Report to the SCA on archaeological survey undertaken at Medinet el-Gurob, 1-22 April 2009

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Abstract: This article presents a preliminary (three-month) report on the 2009 season of survey undertaken by the University of Liverpool at the site of Medinet el-Gurob in the Faiyum region. The principal tasks accomplished were mapping, surface collection and analysis of pottery, field-walking for small finds, as well as auger boring and ground probing radar survey in order to gain a better understanding of the subsurface remains. The project also cleaned (1) areas previously excavated by Brunton and Engelbach in the 1920s, revealing traces of at least one kiln possibly used for working glass during the New Kingdom, and (2) a surviving area of kom in the agricultural area immediately adjacent to the site.

Introduction

The Gurob Project is a preliminary study of the urban and funerary remains at the 'harim town' of Mi-wer (Gurob) in the Faiyum region. The principal aims of the project are (1) to produce an accurate 1:1000 map of the site as a whole, combining GIS so as to allow our growing databases of ceramics, small finds and lithics to be mapped onto the visible surface features (2) to create more detailed plans of the main points of archaeological interest in the settlement and cemeteries, (3) to produce a basic modern corpus of pottery at the site, (4) to use satellite photographs, geophysical methods, core-drilling and surface examination to gain a better understanding of the original architecture and ancient activities, as well as the relationship between the site of Gurob and its landscape and environment. The vast majority of the ceramic material covering the surface of the site dates to the mid- to late New Kingdom, affording considerable potential to analyse chronological and functional patterns across the site through the study of such material. These approaches have therefore been adopted as key elements in the strategy for exploration and analysis of the site since the 2006 season.[1]

The nature of the site and the strategy of the 2009 work

As in the four previous seasons, our principal aims in the 2009 season of survey at Gurob were not only to seek confirmation of the overall layout and chronology of the settlement area of the site but also to understand the nature of Gurob as a whole, including the study

[1] Preliminary reports on the 2005, 2006 and 2007 seasons have been published in Shaw 2007, 2008 and 2009. Key previous publications are Petrie 1890, 1891, Loat 1905, Borchardt 1911, Brunton and Engelbach 1927, Kemp 1978, Thomas 1981, Lacovara 1997.

of the extensive cemeteries.[2] We are also aiming to gain a better understanding of the duration and nature of settlement at the site, and its relationship with the surrounding funerary remains and landscape. The six basic strands of work at the site in 2009, described below, were therefore topographical and architectural survey, pottery surface collection, small finds collection, auger boring, ground penetrating radar survey, and re-examination of previously excavated features.

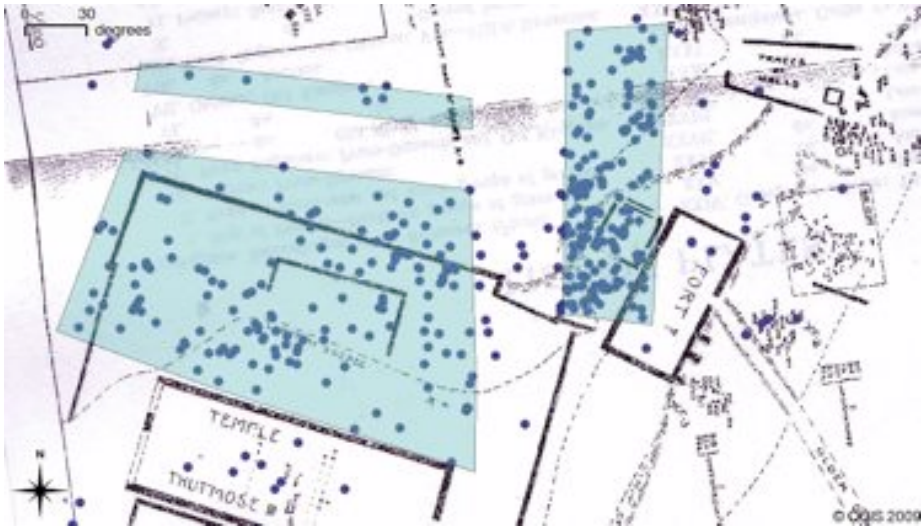

Figure 1: The 2009 fieldwalking transects superimposed on the 1927 (Brunton and Engelbach) map of the site, showing the recorded locations of small finds.

Topographical and architectural survey

The mapping of the topography and surface features of the site began in the 2006 season with the creation of an alphanumeric grid across the site, comprising over 150 wooden pegs and 9 iron pegs set at 20-metre intervals along grid-lines oriented east-west (numbering from '1' upwards) and north-south (labelled from the 'A' upwards through the alphabet). This grid system has now been expanded so that the 2006 alphanumeric sequence of grid-points comprises one single major 500 x 500m gridsquare (no.13) within a sequence of twelve covering the entire site.

[2] The 2009 team consisted of fifteen members: Dr Ian Shaw (University of Liverpool, UK), Claire Malleson (University of Liverpool), Jan Picton (University College London), Ivor Pridden (University College London), Hannah Pethen (Museum of London Archaeology), Nadia Mahmoud (University College London), Tina Jakielski (University of Bath), Virpi Perunka (University of Helsinki), Daniel Boatright (University of Liverpool), Marine Yoyotte (Sorbonne, Paris), Anna Hodgkinson (University of Liverpool), Eleanor Hughes (University of Cambridge), Kristian Strutt (University of Southampton), Omar Faroukh, and Ashraf el-Senussi (Curator of the Kom Aushim Museum, SCA). I would like to thank Dr Zahi Hawass, Dr Ahmed Abd-el Aal (the director of the Faiyum branch of the SCA), Dr Magdi el-Ghandour in the SCA Documentation Centre, Cairo, and our inspector Sayed Mohamed Abdel Samed for their generous assistance and advice in our work at Gurob in 2009.

Within the same map, the locations of small finds (mainly stone artefacts and fragments of faience and travertine jewellery and vessels) have also been recorded (see Fig.1), alongside the positions of pottery surface collection squares and four small planned areas (see section on small finds below). Since 2007 we have also begun to map as many as possible of the visible features on the site surface, from mud-brick features in the settlement area to shaft-tombs in the cemeteries.

The survey was conducted using a Leica TCR705 Total Station. The machine was downloaded on a daily basis using Leice Geooffice tools. Small finds were recorded in three dimensions, during and outside fieldwalking and checked against the current database. The GIS software used is QuantumGIS, an open-source program with a GRASS plugin.

The site grid was re-established where necessary and some pottery squares were staked out. The tomb survey of the Old Kingdom/First Intermediate Period cemetery, commenced in previous years, was continued and *c.*100 further tombs were mapped (see Fig.2).

