Fig. 1
Map of Kubbaniya with the location of the Nag el-Qarmila sites.

Fig. 2
Plan with location of the Nag el-Qarmila settlement and the cemeteries.
Predynastic settlement and cemeteries at Nag el-Qarmila, Kubbaniya

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The Predynastic settlement and cemeteries discovered in Nag el-Qarmila are the southernmost preserved evidence of a Naqada domestic and funerary site (apart from Elephantine). Both radiometric dates and pottery analysis suggest a main use of the site during the first half of the 4th millennium (c. 3800-3600 BC), while a younger phase dated to the end of the millennium is recorded only on the surface. A Nubian influence is detected in many aspects of the material culture. Nag el-Qarmila is definitely a unique site for the understanding of the interaction between Egyptians and Nubians in their borderland.

Introduction

The Predynastic archaeological site of Nag el-Qarmila is situated at approximately 17km north of Aswan (fig. 1), on the west bank of the river Nile at the mouth of a wadi with a small catchment area, just north of Wadi Kubbaniya. It consists of a settlement with two associated cemeteries (fig. 2). According to the pottery, the excavated part of the settlement (WK15-B) and the northern cemetery (WK14-A) date to Naqada IC, eventually continuing into Naqada IIA, with Naqada IIC-III A2 sherds recorded on the surface. The radiocarbon dates from the stratigraphical sequence confirm the chronology established by the ceramic material. This is a preliminary report of the first two field season investigations (2007-2008).

Geology of the surface materials, geomorphology and geo-archaeology

A survey of the geology of the surface materials and the geomorphology was conducted in order to understand the geo-archaeological context of the site. Observations were made on a number of key-points...
Fig. 3
Situation of the observation points and major geomorphological units; map based on Google Earth.

Fig. 4
NNE-SSW profile across the wadi valley showing the geology of the surface materials and the major geomorphological units (situated on fig. 3).
The number of observations is limited but allows however for a preliminary interpretation, which is illustrated by a 370m-long NNE-SSW profile across the wadi valley (fig. 4, situated on fig. 1). The wadi valley is completely eroded in a plateau consisting of a bedrock of fluvial sandstone belonging to the Upper Cretaceous 'Umm Barmil Formation' (Kub). This rather soft sandstone with a purplish colour is exposed on both wadi valley sides. The northern valley side is a simple rectilinear slope. The southern valley side is more complex: two rectilinear slope segments are separated by a very gently sloping structural rock terrace. The lower part of this terrace is marked by a dramatic convex slope change. The alluvial fill of the valley floor is only a few meters thick and comprises of different lithostratigraphical units. The oldest unit is formed by a river terrace composed of medium sandy sediments. In the upper part abundant root casts, formed by the infilling of Ca-carbonate in former root tubes, are present in situ. They testify to a warm humid climate with well developed vegetation, most probably of the savannah-type. The density and the hardness of the Ca-carbonate suggest a Middle Pleistocene age. The incision of the Middle Pleistocene valley base sediments took place in the southern part of the valley floor. As a result the Middle Pleistocene river terrace was only developed at the foot of the northern valley slope. The limit between rocky valley slope and sandy terrace is marked by a clear concave slope change. The younger sediments comprise of an up to 2m thick and very hard layer of dark, compact silts that were deposited by the catastrophic floods of the 'Wild Nile' stage at the transition Late Pleistocene/Holocene Periods. This compact layer forms in the landscape a narrow strip with a width of a mere 73m; it is separated from the Middle Pleistocene river terrace and from the present-day alluvial valley floor by concave slope changes. The compact silt layer is topped by a layer of mixed silt and sand with a thickness of only tens of centimetres; the presence of charcoal and sandstone flakes testifies to an anthropogenic origin. The present-day valley floor is situated in the southern part of the wadi valley. It is separated from the southern rocky valley slope by a concave slope change and filled by Holocene alluvial sediments comprising two distinct units. The lower one, below the actual Nile floodplain level (at 91.34m a.s.l.), is composed of mainly Nile floodplain silts interfingered with thin layers of fine to medium sand; the silts were deposited during the yearly Nile floods while the sands are wadi sediments deposited during the rare winter rains. The sediments above the actual Nile floodplain level are exclusively coarse to medium sandy wadi deposits; the presence of sandstone and root cast fragments shows that they are the result of the erosion of the rocky valley slopes and the Middle Pleistocene river terrace. The whole landscape is covered by a discontinuous veneer of yellow medium sand. This sandy layer is the result of persistent aeolian activity. The major sand source is the Middle Pleistocene river terrace. The aeolian activity is corroborated by the presence of a lag of root cast fragments on top of the terrace. Differential wind abrasion on the rocky valley slopes offers additional proof of important and persistent aeolian activity. The physical environment of Nag el-Qarmila presented a number of opportunities and constraints to the activities of Predynastic people. The rocky plateaux above the site offered an unhindered long distance view of the surrounding landscape. The nearby Nile and its floodplain allowed for fishing and hunting birds and offered reed for construction. The thalweg of the alluvial valley floor was most probably between 2 to 3m deeper than it is at the present day. As a consequence, it was affected by the yearly Nile flood. The thalweg is situated at the fringe of the Nile floodplain, resulting in a shorter alluvial season due to

