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Early ceramics in the Sahara and the Nile Valley

Introduction

In the 1960's Gabriel Camps was hesitant at first in accepting the radiocarbon results dating the lower level at Amekni in which pottery was found to the 9th millennium bp (Camps 1969: 206). This early date would have made the Sahara an area of „Neolithisation" as old as the Fertile Crescent, an idea which at that time seemed to be unbelievable. However, during the last forty years the number of radiocarbon dates for Saharan sites with early pottery has increased considerably. Today, the Sahara is not only accepted as an important centre of ceramic innovation (e.g. Roset 1996: 178), but also as one of the earliest: the oldest dates going back to the 10th millennium bp.

In Africa pottery was invented sometime in the 10th millennium bp. The invention „took place within the zone that is now the southern Sahara and the Sahel, but probably neither west of the Hoggar Mountains nor east of the Nile Valley". On the other hand, pottery was probably developed more than once, under various conditions and in different areas (Close 1995: 23, here also the quotation). This paper deals with the question where pottery might have arisen in this large area of the southern Sahara by taking a closer look at some aspects of the decoration patterns and at the available radiocarbon datings.

Early ceramics and Wavy Line

The emergence of early ceramics in the Sahara has always been closely linked to the presence of Wavy Line (WL) pottery. WL pottery with its two varieties – Incised Wavy Line (IWL) and Dotted Wavy Line (DWL) (Fig. 1) – existed from the very beginning of ceramic production in the 10th millennium bp. Since Anthony Arkell's first research on sites in the Khartoum area (Arkell 1949; 1953), archaeologists have been fascinated by IWL- and DWL-pottery, especially by the wide distribution of the second type of decoration. DWL is

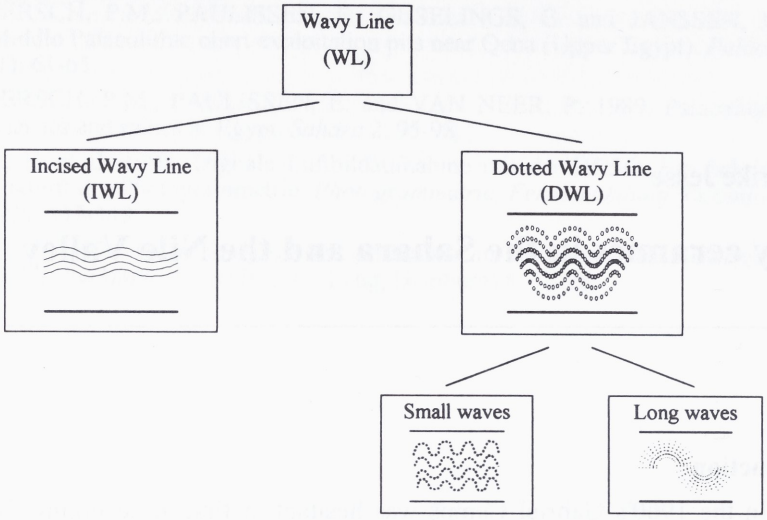

Fig. 1. Wavy Line – a classification

known at sites throughout the Sahara, from the Atlantic to the Red Sea. IWL is more limited in its distribution and is numerous only at sites in central Sudan (Garcea 1993, 1998).

The wide spread of WL pottery has led to very different ideas of how, when and where this pattern was distributed. Both the Khartoum area and the Central Sahara have been proposed as areas of origin (Arkell 1962: 285-286 versus Braunstein-Silvestre 1980) – the state of affairs depending on the available database and especially on the known radiocarbon dates.