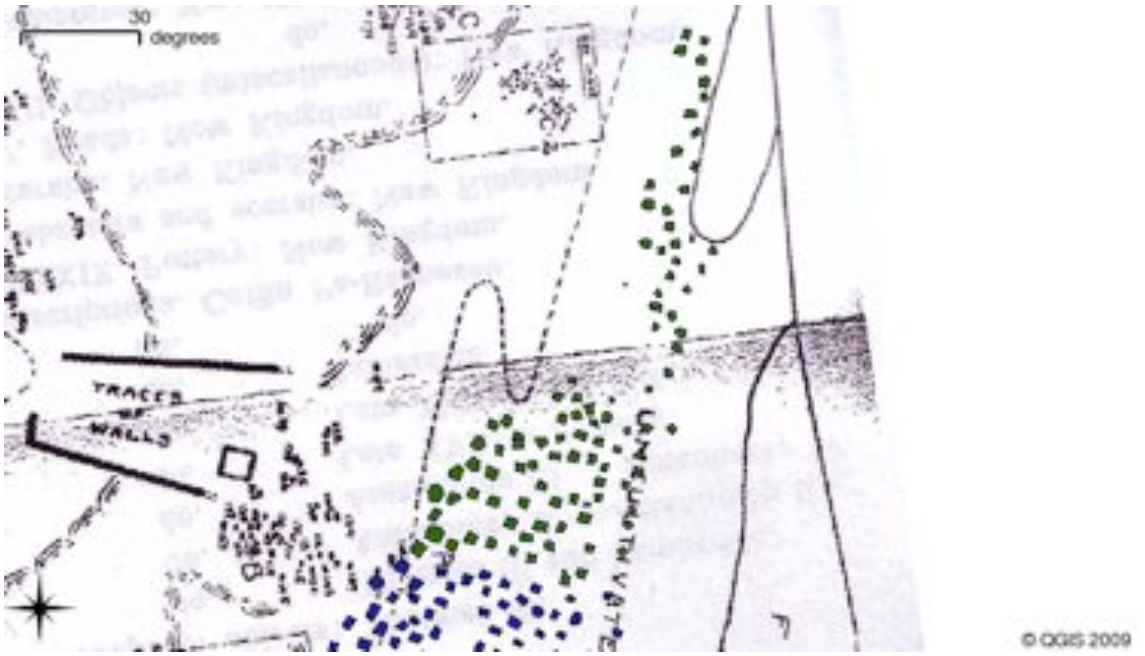

Figure 2: The tombs mapped at the eastern edge of the site during the 2009 season.

The pottery (Virpi Perunka and Ashraf el-Senussi)

During the 2009 season at Gurob we continued the systematic pottery surface survey begun in the 2006 season, collecting over 28,000 potsherds from a number of locations throughout the site (total weight *c.*195kg, including nearly 1100 diagnostics, the overall ratio of Nile silt to marl fabric being around 60:40).

In total, we collected pottery from eight 10x10m squares, each selected from within the grid of 20x20m squares laid out as a preliminary to the topographic and geophysical surveys (D18a, H17c, K10d, K18b, L15a, M14c, N8d, Q7a). These squares were chosen systematically in order to obtain a number of samples from a diverse range of functional areas within the site, e.g. square D18a from the area occupied by the presumed southern palace building, and M14c from the area to the north of the main settlement enclosure (see Fig. ?? below for the locations of the squares listed above). The rationale behind this strategy is to test the hypothesis that even after extensive excavations in the late 19th and early 20th centuries, together with subsequent severe disturbance during the late 20th-century military use of the site, it should still be possible to utilise the basic spatial patterning of different pottery types and fabrics to reconstruct certain aspects of human activities at the site during the pharaonic period. Appendix 1 presents the raw data from each of the pottery collection squares. Pottery recovered from different areas of Gurob during the 2009 season was 95% New Kingdom in date.

1. Pottery from the surface collection

The following presents the results of the surface ceramics collection around the archaeological site of Gurob. The tables and charts below only present diagnostic sherds recorded and counted. All pottery recorded here was found on the surface, therefore no complete pots are present, and the sherds survive in fairly good condition, considering that both wind and rain have weathered them. Nevertheless, the surface treatment of pottery is occasionally difficult to describe due to the erosion. The ceramicists working at Gurob use the Vienna System as their fabric reference, until a site-specific fabric system has been fully established. Marl D and Nile B2 are the two most common fabrics.

All of the 2009 pottery (except for a few Old Kingdom/First Intermediate Period sherds), dates to the New Kingdom, from mid-18th to 19th Dynasty. It has been noted by other ceramicists (e.g. Aston 1998 and Budka 2007) that distinguishing late 18th–early 19th-Dynasty pottery is very difficult, since there appears to be great continuity in the pottery styles of the period. New Kingdom pottery is conventionally divided into four phases, the third of which is late 18th–19th-dynasty pottery (see Bourriau 1981).

Amphorae are one of the most common types of pottery vessel at the site. This is hardly surprising as the site was a settlement and a royal establishment, where commodities like wine would be consumed as a part of the diet, therefore one would expect to find vessels which could have contained it. The elements which survive of amphorae are handles and rims. The amphorae are both Egyptian and Canaanite. These vessels are made of Marl D, if Egyptian and of two different Canaanite fabrics; one in which fine chalk, limestone and quartz dominate the fabric and another one which is easily recognisable because its fracture and surfaces are dominated by black “spots”(riverine basalt).

Cups and bowls, as part of a selection of table ware, also belong to the most common vessel types at Gurob, which would be expected at any settlement of any given period in Egypt. Most of the table ware is made of fabric Nile B2, which is the most common fabric type in Egyptian pottery throughout the pharaonic history and especially common in small vessels, such as table ware. Meat jars are a well-established New Kingdom type

and frequently found at Gurob. The jar's rim is easily recognizable due to its hardness (which is due to the fabric, usually Marl D and high firing conditions), as well as the rim's shape.

Blue painted pottery sherds appear occasionally, and tend to be of medium thick-walled vessels such as bowls or bottles/flasks. The sherds rarely give an indication of a bigger picture, in terms of decorative features, but would appear to follow the common floral themes or geometrical patterns. There also is an interesting sherd bearing a clearly inscribed *ankh* sign (sherd 337). The blue painted potsherds found at Gurob are either made of Nile B2 or Nile D fabrics.

