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Sedentism and the advent of food production in and around Dakhleh Oasis in the Western Desert of Egypt: a distinctively African phenomenon

Introduction

Melinda Zeder (2008), reviewing evidence concerning the emergence of the Neolithic way of life in the Near East and its spread across the Mediterranean Basin, characterizes North Africa as essentially *terra incognita* in this regard. The area's obscurity in this matter may not, as Zeder suggests, simply be a question of insufficient research into the question. Arguably, the region never experienced a Levantine-style Neolithic Revolution. Instead, Northeast Africa, beyond the Nile Valley and away from the coast, seems to have followed what Marshall and Weissbrod (2011: S408) call a "distinctive African pathway toward food production":

"Animals were domesticated before plants, herding populations became more mobile than their forager ancestors, the subsistence system was characterized by a few morphologically wild domesticates (e.g. the donkey), a wide range of wild resources in ecodiverse combinations continued in use, and mosaics of hunter-gatherers and herders occupied varied regions. Pastoralism developed early in the arid topics, whereas the beginning of farming based on domesticated plants was late."

To explore the degree to which the area conforms to an African pattern of neolithisation, this paper will focus on the evidence from the great oases of the Central Western Desert of Egypt (Fig. 1). Over 30 years of fieldwork on the early to mid-Holocene archaeology has revealed a rich record concerning the origins and development of food producing cultures in Dakhleh Oasis and neighbouring areas (McDon-

ald 1999). Arguably, the most remarkable feature of the archaeological record for this period in Dakhleh Oasis – and the same pertains to the other area I have been working, the Plateau edge and Escarpment face above Kharga Oasis (McDonald *et al.* 2006) – is the degree of sedentism found in both the early and mid-Holocene, evidenced by the presence of clusters of slab structures (McDonald 1991; 2003; 2009).

When studies on the advent of food production began in earnest after World War II, initially in the Near East, sedentism was considered one of a bundle of traits that also included plant and animal domestication, pottery and ground stone, a ‘Neolithic Package’ that emerged roughly simultaneously. The assumption was that settled life could not have developed without the secure resource base provided by domestic foods, and conversely, that one had to settle to protect the growing crops, and to store and utilize the bulky harvest (Hitchcock 1982; Marshall 2006). In that sense, the Iraqi site of Jarmo, excavated in the 1950s by a pioneer of Neolithic studies, R. J. Braidwood, was the ideal Neolithic site, with good solid mud-walled architecture, both plant and animal domesticates, and with pottery and ground stone (Braidwood and Howe 1960; Braidwood 1967). Now, even in the Near East, the notion of a Neolithic Package is badly eroded, with evidence for sedentism appearing long before the advent of food production. The Natufians of the Levant, late Epipalaeolithic complex foragers, appear to have been fairly settled on sites featuring stone-built structures, burials, heavy grinding equipment and so on (Bar-Yosef 1998; Goring-Morris and Belfer-Cohen 2003). Furthermore, in the subsequent Pre-Pottery Neolithic A (PPNA), with emerging evidence of sites with elaborate ritual or special-purpose buildings, groups seem to have been still largely reliant on wild foods (Finlayson *et al.* 2011; Schmidt 2012).

In Dakhleh Oasis, it is not just a question of increased sedentism appearing long before the advent of food production in the area. Ironically, for the first cultural unit for which we have solid evidence of food production, *Bashendi B*, groups abandon the settled life to become mobile herder-foragers. In the balance of this paper, I will briefly review the archaeological record for early to mid-Holocene Dakhleh, and to some extent for Kharga Oasis, highlighting the changing relationship between sedentism and mode of subsistence, whether based on wild or produced foods.

The early to mid-Holocene record for Dakhleh and Kharga Oases

Three cultural units have been defined within the Dakhleh early to mid-Holocene record: the *Masara* or Epipalaeolithic, dated ca. 8300-6500 cal BC, the ‘Neolithic’ *Bashendi*, subdivided into *Bashendi A* (ca. 6400-5650 cal BC), and *Bashendi B* (5400-3800 cal BC), and the *Sheikh Muftah*, which may have spanned over 1500 years, extending into Old Kingdom times ca. 2200 cal BC.