Around 380 sites containing either DWL and / or IWL are now known in Northern Africa, and when plotted onto a map they confirm the distribution of WL stretching from the easternmost Sahara to the Atlantic coast (Fig. 2). However, when the radiocarbon dates from this large area are taken into account it becomes apparent that the central and eastern parts of the Sahara are to be seen separately from the western part (Fig. 3). In the Central and the Eastern Sahara (including the Nile Valley) WL patterns prevail from the 10th millennium bp up until the 6th millennium bp, but from the 5th millennium bp onwards WL patterns are only to be found in the western part of the Sahara. The Central and Eastern Sahara, the regions where the oldest WL pottery is encountered, correspond to the area proposed by Angela Close (1995) for the development of early pottery. However, despite the very similar time span (10th to 6th millennium bp) given by the radiocarbon dates for WL pottery in the Eastern and Central Sahara, there are clear differences between the ceramics of the two areas.

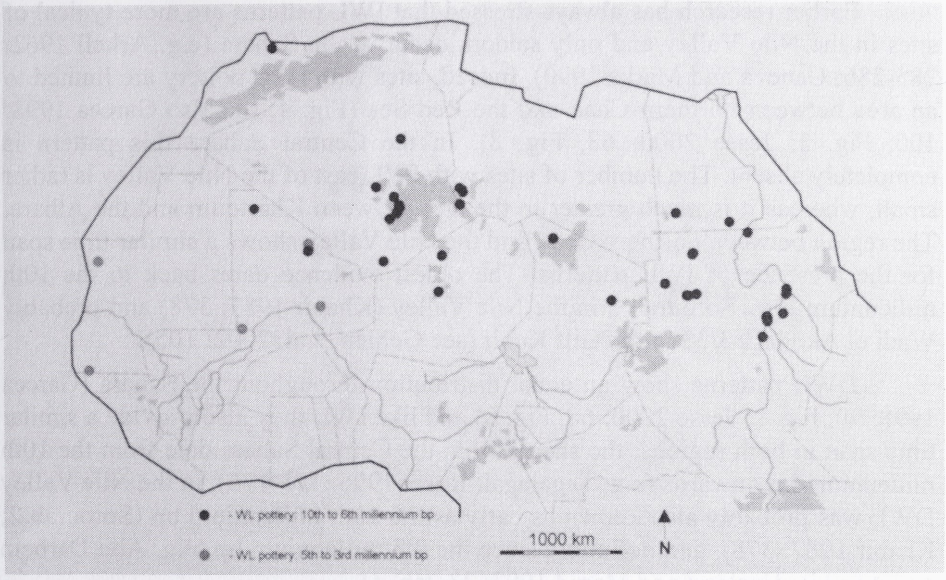

Fig. 2. The distribution of Wavy Line pottery (Dotted and / or Incised Wavy Line) in Northern Africa.

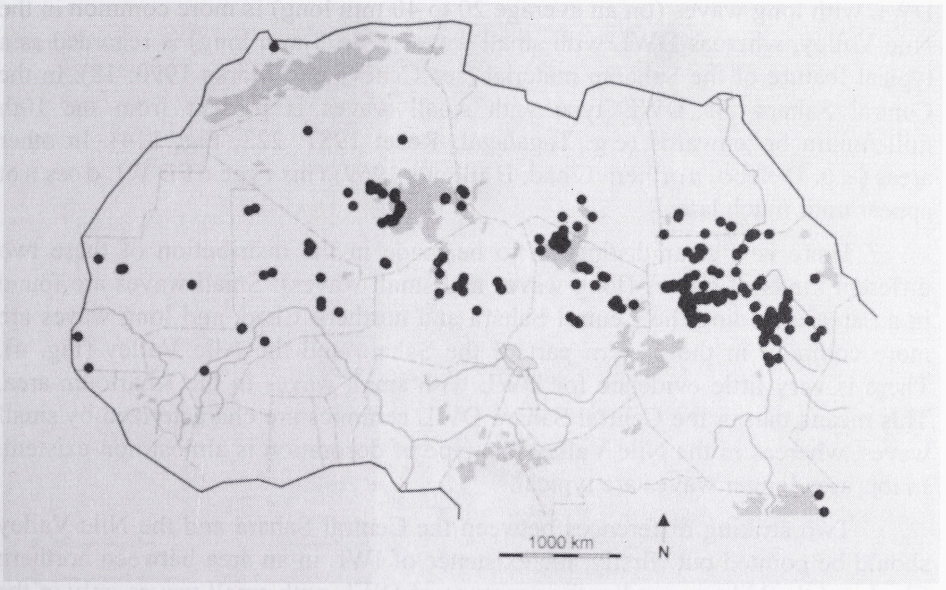

Fig. 3. Radiocarbon datings related to Wavy Line (WL) pottery in Northern Africa.