SQUARE/GRID: H 17 C

	RIMS	*BASES*	*HANDLES*	*DECORATED*	*TOTAL*
MARL FABRICS	*106*	*34*	*11*	*1*	*152*
NILE FABRICS	*94*	*19*		*4*	*117*

SQUARE/GRID: K 18 B

	RIMS	*BASES*	*HANDLES*	*DECORATED*	*TOTAL*
MARL FABRICS	*25*	*11*	*5*	*3*	*44*
NILE FABRICS	*55*	*4*		*4*	*63*

SQUARE/GRID: L 15 A

	RIMS	*BASES*	*HANDLES*	*DECORATED*	*TOTAL*
MARL FABRICS	*6*		*1*		*7*
NILE FABRICS	*10*				*10*

SQUARE/GRID: M 14 C

	RIMS	*BASES*	*HANDLES*	*DECORATED*	*TOTAL*
MARL FABRICS	*6*	*1*	*2*		*9*
NILE FABRICS	*8*				*8*

SQUARE/GRID: N 8 D

	RIMS	*BASES*	*HANDLES*	*DECORATED*	*TOTAL*
MARL	*99*	*9*	*8*	*1*	*117*

FABRICS					
NILE FABRICS	*325*	*43*		*1*	*369*

SQUARE/GRID: Q 7 A

	RIMS	*BASES*	*HANDLES*	*DECORATED*	*TOTAL*
MARL FABRICS	*74*	*25*	*7*		*106*
NILE FABRICS	*18*	*2*		*2*	*22*

SQUARE/GRID: K 10 D

	RIMS	*BASES*	*HANDLES*	*DECORATED*	*TOTAL*
MARL FABRICS	*23*	*1*	*3*		*27*
NILE FABRICS	*35*				*35*

SQUARE/GRID: D 18 A

	RIMS	*BASES*	*HANDLES*	*DECORATED*	*TOTAL*
MARL FABRICS	*21*	*2*	*7*		*30*
NILE FABRICS	*37*	*1*			*38*

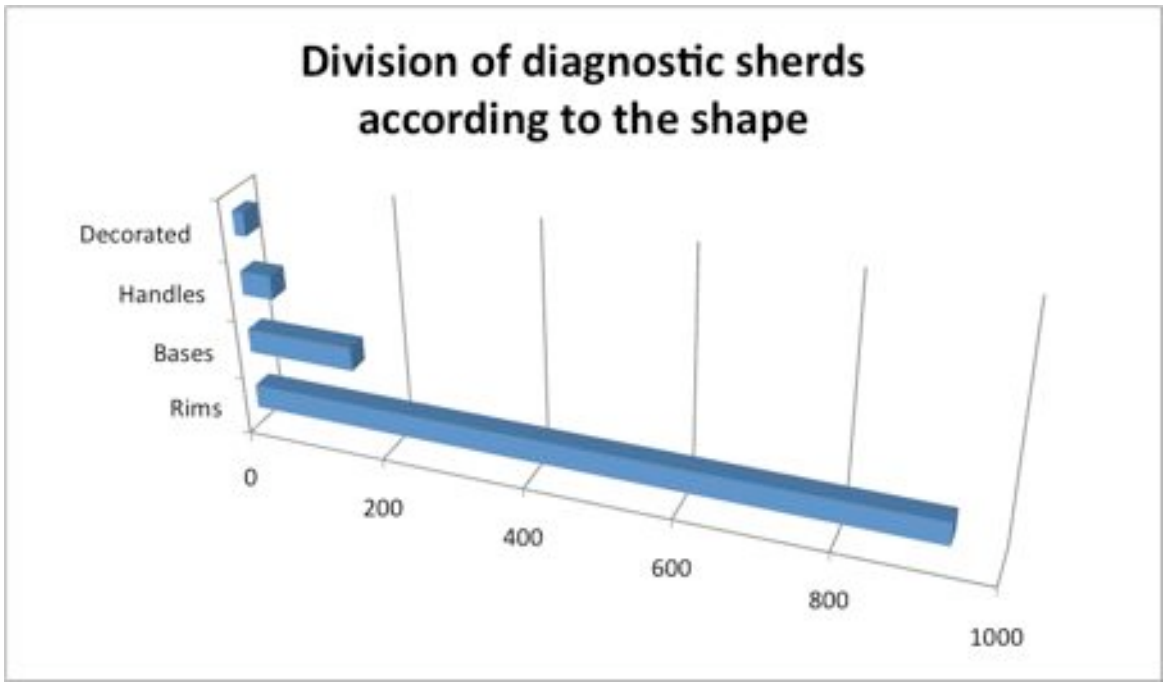

Figure 3: Barchart showing proportions of diagnostic sherds according to type. The total number of all diagnostic sherds collected in 2009 was 1151.

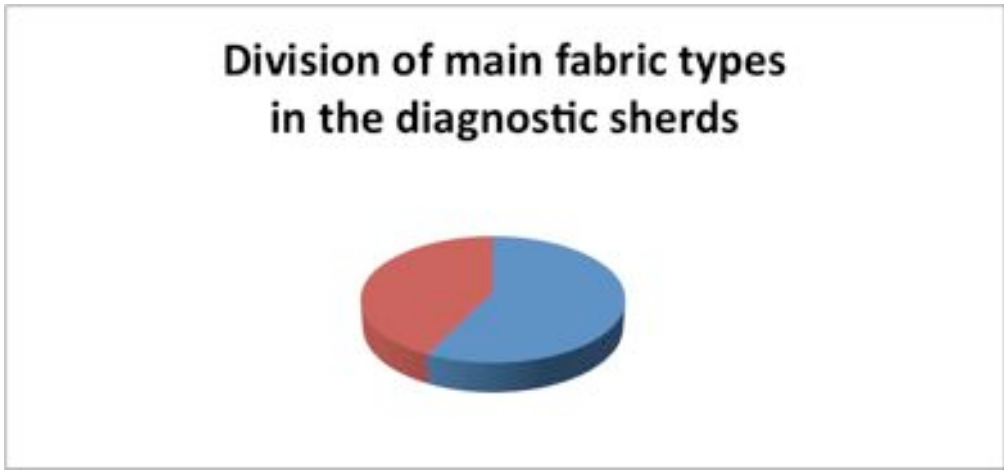

Figure 4: Piechart showing proportions of marl and Nile silt fabrics among the diagnostic sherds. The total number of Nile sherds is 662 and the number of Marl sherds is 492.

2. A Catalogue of selected pottery from Gurob season 2009

Area	K 18 B
Sherd number	91

Description	Storage jar, neckless, rim sherd
Fabric	Marl D
Parallel	Qantir, Aston 1998: 351: 1225, 1227, 1228
Dating	19th Dynasty

Area	K 18 B
Sherd number	149
Description	Bowl, rim sherd
Fabric	Nile B2
Parallel	Deir el-Medina, Nagel 1938: 67: 7; Qantir, Aston 1998: 119: 147
Dating	late 18th to early 19th Dynasty

Area	K 18 B
Sherd number	190
Description	Bowl, rim sherd
Fabric	Nile D
Parallel	Qantir, Aston 1998: 147: 325
Dating	19th Dynasty

Area	K 18 B
Sherd number	191
Description	Large bowl, rim sherd
Fabric	Nile B2
Parallel	Qantir, Aston 1998: 119: 149
Dating	19th Dynasty

Area	L 15 A
Sherd number	216
Description	Jar, neckless storage vessel, rim sherd, traces of pinkish slip
Fabric	Marl A2
Parallel	Qantir, Aston 1998: 311: 102, 106
Dating	19 Dynasty

Area	L 15 A
Sherd number	217
Description	Jar, short neck and ovoid body, rim sherd, pink slip
Fabric	Marl A4
Parallel	Qantir
Dating	18th-19th Dynasty