2. The X- and Y-position of each observation point was measured by a hand-held GPS navigator (Garmin GPS 12XL) in UTM-coordinates on the 'Old Egyptian' map datum. The estimated accuracy of the averaged position (FOM = Figure of Merit) ranged between 3.1 and 4.1m. The X- and Y-position and the altitude Z of the observation points were also measured by means of a total station. As zero-level for the Z-measurements the water level of the Nile near the site and at the day of the measurement was chosen. It was estimated at 84.00m above sea level, taking into account the water level of the Nilometer at Aswan was 85.20m a.s.l on the day of the measurement (13.02.2007) and a drop of 1.20m over the distance of 17km between Aswan and the site (the mean drop of the Nile level is about 70mm/km).
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the relatively late start and early receding of Nile flood waters. The aquifer in the sandy silt of the lower alluvial infill was recharged on an annual basis by the Nile flood and sporadically by winter rains. As a consequence, the water table reached close to the surface throughout the year. By damming the upslope part of the thalweg when the flood started to wane, it was possible to catch part of the flood water in order to obtain a reservoir that could be used to irrigate the down slope part of the thalweg when it was dry again. Considering these hydraulic conditions, agriculture must have been possible during a major part of the year. However, due to the small area of the alluvial valley floor, yields were limited and could only support a small number of people. Catching fish was possible by installation of traps during the flood. The narrow terrace of 'Wild Nile' flood silts offered excellent opportunities for a settlement: close to the fields in the alluvial valley floor and out of reach of the flood. The compact silt itself was an excellent and abundant resource for making mud-bricks. The flat surface of the 'Wild Nile' terrace was also apt for irrigation: the silt acts as an impervious layer on which the water collects to form ponds. However, irrigation of this terrace implies techniques to raise the water over a vertical distance of 2-3m from the alluvial valley floor. The sandy Middle Pleistocene river terrace was of limited use. Aeolian deflation was a hindering factor for settlement; the high position above the wadi thalweg and the sandy nature of the sediments were forbidding for agriculture even with irrigation techniques. This landscape unit was however suitable for digging graves, which was not the case in the bank of compact and hard 'Wild Nile' silts. Graves were also dug in the rocky southern terrace.

Magnetic survey

In view of the geological conditions of the site and the character of the anticipated features, magnetic prospection was the geophysical method used for the research. The site is located in a wadi, the surface layer consisting of sand and sandstone rubble covering mud alluvium. The surface formation is characterized by low magnetic susceptibility. Due to the presence of iron oxides, mud has strong magnetic properties. The hope for a positive result of the survey was based on a contrast between the magnetic properties of settlement remains and their surrounding: non magnetic fillings of pits dug in magnetic mud; hearths in a sandy surrounding (ashes have strong magnetic properties). The survey covered an area of 6000m² in Nag el-Qarmila. Two zones are clearly visible on the magnetic map (fig. 5): a zone characterized by very stable values of the Earth's magnetic field.