Earlier research has always stressed that IWL patterns are more typical of sites in the Nile Valley and only seldom occur in the Sahara (e.g. Arkell 1962: 285-286; Caneva and Marks 1990). Indeed, sites with IWL pottery are limited to an area between northern Chad and the Red Sea (Fig. 4; see also Garcea 1998: 100, Fig. 3; Jesse 2000: 68, Fig. 8). In the Central Sahara this pattern is completely absent. The number of sites with IWL east of the Nile Valley is rather small, whereas it is much greater in the area between Khartoum and the Atbara. The region between northern Chad and the Nile Valley shows a similar time span for the presence of IWL patterns. The oldest evidence dates back to the 10th millennium bp – Sorourab 2 in the Nile Valley (Khabir 1987: 378) and probably Wadi el Akhdar 83/33 in the Gilf Kebir (see Gehlen et al. 2002: 105).

DWL patterns show an equal distribution throughout the Sahara (Garcea 1998: 99, Fig. 2; Jesse 2000: 68, Fig. 8) and like IWL they also provide a similar time span in both regions: the sherds from the Central Sahara date from the 10th millennium bp onwards (e.g. Tagalagal; Roset 1996: 175-176), in the Nile Valley DWL was probably also known as early as the 10th millennium bp (Sorourab 2; Khabir 1987: 378), and definitely since the 9th millennium bp (e.g. Abu Darbein and Aneibis; Haaland and Magid 1992: 23, tab. 1).

Regarding the DWL a little closer, different kinds of patterns can be distinguished. Especially the distinction of different types of curves is of particular interest. A characteristic difference is the length of the curves (Fig. 1): DWL with long waves (on an average 20 to 40 mm long) is more common in the Nile Valley, whereas DWL with small waves (7 to 8 mm long) is regarded as a typical feature of the Saharan material (see Caneva and Marks 1990: 18). In the Central Sahara the DWL type with small waves is present from the 10th millennium bp onwards (e.g. Tagalagal; Roset 1987: 222, Fig. 114). In other areas (e.g. Délébo, northern Chad; Bailloud 1969) this type of DWL does not appear until much later.

There is a clear distinction to be made in the distribution of these two different kinds of curves (long waves and small waves): Small waves are found in an area including the Central Sahara and northern Chad, and long waves are more common in the eastern part of the Sahara and the Nile Valley (Fig. 4). There is very little evidence for DWL with small waves in the Khartoum area. This means that in the Central Sahara DWL ceramics are characterized by small waves, whereas in the Nile Valley this type of decoration is almost non-existent. In this area longer waves are typical.

Two striking differences between the Central Sahara and the Nile Valley should be pointed out: firstly, the existence of IWL in an area between northern Chad and the Nile, secondly, the presence of DWL with small waves only in the Central Sahara.