Area	L 15 A
Sherd number	218
Description	Large open vessel (diameter 27cm), either a bowl or a basin, rim sherd, similar looking open vessels have frequently cord impressions on exterior (related to production method)
Fabric	Nile B2
Parallel	No exact parallel found
Dating	New Kingdom

Area	H 17 C
Sherd number	6
Description	Amphora, rim sherd, white slip
Fabric	Marl D
Parallel	Qantir, Aston 1998: 460: 1665, 1667, 1671, 1681, 1682
Dating	19th Dynasty

Area	H 17 C
Sherd number	8
Description	Amphora, rim sherd
Fabric	Marl D
Parallel	Qantir, Aston 1998: 460: 1670
Dating	19th Dynasty

Area	H 17 C
Sherd number	9
Description	Canaanite amphora handle, sherd, white slip
Fabric	Canaanite, with black basalt inclusions
Dating	18th–19th Dynasty

Area	H 17 C
Sherd number	19
Description	Jar, rim sherd, thick white slip, diameter 20cm (int.). Not well established New Kingdom type, but a frequent find in the tomb of Maya in Saqqara, appears also in earlier Gurob publications (discussion in Aston 1998: 120).
Fabric	Marl D, dense and hard (well fired)
Parallel	Qantir, Aston 1998: 121: 160-162 and same volume no. 1538. Gurob, Brunton and Engelbach 1927: Pl. xxxviii.67E.
Dating	Late 18th to early 19th Dynasty

Area	H 17 C
Sherd number	23 and 26, possibly the same vessel

Description	Ring base, base sherd, painted vessel, probably stir-up jar
Fabric	Fine Mycenaean fabric, very hard due to fine paste and high firing temperature
Parallel	Gurob, Petrie 1890: pl.XXVIII: 1
Dating	19th Dynasty

Area	H 17 C
Sherd number	57
Description	Fragment of a handle, miniature amphora, pilgrim flask
Fabric	Marl D
Dating	18th-19th Dynasty

Area	H 17 C
Sherd number	58
Description	Amphora, rim sherd, imitation of Canaanite amphorae
Fabric	Marl D
Parallel	South Abydos, Budka 2007: 97: fig. 9.10
Dating	Mid-18th – 19th Dynasty

Area	H 17 C
Sherd number	62
Description	Beer jar, rim sherd, direct rim. This beer jar type seems to belong to a Ramesside tradition of beer jar manufacturing. In the traditional Holthoer typology it falls in to type BB4 (Holthoer 1977). Recent work in Qantir and South Abydos suggest an early Ramesside date for this type. This Gurob vessel has a diameter of 16 cm, so it is slightly larger than the majority of the type, but there are known examples of this larger diameter type one, e.g. at Qantir (see Aston 1998 below).
Fabric	Nile D, well fired
Parallel	Qantir, Aston 1998: 283: 196, South Abydos, Budka 2007: 101: fig. 11.1
Dating	Early Ramesside, 19th Dynasty

Area	M 14 C
Sherd number	263
Description	Storage jar “Zir”, rim sherd
Fabric	Nile D, applied white/pinkish slip
Parallel	South Abydos, Budka 2007: 94: fig. 6.3, 6.5
Dating	Mid to late 18th Dynasty

Area	M 14 C
Sherd number	268
Description	Funnel-necked jar, rim sherd, with "a pinched" lip. It is impossible to say whether this feature is accidental or intentional, however, none of the parallele types don't have this particularity.
Fabric	Nile B2 to Nile D
Parallel	Qantir, Aston 1998: 565-72
Dating	19th Dynasty

3. Pottery from the kiln areas 1 and 3
Kiln area 1 produced, in the cleaning process, a total of 23 diagnostic sherds, of which 19 were rims and 3 were bases, in addition to 1 decorated sherd and 1 handle. The handle was part of a New Kingdom amphora made of Marl D fabric, the favoured New Kingdom amphora fabric. Among the diagnostic sherds were in addition a New Kingdom bread-mould rim and two amphora rims.

The diagnostic pottery found in the clearing of kiln area 3 included 6 rim sherds, 4 base sherds and 2 handles. The three stands found were all made of Marl D, which is a good chronological indicator of New Kingdom activity. Additionally, there were two "meat-jars" and an amphora base made of the same fabric, thus providing more material from the same time period. The preliminary analysis suggests that the pottery dates either to the mid or late 18th or 19th dynasty.

4. Pottery from the auger boring cores
The quantity of pottery from the auger cores was greater than anticipated. Of all 6 augers, 4 produced a considerable amount of pottery. In general the most frequently occurring pottery fabrics in the cores were Nile B2 and Marl D. As an indication of the overall position, the material from auger AS09 will be discussed in detail. The total number of pottery sherds from auger AS09 is 164. The two most commonly appearing fabrics in the augers (and in the site in general) are Nile B2 (58 sherds) and Marl D (52 sherds). AS09 did not include any diagnostic sherds, but an interesting addition to the Egyptian pottery was an example of a Canaanite amphora fabric. The result of pottery analysis from the auger suggests heavy New Kingdom occupation at the site – very few sherds of late Old Kingdom pottery were collected from the augers. These Old Kingdom sherds probably derived from the Old Kingdom / First Intermediate Period tombs which are located to the north and north-east of the New Kingdom settlement.

Small finds collection (Jan Picton)

As in the 2005-2008 seasons, small finds were collected, and their provenances recorded in three dimensions using the total station. Nine field walks were conducted during the season and finds were also recorded during surveying and pottery sampling (see Figs 1, 3 & 4). Two small finds were also recorded from the auger cores. The total number of finds for the season was 462.

As before, the majority of finds were small broken pieces of faience, especially ring shanks and sherds of vessels – usually bowls.
Among the more unusual finds this season were:

- a faience scaraboid of a duck with head reversed with two copper pins inserted into the back. The face of the scaraboid is inscribed with a *s*ꜣ sign
- a fragment of a complex piece of blue glass with feathered design in yellow black and white. Dating to the late Eighteenth Dynasty.
- An intact *wḏꜣt* eye in reddish-brown faience with very clearly delineated features
- A small tile decorated with a fish in cream and brown glaze similar to those found at Amarna
- Fragments of two calcite cosmetic spoons, one with the fin of a fish at one edge
- Ten calcite earrings, one intact

For the first time we recovered several pieces of what Petrie called 'rude Mycenaean figurines' with three legs and other roughly described features made from coarse Nile silt clay. Two 'lady on a bed' figurines were found but neither is intact. Again for the first time we found two fragments of shabtis, one in faience and one of Nile silt clay.