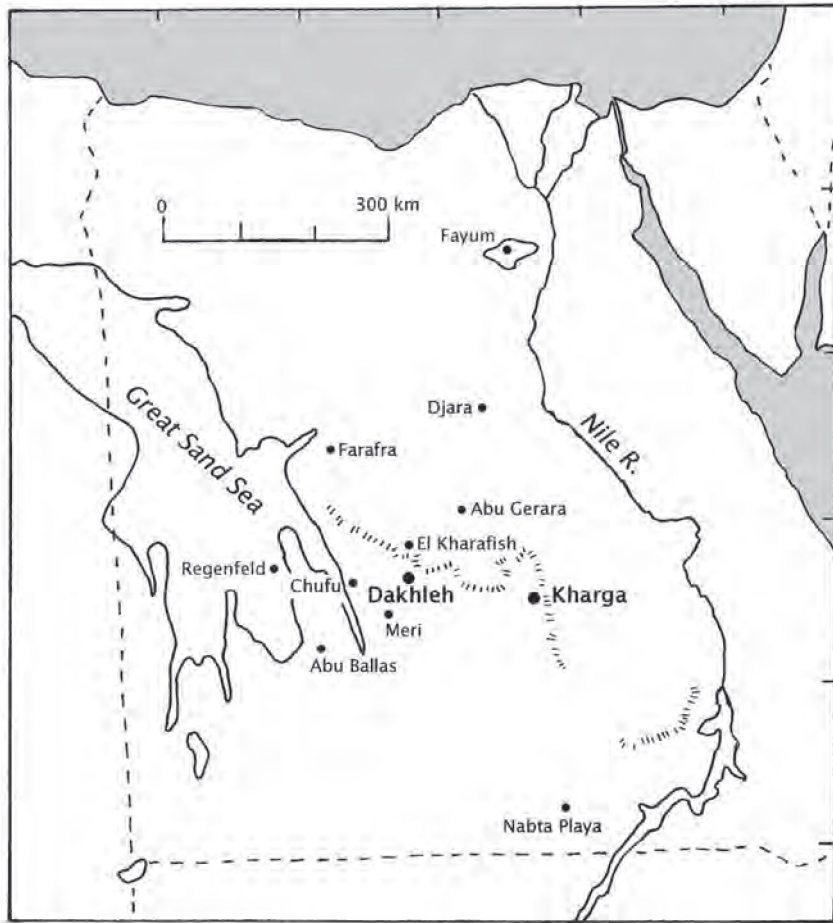


Fig. 1. Map of Egypt with main sites mentioned in the text

The early Holocene Masara

The Masara Unit is divisible into two main groups, A and C, on the basis of both artefact inventory and site type, *Masara C* (ca. 8050-7500 cal BC) being the more sedentary (McDonald 2003). *Masara C* sites are largely confined to a spot in southeastern Dakhleh, well beyond the extant oasis. Most of the 20 recorded localities consist of clusters of apparent structures, with the largest boasting up to 20 units. *Masara C* structures are rings of stone, typically round or oval, a few crescent-shaped, generally two to four meters in diameter, and often semisubterranean. Surface remains usually consist of a single tier of vertical sandstone slabs, which can stand three to four slabs thick in places. Various lines of evidence, the structures themselves, the expedient use of local lithic raw materials, a diverse and specialized lithic toolkit, and evidence for a number of other activities, all suggest a somewhat sedentary population (McDonald 1991). Heavy grinding equipment is present, including both slabs and handstones, but no pottery has been found.

There is no evidence of food production at these sites. They appear rather to be the base camps of 'collector' groups (Binford 1980; 1990) focusing on a broad spectrum of local resources. Faunal remains (Churcher *et al.* 2008) range from hartebeest, gazelle and hare, to ostrich and smaller (wading?) birds, to tortoise, lizard and toad. In the case of ostrich, they were feasting on both the bird itself and the eggs. Palaeobotanical remains (Thanheiser 2011) consist of both charcoal and plant macrofossils. From the charcoal, thirteen species of trees and shrubs were identified, including six that could be classified as southern or Sahelian elements. Macrofossils are from plants that grow in marshy areas, others such as sedges that grow abundantly after rains, and small-seeded legumes. Grasses are relatively unimportant, and there is no evidence for the use of tubers.