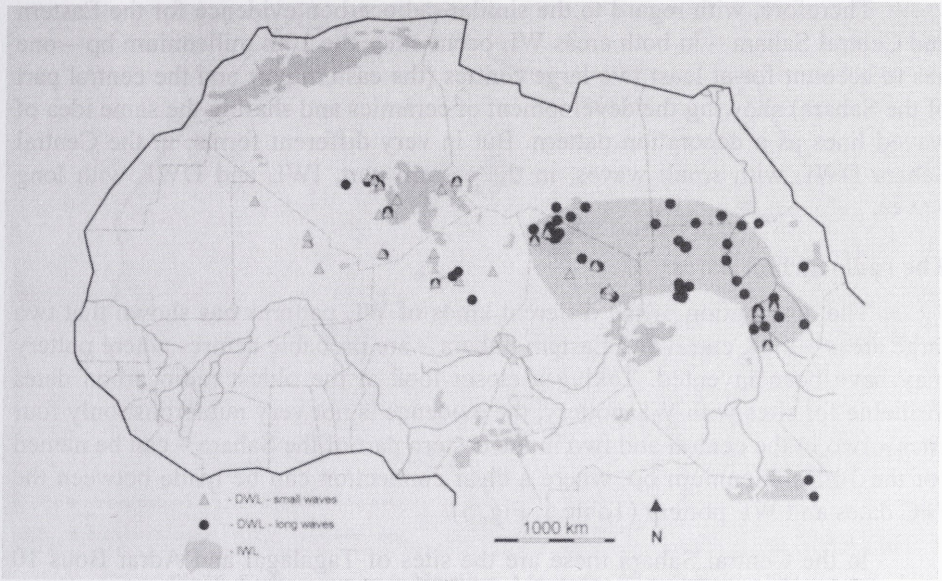

Fig. 4. The distribution of Incised Wavy Line (IWL) and the different forms of Dotted Wavy Line (DWL) in Northern Africa, 10th to 6th millennium bp.

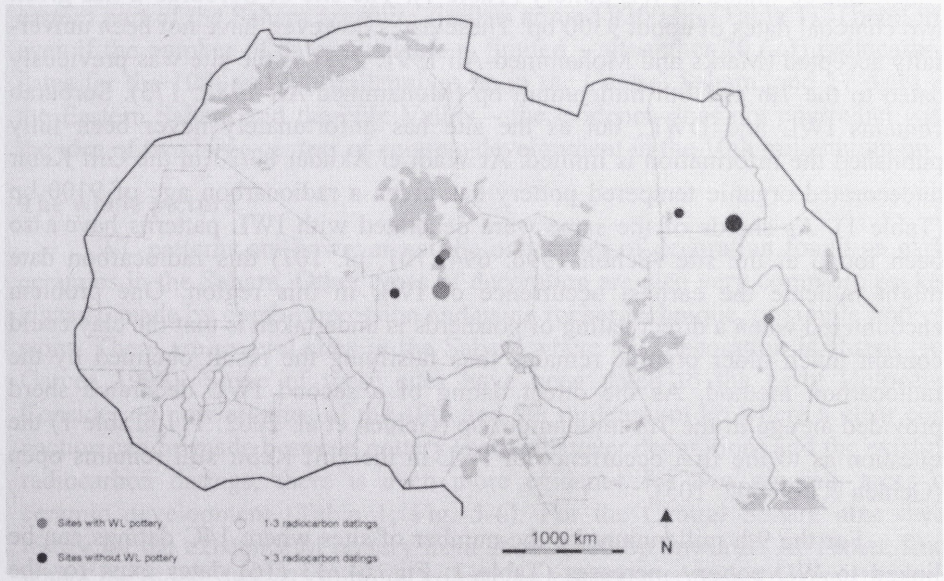

Fig. 5. Early ceramics in Northern Africa: the 10th millennium bp.

Therefore, with regard to the similar radiocarbon evidence for the Eastern and Central Sahara – in both areas WL occur since the 10th millennium bp – one has to account for at least two large centres (the eastern part and the central part of the Sahara) showing the development of ceramics and sharing the same idea of waved lines as a decoration pattern. But in very different forms: in the Central Sahara DWL with small waves, in the eastern part, IWL and DWL with long waves.

The radiocarbon dates

The distribution of the different kinds of WL patterns has shown that two large areas – the Central and Eastern Sahara – are probable centres where pottery may have been invented. Taking a closer look at the oldest radiocarbon dates available for sites with WL pottery, the evidence is not very numerous: only four sites – two in the central and two in the eastern part of the Sahara – can be named for the 10th millennium bp, where a clear connection can be made between the 14C dates and WL pottery (Table 1, Fig. 5).