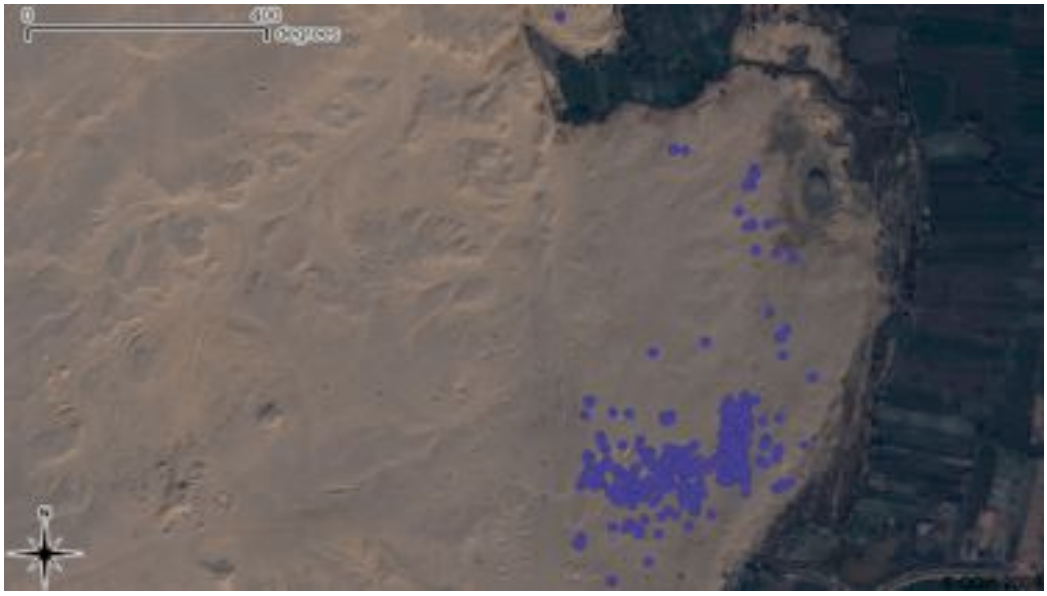

Figure 5: general satellite image of the site of Gurob, showing patterning of the 2009 small finds.

Among the stone fragments collected were granite, quartzite, basalt and granodiorite – none of which appear naturally at the site and indicate architectural or sculptural features that no longer survive. Also recovered was one small fragment of inscribed limestone.

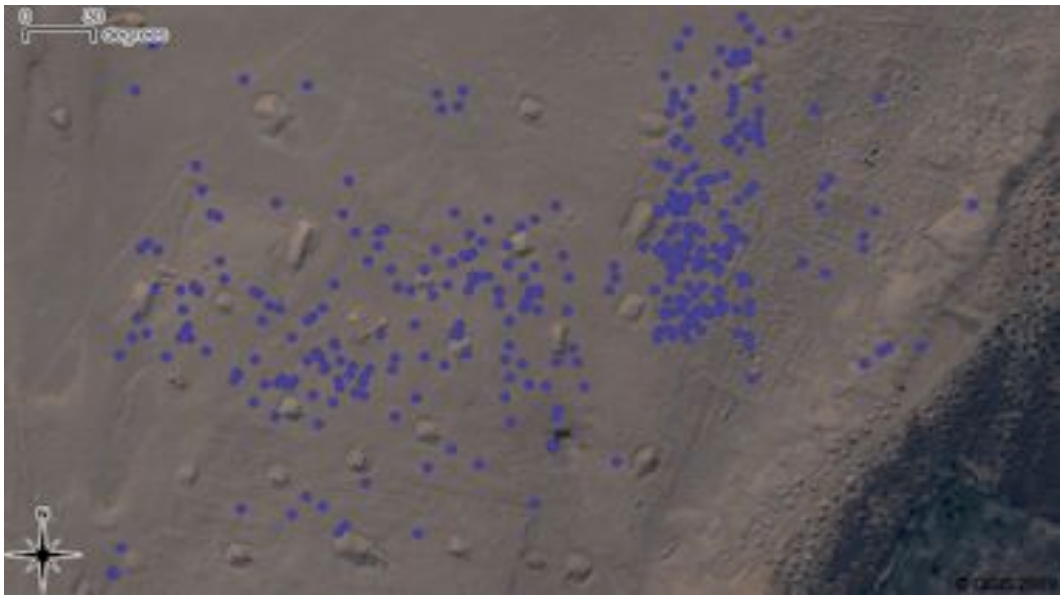

Figure 6: a more detailed view of the satellite image of Gurob, showing the positions of small finds collected in the 2009 season.

Figure 7: Small Find GU09-7: faience scaraboid in the form of a trussed duck with two copper pins inserted into the back.

Figure 8: Small find GU09-280: red faience wedjat eye.

Figure 9: Small find GU09-08: fragment of a small polychrome glass vessel.

Auger boring (Eleanor Hughes)

For the first time in the 2009 season we undertook a programme of auger boring across the site. Eleanor Hughes, assisted by Omar Farouk, undertook geological analysis of sediment cores in the context of the anthropologically derived materials within them. The aims of the augering process are:

- to understand the relationship between modern archaeological surface material and the deeper stratigraphy of the site.
- To understand the ancient and modern land and waterscapes in the context of the development of a human settlement.

In total, 9 fully analysed boreholes were completed across the site. In addition, two transects, Transect A (TA) and Transect B (TB) were completed in key archaeological areas of the site where the depth of archaeological stratigraphy is uncertain. Appendix 2 provides a full description of the locations, depths and salient archaeological and geological findings within boreholes, and Figure 12 shows their locations across a satellite image of the site.

Sediment sorting was completed with tweezers, and different clasts were sorted into groups by size fraction. The different types of clasts were recorded, including the rounding and numbers of clasts for each of the two fractions. The fabric, weight and number of sherds for each fabric group were recorded, and vessel sheets were completed for any diagnostic sherds.

Figure 10: Sorting of sediments at Gurob.

Figure 11: Auger boring at Gurob.

Interpretation of the boreholes: archaeological significance

Cores are able to show not only the depth of archaeological material (as in TA01-04 and TB01-04), but also the type and abundance of archaeological material. For example, borehole AS01 contains archaeological data at all depths down to 475cm, but is underlain by clean sand. This indicates an ancient feature which was originally built on virgin land. The comparison with AS03, which is composed entirely of clays, is interesting as the clayey material indicates a relatively deep body of slow moving water, immediately next to or close to an archaeological settlement.

Interpretation of the boreholes: geological significance

The more geologically significant cores, AS03, AS04 and AS05, represent riverine, wadi and evaporitic lake deposits respectively. They indicate the significant variation in geological processes over the site. This includes modern erosive processes with remove material from the site – the wadi (AS04) – to ancient fluvial deposition – the ancient waterway (AS03) – to geologically ancient evaporites which completely underlie the site (AS05).

