1990: 53). Another example built in the early part of this century, was erected when an unusually powerful Nuer prophet stimulated the construction of a huge conical earthen mound, 100 m in diameter and 15 m high, and surrounded around the base with numerous elephant tusks (Evans-Pritchard 1956: 305–306; Seligman and Seligman 1932: 231). Evidently this was done by volunteers over a period of many years without conscripted labor.

There are many other kinds of shrines used in this area, most of them simple decorated poles, referred to as ''mobile shrines,'' but among the Bari and the Lotuko the rain-maker shrines consist of a circle of large upright stones with a mosaic of smaller flat stones in the center (Seligman and Seligman 1932: 288; 330). The Nuba also have circles of large upright stones with smaller flat stones in the center that are used by the men when they perform the new fire ceremony (Seligman and Seligman 1932: 343–344), while among the Kalenjin in Kenya, tribal elders sometimes sit against upright stones set in a circle (Posnansky 1966).

Most of the modern Nilotic cattle pastoralists bury their dead in simple, shallow graves with a small decorated stick or pole shrine nearby. Cattle are sometimes sacrificed as part of the ceremony, particularly for their leaders and the wealthy. Burial among the Nuba and the Moro, however, is in chambers from 2 to 3 m below the surface and about 2.5 m in diameter that are reached by shafts dug from the surface (Seligman and Seligman 1932: 404 and 486).

Some Archaeological Ceremonial Centers

The archaeological literature for Sahelian and Sub-saharan Africa record numerous presumed regional ceremonial centers with megalithic alignments, burial mounds, and stone circles similar to, but not identical with, those at Nabta. These ceremonial centers occur from Ethiopia to Senegal and north to the Maghreb (Camps 1953; Connah 1987; Desplagnes 1951; Fergusson 1872; Joussaume 1974, 1985; Milburn 1988; Tilner 1981). They are particularly abundant in West Africa where there are literally thousands of tumuli and megaliths (Martin and Becker 1974, 1984). Only a few of these tumuli and megaliths have been dated, but they are usually assigned to the Iron Age or later. There are two older, but rejected radiocarbon dates of 7440 and 6700 B.P. associated with megaliths in the Central African Republic (Vidal 1969, Bayle des Hermens 1975: 260–261).

The archaeology of the Sahara in northern Sudan is little known (Kuper 1986; Richter 1989; Schuck 1989), but near Malha Crater in northern Darfur

there are numerous earthen mounds, some of which are very large, indicating that a rich ceremonial and burial complex existed there in the past. Many of these mounds occur near large, late prehistoric ''cities'' that are segmented into distinct units and special precincts. The arrangements of the towns suggest multiple sections or lineages. Very little work has been done at these sites, but they are tentatively dated between 3000 and 4000 B.P., when the lake sediments in the crater indicate an interval of greater precipitation (Dumont et al. 1993). Of interest here is the erection of burial mounds in special precincts away from the settlements, which resembles the situation of the megalithic structures at Nabta. These Malha sites could well have served as regional ceremonial centers. It is also useful to note that these settlements indicate, at the very least, that large and complex groups could function successfully in areas of very limited rainfall, but we do not know if they were farmers or mixed farmers and pastoralists.

A Final Comment

Around 6200 cal B.P. the modern phase of hyperaridity began in the Eastern Sahara and the area was abandoned. It has been suggested that the movement of these perhaps better organized Late Neolithic cattle pastoralists to the Nile Valley, and the resulting turmoil, was a critical factor in the rise of social complexity and the subsequent emergence of the Egyptian state in Upper Egypt (Hoffman 1979; Hassan 1988). If so, Egypt owes a major debt to those early pastoral groups in the Sahara; they may have provided Egypt with many of those features that still distinguish it from its neighbors to the east. While tempting, this hypothesis must be viewed with caution. Many features which characterize the ceremonial aspects of the regional center at Nabta are as yet unknown in the Nile Valley. These include the megalithic alignments, the megalithic structures and worked table rocks, cattle burials in chambers built in stone-covered tumuli, and calendar circles. One of the fascinating aspects of the evidence for the working of large stones is that it seems to anticipate later Egyptian developments. If the Saharan people contributed significantly to the rise of complexity in the Predynastic, the precise nature of those contribution has yet to be defined.

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