In the Central Sahara these are the sites of Tagalagal and Adrar Bous 10 (both in Niger); seven radiocarbon dates indicate the existence of WL patterns from about 9400 bp onward (Table 1). The old age of the pottery at both sites has recently been confirmed by TL-dates from several sherds (Roset 1996: 177). In the eastern part of the Sahara only three dates from the 10th millennium bp exist which can be linked to WL pottery (Table 1). The site of Sorourab 2 has given two charcoal dates of about 9300 bp. These dates however, have not been universally accepted (Marks and Mohammed-Ali 1991: 239) as the site was previously dated to the 7th and 6th millennium bp (Mohammed-Ali 1982: 173). Sorourab contains IWL and DWL, but as the site has unfortunately never been fully published the information is limited. At Wadi el Akhdar 83/33 in the Gilf Kebir undecorated organic tempered pottery has given a radiocarbon age of 9100 bp (Table 1). As sherds of the same ware decorated with IWL patterns have also been found at the site (Schön 1996: 694, 701, pl. 107) this radiocarbon date might indicate the earliest occurrence of IWL in this region. One problem encountered when a direct dating of potsherds is undertaken is that the clay could contain much older organic remains thus falsifying the result obtained by the radiocarbon method. As the direct dating of a second IWL decorated sherd provided an age in the 7th millennium bp (Gehlen et al. 2002: 111, Table 1) the question as to the first occurrence of IWL in the Gilf Kebir still remains open (Gehlen et al. 2002: 105).

For the 9th millennium bp the number of sites where 14C datings can be linked to WL pottery increases (Table 1; Fig. 6): 13 (16) dates exist for the Central Sahara pointing to the existence of WL pottery (always DWL) at seven

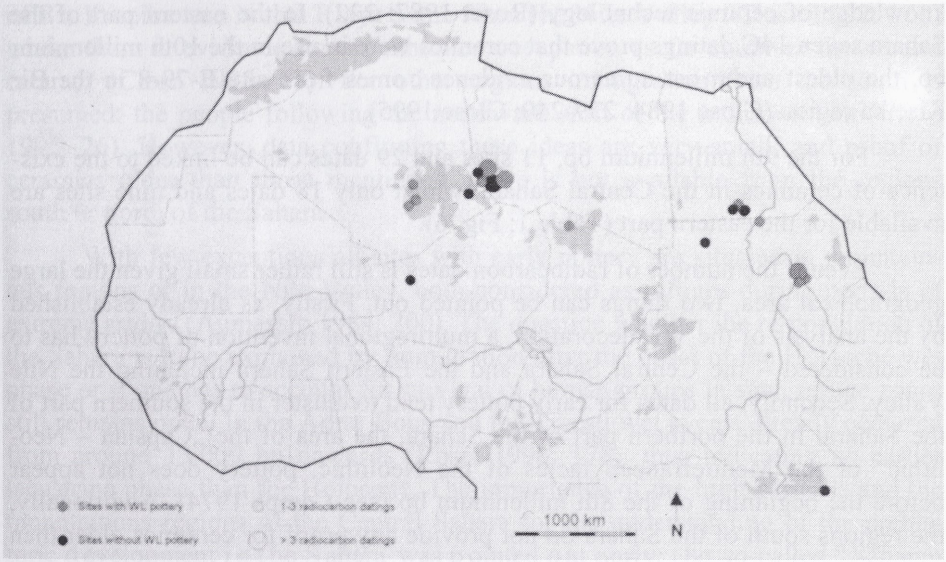

Fig. 6. Early ceramics in Northern Africa: the 9th millennium bp.

sites, whilst 14 radiocarbon dates are available for WL pottery at five sites in the Eastern Sahara and the Nile Valley. The oldest dates for WL in the central and eastern part of the Sahara are quite similar: around 9300 bp (Table 1). Therefore, even if the number of dates available is limited – altogether 20 (23) radiocarbon dates for the 10th and 9th millennium bp in the Central Sahara, and 17 dates in the Eastern Sahara and the Nile Valley – the evidence does not contradict with the idea of two large centres of ceramic development in the 10th millennium bp.