The faunal and palaeobotanical evidence suggesting a fairly wet environment in SE Dakhleh Oasis stands in sharp contrast to that from the rest of the Western Desert, which seems to have been in the grip of a sharp dry episode ca. 7900-7600 cal BC (Hassan 1996; 2002: fig. 2; Wendorf *et al.* 2001: 649). It would appear therefore that *Masara C* groups were pushed into settling in what may have been a small well-watered refuge within an otherwise suddenly reconstituted desert (McDonald 2009). Whatever the cause of the increased sedentism on the *Masara C* ridge, the area seems to have continued to attract settlers for over a millennium, long after conditions improved and campsites were again widely dispersed across the desert (McDonald 2007).

In Kharga, high above the oasis floor in the Midauwara embayment under the rim of the Libyan Plateau, there seems to have been a similar episode of increased

sedentization roughly contemporary with Masada C. Site MD-43, for instance, boasted about 20 slab structures, and a lithic toolkit very similar to that of Masada C (McDonald 2009). It is interesting to note that Masada C-like assemblages have been recorded on the oasis floor in Southern Kharga, but on what appear to be open-air sites without slab structures (Briois and Midant-Reynes 2010, 46). For the sites in Midauwara, we have as yet no organic remains to inform on subsistence.

The Late Bashendi A Unit

In Dakhleh Oasis, the next major episode of increased sedentism is associated with the Late Bashendi A in the mid-Holocene, ca. 6000-5650 cal BC. Occupation is again in the same area of SE Dakhleh, but conditions seem considerably more humid, with perhaps a bimodal (winter-summer) rainfall pattern (Goodfriend 1991; Neumann 1993; Arz *et al.* 2003). The number, variety and size of at least some sites increased dramatically. The largest, in fact the largest site recorded anywhere in NE Africa for this time, is Loc. 270, with 200 slab structures. Structures come in a variety of shapes and sizes, and appear to form clusters, perhaps reflecting social groupings (McDonald 2008). Excavation suggests a somewhat complex life history for the site, with individual structures abandoned and reoccupied, and activity areas shifting over the life of the site which, according to a suite of radiocarbon dates, could have spanned 900 years. Other sites with structures in the vicinity of 270 include a pair of much smaller, probable special purpose sites, Locs 306 and 307, and Loc. 269, a large stone ring measuring 48 x 35m. Grinding equipment, both slabs and handstones, is common on these sites. Pottery, in the form of a few small, thin-walled vessels, is present throughout the Bashendi A phase.

Organic remains recovered so far from Bashendi A suggest an intensive focus on strictly wild resources. Faunal remains are of game animals such as gazelle, a large bovid, a small carnivore, and three sizes of bird including ostrich (Churcher *et al.* 2008). As for plant food, the dicots and sedges that dominated Masada C samples are still present, but grasses are now the dominant group, with wild sorghum and several millets prominent in the assemblage. The macroremains also include a wide range of other food and medicinal plants, plus others that could be used as animal feed, fuel, or as raw material for technical purposes (Thanheiser 2011).

Despite the lack of evidence in the faunal collection, it seems likely that herding was practised in the Late Bashendi A. Domesticates, both cattle and sheep/goat, were by now present elsewhere in the Western Desert – at Nabta Playa, at Djara to the NE of Dakhleh, and at Farafra Oasis (Wendorf *et al.* 2001; Barich and Lucarini 2008; Kindermann 2010). The site layout at Loc. 270, and the presence in Late Bash-

endi A toolkits of implements elsewhere associated with pastoral groups, items such as scrapers on side blow flakes and of tranchets or planes, argue for the presence of herds or flocks (McDonald 2009). Loc. 269, the large stone ring, could have served as an animal kraal, although other functions are also possible.

In Kharga Oasis on the Escarpment face, there are mid-Holocene settlement sites that seem roughly contemporaneous with the Late Bashendi A. At Midauwara, site MD-18 consists of about 80 structures, most of them of mid-Holocene age (McDonald 2009). Loc. MD-24 is a much smaller site consisting of about 10 structures. Both yield Late Bashendi A-like artefact assemblages. Again though, as with the early Holocene sites, we have no information on subsistence.