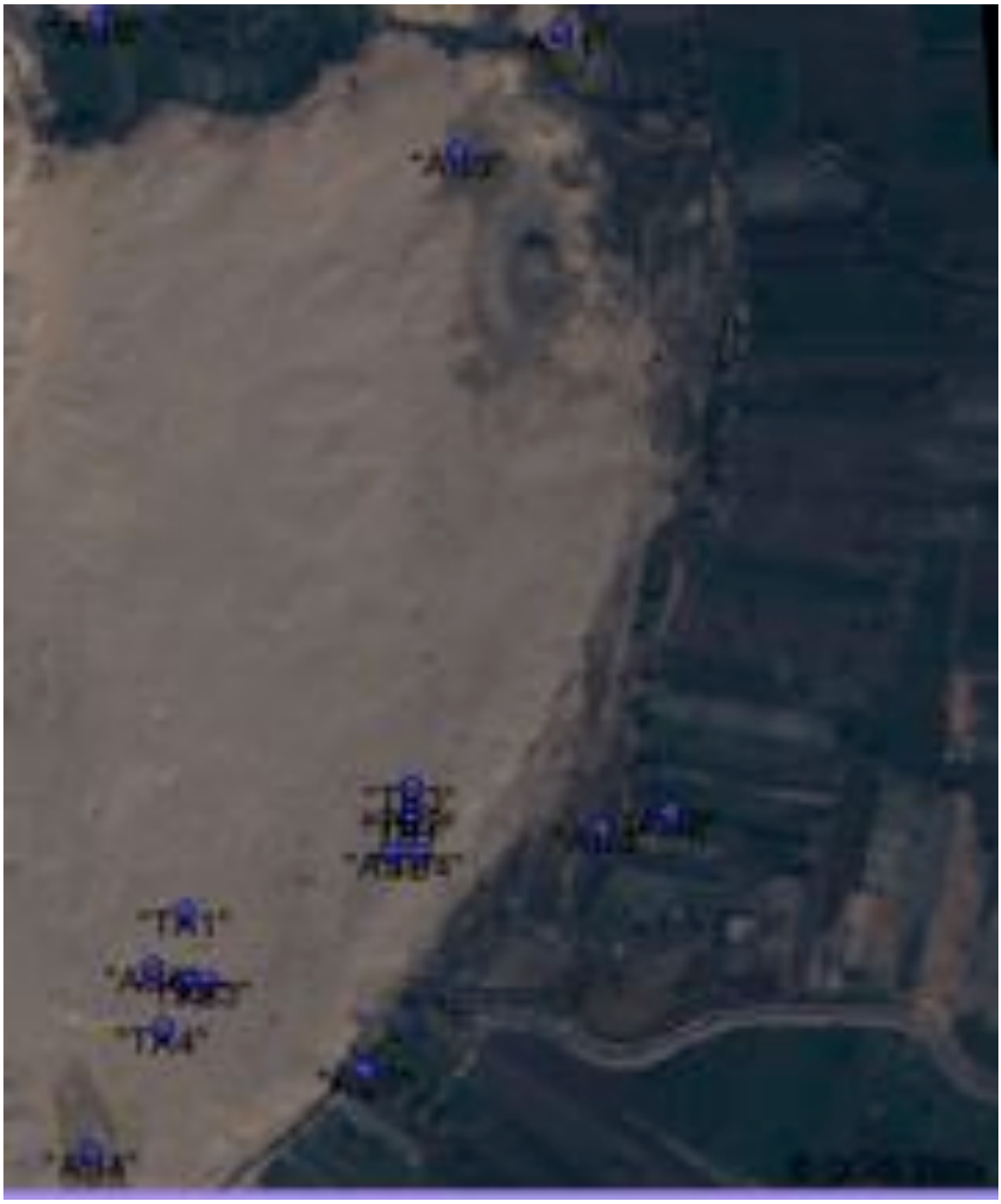

Figure 12: the locations of the auger boring points in the 2009 season.

Ground probing radar survey (Kristian Strutt)

A Ground Penetrating Radar (GPR) survey was conducted over the main area of the palace complex. The technique uses high frequency radio waves to detect variations in buried deposits, measuring the two-way travel time in nanoseconds (ns) for the waves to

be transmitted, reflect off buried objects, and return to the receiver. This technique was applied with the aim of locating structural remains of the buildings of the palace complex, and as a complementary approach to the magnetometer survey conducted in previous seasons.

The survey was carried out between 18th and 20th April 2009 by Mr Kristian Strutt from the University of Southampton, with the assistance of Omar Farouk and Nadia Mahmoud. The GPR data were collected using a Sensors and Software 500 mHz antenna transported with a Noggin Smartcart. Traverses were surveyed at 0.5m intervals across the survey area in an east – west direction, with trace measurements taken at 0.025m intervals. Data were measured to a maximum of 60ns in two-way time, covering an area of 1.2 hectares. Data were downloaded from the GPR in WinPXFER and were processed using GPR-Slice software. and a series of time slice plans were produced for different depths in the survey results.

Figure13: the GPR in use at Gurob.

Cleaning the kiln areas previously excavated by Brunton and Engelbach in gridsquares N8-9 (Dan Boatright and Anna Hodgkinson)

Dan Boatright and Anna Hodgkinson cleaned an area previously excavated in 1920 by Brunton and Englebach and determined to be of significance in the 2006 geophysical report (Herbich 2006), in which the plot showed a roughly circular anomaly believed by Herbich to be a furnace. On surface examination of this area (designated ‘kiln area 1’) a

large number of fragments of slag were observed and collected, along with pottery and pieces of fired mudbrick for study. Initial cleaning took place, starting from the corner of the north-east sector of gridsquare N9, and the feature was followed into gridsquare N8, with pottery, slags and mudbrick being collected separately.

An area of burned sand and mud brick was revealed in the north-eastern corner of square N9 (Fig.9), which corresponds with an anomaly observed in the same location on the geophysical plot (Fig.10). Further cleaning of the surface to determine the extent of this feature revealed standing remains of burnt mudbrick with vitreous material party attached to it and therefore believed to be in situ. Pottery was discovered within the fill of the walls and the estimated inner extent of the feature.

Figure 14: Kiln area 1 at Gurob, after cleaning.

Initial pottery analysis conducted by Ashraf el-Senussi and Virpi Perunka (see pottery report above) confirmed the feature to date to the New Kingdom on the basis of typology and material. A number of burnt pieces of pottery with marks of charring were also collected and analysed in the same manner as above. Main vessel types included meat- and beer jars as well as some examples of decorated ware, and small find 183 was also found within the kiln wall.

The analysis of the structure revealed that fired mud brick had collapsed into and out of the structure, which resulted in the initial difficulty in locating the *in situ* structure. In addition the orientation and position of the various slags prevented a comprehensive determination of the structure; this was later overcome when a large mass of vitreous

material was found along the eastern inner kiln wall. Early analysis of vitreous material has resulted in the identification of three different types of slag determined by colour and appearance. Slags have been sorted by initial appearance and diagnostic examples have been photographed for later study and comparison. Pottery is to be analysed within the Gurob pottery analysis scheme. Both structural features have been photographed, planned at 1:20, and plotted by Total Station and the geophysics plot overlaid with the resulting survey data (Fig. xx).