The whole picture

WL patterns are however not the only types of decoration found on early ceramics in the Sahara. Other types of decoration are also very common: packed zigzags, made by comb impression and using rocker technique, or simple impressions. There are several sites in the Sahara where WL decoration is absent (see Garcea 1993). Some of these sites have been dated to the early Holocene. Considering now all sites of the 10th and 9th millennium bp where a clear connection can be made between pottery (with whatever decoration) and the existing radiocarbon datings, there is even more evidence for two separate areas of ceramic development (Table 1; Fig. 5-6). For the Central Sahara nine dates testify for the existence of pottery from about 9500 bp onwards. At Temet, from where the oldest date (9550 bp) is known, no pottery was found during the excavation; however, a potter's comb made of fibrolite found in situ points to the

knowledge of ceramic technology (Roset 1987: 222). In the eastern part of the Sahara seven 14C datings prove that ceramics were in use in the 10th millennium bp, the oldest and most numerous evidence comes from site E-79-8 in the Bir Kiseiba region (Close 1984: 239-240; Close 1995).

For the 9th millennium bp, 11 sites and 29 dates can be linked to the existence of ceramics in the Central Sahara, whilst only 18 dates and nine sites are available for the eastern part (Table 1; Fig. 6).

Even if the number of radiocarbon dates is still rather small given the large geographical area, two things can be pointed out. Firstly, as already established by the analysis of the WL decoration, a multiregional invention of pottery has to be considered – the Central Sahara and the Eastern Sahara including the Nile Valley. Secondly, all dates for early pottery tend to cluster in the southern part of the Sahara. In the northern part of the Sahara, the area of the „Capsian – Neolithic" or the Mediterranean facies of the Neolithic, pottery does not appear before the beginning of the 8th millennium bp (see Camps 1974). Additionally, the regions south of the Sahara do not provide any proof for ceramics older than in the Central and Eastern Sahara.

Only in Kenya there is some evidence for old pottery: at site Zu-4 in Lothagam decorated pottery appears in a context datable to about 8400 bp (Robbins 1974: 366). At Lowasera a DWL sherd was found in a locality attributable to an age of about 8000 bp (Phillipson 1977: 48). However, the evidence for early ceramics in this region is modest and about 1000 years younger than the earliest occurrence of pottery in the Saharan region.

Concluding remarks

The available evidence points to an invention of pottery in the southern part of the Sahara. As shown through the decoration, especially WL patterns, there were most probably two areas of ceramic development: the Central Sahara on the one hand and the Eastern Sahara including the Nile Valley on the other hand.

Interestingly, the above mentioned ceramic sites in the Sahara represent some of the oldest evidence for the re-occupation of this region after the long post-Aterian arid phase. The question where pottery was invented can be closely linked to a further problem: the question of how the Sahara was re-populated at the onset of a more favourable climate at the beginning of the Holocene.

This question however still awaits a detailed answer. In his overview of the „Neolithisation" of Northern Africa, Alfred Muzzolini simply states that the people probably came from the periphery still inhabited during the arid phase in the Sahara (Muzzolini 1989: 152). It is supposed that the first settlers of the area

of Bir Kiseiba and Nabta Playa came from the Nile Valley (Close 1992: 160) where there is evidence for an unbroken occupation as far south as the second cataract (Close 1995: 25). For other regions immigration from the south is presumed: the people following the northward shift of the monsoon belt (Close 1995: 26). However, data confirming these ideas are very small, and proof of ceramics older than those mentioned above is not available from the regions south or north of the Sahara.