The two large oases of the Central Western Desert seem unique in the area, in their possession in both the early and mid-Holocene of sites consisting of groups of slab structures. In Nabta Playa to the south, by the mid-Holocene, in the El Nabta/Al Jerar phase (ca. 7000-6200 cal BC), there are large sites like E-75-6 that are occupied for most of the year. They feature wells and bell-shaped storage pits, but the 'huts' are oval basins up to 30cm deep with a superstructure probably built of sticks. In the subsequent El Ghanam phase, roughly contemporary with Late Bashendi A, the few recorded sites consist mostly of large hearths, storage pits and wells. Slab structure sites do appear by Late Bashendi A times further north in the desert, around Abu Ballas to the southwest of Dakhleh (Kuper 1993) and at Meri to the west of the oasis (Riemer 2006). In the Farafra Depression to the northwest, two 'villages' have been investigated, one in Hidden Valley, with at least 10 slab structures, the other in the Sheikh el-Obeiyid area, with 25 structures (Barich and Lucarini 2008; Hamdan and Lucarini 2013). These sites were occupied, starting about 5650 cal BC, by people exploiting wild animals and plants, notably sorghum, and herding sheep and goats.

The Bashendi B Unit

In Dakhleh Oasis, it is only with Bashendi B that there is unambiguous faunal evidence for herding. From pits in Loc. 271, for instance, there are the remains of cattle and goat (McDonald 1998; Churcher et al. 2008). Botanical remains do not preserve well, but the presence of grinding slabs and handstones probably attest to the ongoing use of wild cereals. Wild animals, such as hartebeest and gazelle, continue to be hunted. Kuper and Kröpelin (2006) characterize this adaptation as 'multi-resource pastoralism'.

Bashendi B follows Bashendi A after at most a short gap, but the settlement pattern changes dramatically: Bashendi B groups appear to be mobile herder-

foragers practising transhumance (McDonald 1998; 2002). The slab-built settlement sites are abandoned. Localities now are typically open-air sites consisting of clusters of hearth mounds and associated cultural debris. Many occupy the same Southeast Basin as Bashendi A sites, but they occur upslope, above the level of the playa silts, around the edge of the basin. Elsewhere in Dakhleh, sites have been recorded within the Central Lowlands, and atop the Plateau to the north. Beyond the oasis itself, Bashendi B groups, identifiable by their Dakhleh-made pottery and chipped stone assemblages, ranged during the rainy season onto the Abu Gerara portion of the Abu Muhariq Plateau to the northeast of the oasis (Riemer 2010, 597), and as far as 100 km to the southwest, to such sites as Meri and Chufu (Riemer 2006). Elsewhere in the Western Desert, Bashendi B-like groups have been recorded in Farafra Oasis, within the Hidden Valley, el-Bahr and Wadi el-Obeiyid areas (Barich and Lucarini 2008; Barich et al. 2012). In Nabta Playa to the south, similar mobile herder groups date to the Late and Final Neolithic phases (Wendorf et al. 2001). Distant from any oasis, the core area of the desert, lacking any permanent surface water, remained the domain of pure hunter-gatherers (Riemer 2009). Sites at Regenfild in the Great Sand Sea and others around Abu Ballas were occupied seasonally by groups hunting such dry-adapted species as gazelle, hare and addax, and grinding the seeds of wild plants. By 5300-4900 cal BC, these areas were completely abandoned due to dryness.

The dramatic shift in settlement patterns at the start of the Bashendi B is probably in part climate-related. It coincides with the increasing aridification that brought an end to the mid-Holocene humid period in the Eastern Sahara (Kuper and Kröpelin 2006).

The Sheikh Muftah Unit

Bashendi B is succeeded by the Sheikh Muftah Cultural Unit at perhaps 3800 cal BC (McDonald *et al.* 2001; McDonald 2002). Probably in response to continued aridification, the Sheikh Muftah seems more oasis-oriented, with sites located down slope from most Bashendi localities, often close to the margins of modern cultivation. Others are found on the slopes of spring mounds in the heart of the Central Lowlands (McDonald 1999, 124, fig. 7.3). But while sites are littered with heavy implements fashioned in tabular chert, and with more pottery than before, groups do not seem sedentary. The 70+ sites feature hearth mounds and fire pits, but virtually no structures. Moreover, they are not strictly confined to the oasis. The ACACIA group have recorded a number of Sheikh Muftah sites in their surveys to the north and west of Dakhleh (Riemer 2011). El Kharafish 02/5 is located

atop the Plateau some 30 km north of Dakhleh in what seems to have been, early in the third millennium BC, an unusually well-watered microenvironment. Site 02/5, its surface littered with artefacts, served repeatedly at the end of the winter rainy season as a base camp for a herder group coming from Dakhleh. There are also much smaller, probable short-term herder camps, located up to 100 km from the oasis. Even further afield, the occasional cache of Clayton rings made from Sheikh Muftah sherds may represent way stations for trans-desert travel.