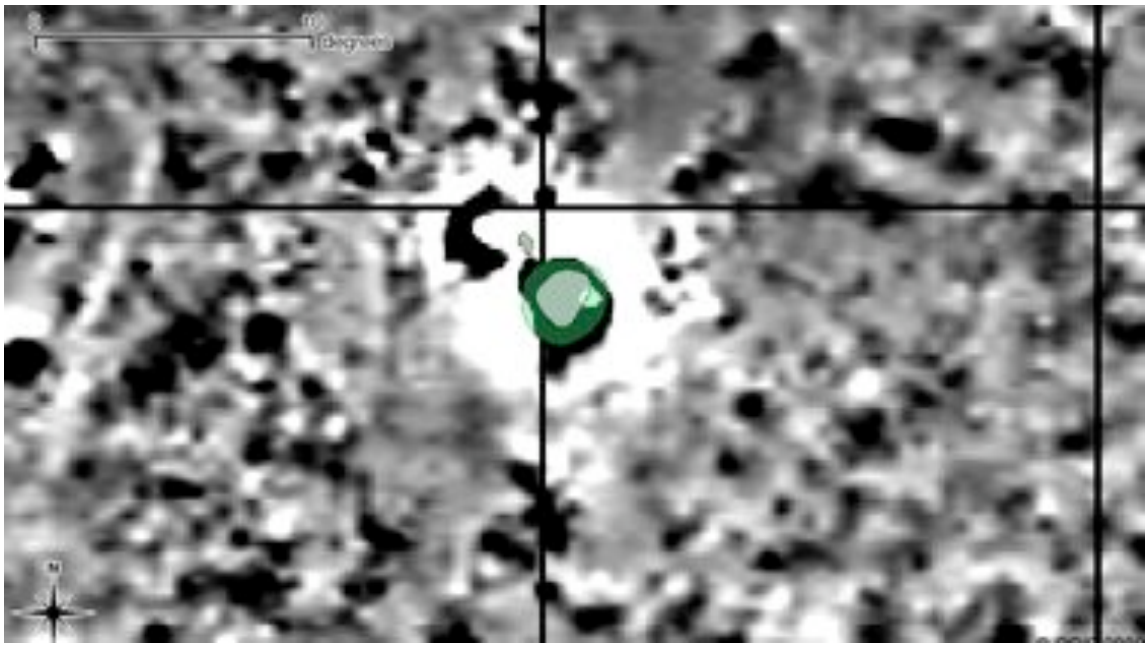

Figure 15: the superimposition of the plan of kiln area 1 onto the geophysical plot created in the 2006 magnetometry survey at Gurob.

Cleaning a stratigraphic section in a small area of surviving kom material in the agricultural area to the north-east of the main site (Daniel Boatright and Eleanor Hughes)

Dan Boatright and Eleanor Hughes, assisted by Omar Farouk, studied a small area of surviving kom material, where the land has been lowered several metres for farming activity. As a result the human activity and geological features of the region over the past few thousand years have been revealed. Claire Malleson, in her fieldwork in 2008 (pers. comm.), noted that the top of the section reflected the landscape height in 2008 so this is a reasonably fresh cut. The stratigraphic section as a whole is *c.*10m wide and 5m high, and the actual section drawn was 3m long and 2.5m deep, reflecting the natural geological features and the total human occupation that is visible. The area was cleaned to reveal the full structure.

Geological description

The section shows that the two main soil types, the sandy drier loose matrix, and the silty more consolidated material, generally alternate between one another, suggesting that each reflect different periods of natural weather activity (i.e. hot drier periods followed by wetter periods) or alternatively these could be the result of human activity. The layers appear to become thicker further down the section, with the layers between 0.5 and 1m almost merging into one another with rapid frequency. Top surface layers, in the first metre, are relatively stable, with stratigraphy consistent. The layers have begun to collapse from 80cm below the surface, which reflects the geology of the Faiyum region, where folding of stratigraphy is common and relatively quick. The surface is relatively free of rocks, with a few larger sandstone pebbles, common for a near-desert region.

Archaeological description
There is evidence of human activity in several layers of the section, and they appear to be synonymous with the silty deposits. Large mud bricks are found in all silt layers throughout the section, and at 1.5m and 1.8m there are a number of sherds that could possibly date to the New Kingdom. In the same area charcoal is frequent, especially in the south side of the section. At 2.05m a large expanse of two mud0brick areas are found, both containing relatively little in sherds or other material. The consistency and design of these two structures clearly differ between one another, with a clear unconformity, and show two periods of occupation. At 2.4m an inscribed flat rock was found, which has been positively identified as a piece of stelae.

The sand layers are relatively devoid of human activity, though they have a number of large patches of limestone. This is clearly visible towards the surface, between 0.3 and 0.5m. A further large limestone area is found in between a silt and sand layer, and may be the result of natural slippage, or a human action. This is difficult to estimate due to the relatively small area this occurs within.

Summary

In the fifth season of work at Gurob we made excellent progress on several elements of our overall plan for the site: mapping, pottery surface collection, auger boring, geophysical survey, and cleaning of previously excavated features. As well as recording many of the basic surface and sub-surface features of the town site, we have also begun to map the cemetery areas in the northern, eastern and western parts of the site. We are also now well advanced in producing a fundamental corpus of the characteristic fabrics and forms of pottery vessels at Gurob, which can then be compared with the existing New Kingdom corpora at Amarna, Memphis and other urban sites.

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Appendix 1: Pottery: raw data

The total quantity of pottery from the surface collection, according to gridsquares, is:

SQUARE/GRID: D18 A
Nile sherds 1556
Marl sherds 987
Total 2543

SQUARE/GRID: H 17 C
Nile sherds 4981
Marl sherds 4038
Total 9019

SQUARE/GRID: K 18 B
Nile sherds 2133
Marl sherds 2526
Total 4659

SQUARE/GRID: L 15 A
Nile sherds 271
Marl sherds 229
Total 500

SQUARE/GRID: M 14 C
Nile sherds 315
Marl sherds 337
Total 652

SQUARE/GRID: N 8 D
Nile sherds 5245
Marl sherds 1707
Total 6952

SQUARE/GRID: Q 7 A
Nile sherds 2254
Marl sherds 1820
Total 4074

SQUARE/GRID: K 10 D
Nile sherds 1310
Marl sherds 1133
Total 2443

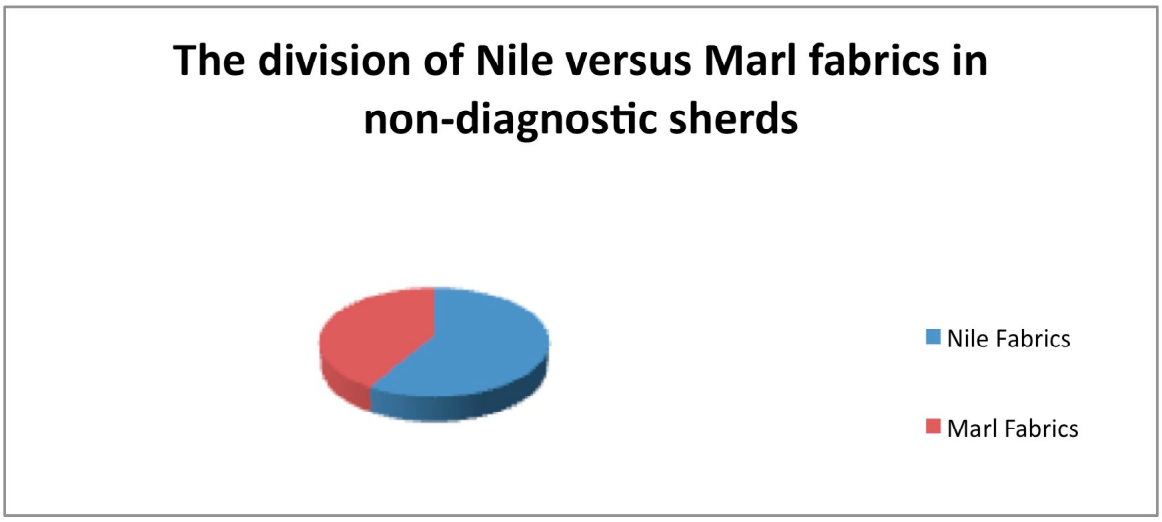

Figure 16: The total number of Nile sherds is 16509 and Marl sherds 11790.

UTM N	UTM E	Level (masl)	Description of Location	Depth of Pottery (cm)	Depth of Clean Sand (cm)	Total Depth (cm)	Archaeology	Geology	Depth explanation
301106	3231661	22	Field to North of Site in Ridge (NE)	475	533	575	Pot sherds, Mudbrick, Bone and charcoal present from surface down to approximately 5m. One Small Find: Calcite Bead at approximately 405cm below the surface.	Mostly Coarse Grained and Sandy. Contains large amounts of Halite (Salt), Gypsum, Calcite (both crystalline and as limestone nodules) and Quartz in the form of flint and Quartz grains.	At depth below watertable Sands become unstable and the walls of the core eventually collapse.
301130	3231978	28	East of Site Near Ephemeral Lakes, East Side of Minor Canal (SE)	N/A	N/A	220	None except "contamination" of surface core.	Material found to be "imported", ie clays obtained away from the site mixed with the original sandy material.	Very concentrated clays with little water at depth are too hard to move auger through.
301065	3231968	30	East of Site Near Ephemeral Lakes, West Side of Canal (SE)	416	N/A core made of clays	361	Pot sherds, Mudbrick, present until 416cm depth. Final two cores lack archaeological material.	Silty Sands at the surface are quickly replaced by clays at depth, which is continuous until the base of the core. Very Fine grained. Final two cores are a different grainsize and colour and are totally lacking in clasts, including archaeology.	Very concentrated clays with little water at depth are too hard to move auger through.
300597	3231735	27	Wadi Deposit (SW)	30	30cm	160	Some surface sherds present due to erosion of areas of the sight containing archaeology, and deposition in the Wadi area. Below 30cm no archaeological material is present.	Silty Sand at surface, becomes coarser after ~ 50cm and cores consist exclusively of sands, graded with coarse material at base of core.	At depth below watertable Sands become unstable and the walls of the core eventually collapse.
300834	3231785	18	Southern Fields, South of Road (SW)	20	N/A	170	Some surface sherds present due to contamination of upper two cores from mixing of material external to area.	Very high concentrations of halite, gypsum and calcium carbonate nodules. Deposits consist of beds of marl/clay interspersed with evaporites layers.	Evaporite Deposits are very hard and prevent the auger from going deeper.
300666	3231891	22	Palace Complex (SW)	189	209	209	Core within Palace Complex, highest concentrations of pottery at surface, pottery absent below 189cm.	Archaeological silts make up surface cores, replaced by silty sands then clean sands lacking clasts.	Sand can become unstable and the walls of the core eventually collapse.
300885	3231968	29	"Fort" Complex Nr Kilns (SE)	25	N/A	84	Sherds present in top 25cm of core, but lacking in deeper cores.	Archaeological silts make up surface cores, replaced by silty sands then clean sands lacking clasts.	Evaporite Deposits are very hard and prevent the auger from going deeper.
300906	3231716	23	Fields Near Ancient Rammesside Tombs (NW)	N/A	N/A	60	Some surface sherds present due to contamination of first core from mixing of material external to area.	Silty sand in top core is quickly replaced by v finegrained clays at depth.	Evaporite Deposits are very hard and prevent the auger from going deeper.
301004	3231565	20	Salty Marsh Near North of Site (NE)	N/A	N/A	195	Pot sherds present throughout the core until base.	Silty and clayey sands near surface are replaced by sands then by very coarse sands at base.	Evaporite Deposits are very hard and prevent the auger from going deeper.
300691	3231922	24	Transect A: Through Fort Complex Nr Kilns (SE)	10	N/A	42	Short Auger to establish depth of archaeology over large area.	Same as within AS07 (See above)	Evaporite Deposits are very hard and prevent the auger from going deeper.
300689	3231873	26	Transect A: Through Fort Complex Nr Kilns (SE)	0	N/A	40	Short Auger to establish depth of archaeology over large area.	Same as within AS07 (See above)	Evaporite Deposits are very hard and prevent the auger from going deeper.
300708	3231874	24	Transect A: Through Fort Complex Nr Kilns (SE)	9	N/A	60	Short Auger to establish depth of archaeology over large area.	Same as within AS07 (See above)	Evaporite Deposits are very hard and prevent the auger from going deeper.
300661	3231842	31	Transect A: Through Fort Complex Nr Kilns (SE)	10	N/A	50	Short Auger to establish depth of archaeology over large area.	Same as within AS07 (See above)	Evaporite Deposits are very hard and prevent the auger from going deeper.
300900	3231997	29	Transect B: Through Palace Complex (SW)	0	20	50	Short Auger to establish depth of archaeology over large area.	Same as within AS06 (See above)	Sand can become unstable and the walls of the core eventually collapse.
300901	3232002	38	Transect B: Through Palace Complex (SW)	0	30	40	Short Auger to establish depth of archaeology over large area.	Same as within AS06 (See above)	Sand can become unstable and the walls of the core eventually collapse.
300907	3232020	32	Transect B: Through Palace Complex (SW)	0	0	39	Short Auger to establish depth of archaeology over large area.	Same as within AS06 (See above)	Sand can become unstable and the walls of the core eventually collapse.
300912	3231971	33	Transect B: Through Palace Complex (SW)	0	0	26	Short Auger to establish depth of archaeology over large area.	Same as within AS06 (See above)	Sand can become unstable and the walls of the core eventually collapse.