With few exceptions all sites with early pottery are situated in mountainous regions or in the Nile Valley, both considered as refuges during periods of extreme aridity (Aumassip 1984: 200). The question whether the re-population of the Sahara is to be explained by immigration after the onset of the Holocene wet phase or if one has to account for survival of human groups in such refuge zones still remains open. In the Adrar Bous and the Tibesti wet events already occurred from around 13.000 bp onwards (Roset 1996: 178), thus indicating an earlier lacustrine phase than the Holocene. The importance of the high plateaus and the mountainous regions of the Central Sahara for the understanding of the prehistoric development in the Sahara was pointed out early: the so-called "Saharan Fertile Crescent" situated between Darfur and the Gilf Kebir in the east and the Hoggar Mountains in the west "has functioned through time as a zone characterized by migration of plants, animals, and man during times of climatic fluctuation". The higher mountain ranges would have served as refuges for savannah biota during drier periods (Hester 1968: 498, here also the quotation).

The possibility of survival of human groups in different refuge zones would fit in well with the idea of a multiregional development of ceramic technology in the Sahara. With the current database however, such a scenario has to remain pure speculation finally as well as the one proposing immigration from the south. Therefore, more research concerning the question of how the Sahara was re-populated after the post-Aterian arid times might shed also new and more light on the question of early ceramics in the Sahara.

Table 1: Sites in the Sahara and the Nile Valley with early ceramics and radiocarbon dates connected to the pottery:

site	C14 bp	C14 BC *	Lab-Nr.	material	pottery	reference
Adrar Bous 10 (Niger)	9130± 65	8363± 79	UW-806	C	DWL	Roset 1996: 176
	9100±150	8284±224	Paris	C	DWL	
	9030±190	8177±276	UW-754	C	DWL	
Tagalagal (Niger)	9370±130	8691±234	Paris	C	DWL	Roset 1996: 175-176
	9330±130	8596±194	Paris	C	DWL	
	9150± 90	8394±104	Paris	C	DWL	
	9000±120	8133±166	CNRS	C	DWL	
Tamaya Mellet (Niger)	9350±170	8689±285	Gif-1728	bone	x	Paris et al. 1993: 385
	8320±300	7293±392	Pa-236		x	
Temet (Niger)	9550±100	8938±174	Paris	C	potter's comb	Roset 1987: 221
Bir Kiseiba E-79-8 (Egypt)	9820±380	9401±615	SMU-858	C	x	Close (ed.) 1984: 239-240
	9440±230	8776±320	SMU-758	C	x	
	9180±140	8430±158	SMU-914	C	x	
	9060± 80	8255±130	SMU-861	C	x	
Wadi el Akhdar 83/33 (Egypt)	9080± 50	8310± 61	UtC-6536	Cer	x (IWL ?)	Gehlen et al. 2002: 111
Sorourab 2 (Sudan)	9370±110	8655±181	HAR-3475	C	IWL/DWL	Khabir 1987: 378
	9330±110	8575±163	HAR-3476	C	IWL/DWL	
Amekni (Algeria)	8050± 80	7006±175	UW-87	C	DWL	Camps 1969: 206
Site Launey (Algeria)	8475±100	7492± 96	UW-96	C	DWL	Camps et al. 1973: 86