The Sheikh Muftah people of Dakhleh were primarily pastoralists, keeping cattle and goats. The cattle, to judge from the maturity of most specimens, were exploited for milk and perhaps blood and/or transport, as well as meat. Wild ass or donkey bones were recovered from a number of sites, and the animal appears to have been domesticated by late Sheikh Muftah times (Churcher and Klein-dienst 2006; Churcher *et al.* 2008). Hunting continued, with prey including gazelle, hartebeest, Cape buffalo, zebra, pig and hare (Churcher *et al.* 2008). Little is known about the exploitation of plants for food. At the El Kharafish base camp, hunters of gazelle and migratory birds supplied the meat, while the flocks, grazing on fresh spring pastures, were exploited for their milk (Riemer 2011).

The Sheikh Muftah unit persisted in Dakhleh to overlap with colonists who arrived from the Nile Valley in Old Kingdom times, ca. 2200 BC.

Discussion

In summary, groups in the large oases of the Central Western Desert of Egypt appear to follow a distinctive African pathway toward food production. In Dakhleh Oasis and on the higher land above Kharga Oasis, there is a long-standing tradition, starting in the early Holocene, of increased sedentism by groups intensively exploiting localized, apparently rich, wild resources. In the early Holocene, Masara C hunter-gatherers appear to have been pushed into settling in a small, well-watered refuge within a desert otherwise in the grip of a sharp dry episode. Their mid-Holocene counterparts, the Late Bashendi A, settled fairly densely in much the same locations in both oases, but under considerably more humid conditions. They harvested and perhaps cultivated rich wild stands of sorghum and millets, and hunted gazelle and a range of other animals. It is likely that they also kept herds and flocks. By this time, sites with slab structures are recorded elsewhere in the Western Desert, including the substantial 'villages' of forager-herders in Farafra Oasis. In Dakhleh, the first unambiguous faunal evidence for the herding of cattle and goats comes from sites of Bashendi B groups who, facing the aridification that ended the mid-Holocene humid period, abandoned the

settled sites of Southeastern Dakhleh. Bashendi B camps are scattered across the oasis and beyond it in the Abu Gerara region to the northeast and the Chufu area to the west, where they spent the rainy season. Meanwhile, in the dry core of the desert, the old hunter-gatherer pattern continued. The succeeding Sheikh Muftah, in response to ongoing aridification, set up their campsites down slope towards the centre of the oasis. However, when conditions allowed, they still practised transhumance, camping atop the Limestone Plateau at El Kharafish. Throughout the mid-Holocene part of the sequence, a variety of wild foods still constituted an important element of the subsistence system.

The Neolithic of Northeastern Africa was, to some extent, an import from the Levant. Most of the animals, sheep, goat, and probably cattle, arrived already domesticated. However, the Near Eastern crop complex, wheat, barley, pulses, and flax, penetrated no further than the Nile Valley and Fayum Oasis¹ They are cool-season crops (Harlan 1992), adapted to the winter rainfall (and winter sunlight) regime of the Near East, and a similar growing season in the Nile Valley. In the desert, at sites like Bashendi A Locality 270, people were intensively harvesting wild sorghum and millets, plants adapted to the African summer monsoon rainfall pattern. These plants continued to be exploited as Bashendi B-like pastoralists spread west across the Sahara, and then southward into the Sahel and beyond in the face of continued aridification. Only there would the first African domestic crop, pearl millet, appear by ca. 2000 cal BC, at such sites as Dhar Tichitt in Mauritania and Birimi in Ghana (Neumann 2005).

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¹ A few grains of emmer wheat, which may have been imported from the Nile Valley, were recovered at Site KS043, dated 4800-4200 cal BC, in the southern part of Kharga Oasis (Briois et al. 2012).

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