site	C14 bp	C14 BC *	Lab-Nr.	material	pottery	reference
Timidouin, TF-TD 155-32 (Algeria)	8100±130	7064±226	Mc-484	C	DWL	Camps et al. 1973: 86
Ti-n-Hanakaten (Algeria)	8100±130	7064±226	Mc-678		x	Aumassip and Délibrias 1982-1983: 209
	8030±120	6976±212	Gif-948		x	
Fozzigiaren (Libya)	8072±100	7041±206	Pisa	C	DWL	Barich et al. 1984: 413
Ti-n-Torha East (Libya)	8640± 70	7696± 88	R-1035α	C	DWL	Barich (ed.) 1987: 328
	8540±140	7624±173	R-1160α	C	DWL	
	8460± 60	7514± 53	R-1033α	C	DWL	
	8460± 50	7523± 45	R-1161α	C	DWL	
Ti-n-Torha Two Caves (Libya)	8840± 60	7990±152	R-1405	C	x	Barich (ed.) 1987: 328
	8520± 60	7556± 36	R-1407	C	x	
Uan Afuda (Libya)	8935±100	8063±151	GX-20754	C	x (DWL ?)	Di Lernia (ed.) 1999: 21
	8790± 95	7914±191	GX-20751	C	x (DWL ?)	
	8765±105	7886±195	GX-20010	C	DWL	
	8555±110	7630±119	GX-20753		DWL	
	8330±100	7350±142	GX-20346		DWL	
	8000±100	6922±170	GX-18104	dung	x (DWL ?)	
Uan Tabu (Libya)	8880±100	8004±171	Rome-293	C	x	Garcea 1999: 161
	8850±100	7973±181	Rome-296	C	x	
	8840± 90	7969±177	Bo-195	C	x	
	8800±100	7925±193	Rome-292	C	x	
	8720±110	7832±176	Bo-191	C	x	
	8690± 50	7720± 88	Bo-193	C	x	

site	C14 bp	C14 BC *	Lab-Nr.	material	pottery	reference
	8640± 70	7696± 88	Bo-192	C	x	
	8600± 90	7676±103	Rome-297	C	x	
Gabrong (Chad)	8560±120	7648±140	Hv-3715	?	DWL	Schuck 1989: 183
	8065±100	6032±206	Hv-2748	C	DWL	Gabriel 1981: 197
Bir Kiseiba E-79-2 (Egypt)	8130±110	7112±194	SMU-760	C	x	Close (ed.) 1984: 120
Bir Kiseiba E-79-4 (Egypt)	8190±120	7226±167	SMU-750	C	x	Close (ed.) 1984: 159
Bir Kiseiba E-80-1 (Egypt)	8020± 90	6952±171	SMU-926	C	DWL	Close (ed.) 1984: 296
	8020± 70	6947±141	SMU-915	C	DWL	
Nabta Playa E-77-7 (Egypt)	8875± 75	8019±148	ETH-8583		x	Nelson 2002: 21
Abka, Site IX (Sudan)	8260±400	7250±502	M-804	shell	WL	Myers 1960: 181
Abu Darbein (Sudan)	8640±120	7756±157	T-8624	moll	IWL/DWL	Haaland and Magid (eds.) 1995: 49
	8560± 35	7580± 25	Q-3230	moll	IWL/DWL	
	8500±100	7531± 94	T-6381	moll	IWL/DWL	
	8435± 95	7463± 96	Q-3229	moll	IWL/DWL	
	8390± 70	7444± 84	T-8525	moll	IWL/DWL	
	8330±100	7350±142	T-8626	moll	IWL/DWL	
Aneibis (Sudan)	8230±120	7265±163	T-8643	moll	IWL/DWL	Haaland & Magid 1992: 23
	8090± 60	7104±159	T-8648	moll	IWL/DWL	

site	C14 bp	C14 BC *	Lab-Nr.	material	pottery	reference
El Damer (Sudan)	8390± 50	7451± 72	T-7485	moll	IWL/DWL	Haaland and Magid 1992: 23
	8040±120	6993±219	T-9698	moll	IWL/DWL	
	8010±120	6947±203	T-8640	moll	IWL/DWL	
Wadi Shaw 83/108 (Sudan)	8470± 50	7530± 42	UtC-6535	Cer	x	Jesse 1998: 265
Lothagam, Zu-4 (Kenya)	8420±165	7417±194	N-1100		x	Robbins 1974: 366

C – charcoal; Cer – ceramic; moll – mollusc shell.

* The calibrated dates are calculated using CALPAL 2001 (Cologne Radiocarbon Calibration and Palaeoclimatic Research Package) by Dr. B. Weninger, Radiocarbon Laboratory, University of Cologne.

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