3. Tomasz Herbich (Institute of Archaeology and Ethnology, Polish Academy of Sciences) and Dawid Święch.

4. A Fluxgate-type gradiometer by Geoscan Research, model FM 256, 0.1 nT resolution, was used. The grid applied was 20x20m, with points every 0.125m along lines (20m long) set 0.5m apart. The density of the sampling grid (16 measurements per square meter) guaranteed the recording of even small-size features (e.g., hearths not more than 0.2m of diameter). Measurement data was processed using Geoplot 3.0 and Surfer 8.0 software. Results were presented as gray-tone maps, with white and black corresponding to extreme values.
intensity (in the NW part of the surveyed area) and a zone characterized by anomalous values, within a range of +/-20 nT (in the SE part of the area). The border between zones runs along the NE corner of B3 and the SW corner of E2 and is not reflected in the surface relief. The zone of stable values (the NW part of the area) corresponds to a layer of sand (at least 0.5-1m thick). The disturbances visible in the SE zone can reflect an uneven surface of the mud layer: the areas of high values reflect sections of the layer close to the surface (some of these sections are visible on the surface); the areas of low values most probably reflect hollows filled with sand. Only excavation can determine if the uneven surface of the mud layer is a result of human activity or a natural process.

The results of the survey are greatly disturbed by recent activities: there are roads crossing the area (strips of disturbances visible between B2 and D3 and a strip of disturbances in A2 and A3); a dump of mud (anomalies in the SE part of E3) and several small dumps of mud (circular anomalies 1m in diameter of slightly higher magnetic values, visible in E1 and southern part of D1). Anomalies of a very high range of values (+/- 100 nT and more) visible in the centre of D2 and near the northern border of B3 correspond to metal objects (the anomaly in D2 corresponds to an iron bar inserted for topographical purposes). The blank areas (in A3 and C3) correspond to areas where there was no possibility to take measurements (stone outcrops and walls).

Archaeological investigation at the cemeteries WK14 and WK22

The northern cemetery WK14 was defined by a concentration of artefacts and very poorly preserved human bone. It measures approximately 30x25m and is situated on top of a Middle Pleistocene sandy river terrace. Apart from the many potsherds, which will be described in detail separately, other artefacts were recorded on the surface and in the deposit, including several ostrich egg-shell beads, incised fragments of ostrich egg-shells, lithic flakes mostly of flint or quartz, a few polished stone fragments made of schist (probably palettes) and a schist hand-axe recovered from the surface. A long transect in the central part of the cemetery was excavated and labelled Area A (fig. 6). This long narrow trench, measuring 4x16m and oriented N-S, was selected for excavation in order to perform a preliminary investigation of different parts of the cemetery. Due to the sandy sediment, no clear stratigraphy could be recorded; there was no evidence of cutting, superimposition or disturbance. Four layers were tentatively defined according to: 1) the size and percentage of sand grains in the matrix; 2) the fragmentary root cast size and percentage; and 3) the state of preservation of potsherds and human bone. Coarse elements within the sandy matrix were recorded at a higher frequency in the upper layer (Layer 1), while elements in Layer 4 were smaller. Root cast fragments were common in the upper layers and decreased with depth. Human bone and potsherds were best preserved in Layer 3. Layer 4, which consisted of compact sand and a few root cast fragments and almost no archaeological artefacts, was investigated only in one sector of the excavation area.

The placement of this cemetery in an area of loose sand, in combination with wind erosion, ancient plundering and modern disturbance, resulted in major post-depositional damage to the graves. In general, burials located closer to the surface are completely eroded away, leaving only a deflated deposit of artefacts and poorly preserved human bone on the surface. Material

5. Mindy Pitre, University of Alberta; Maria Carmela Gatto, Yale University.
remaining from these upper strata are displaced and scattered over the area. In the northern part of the cemetery, where the ground surface is more level, and at the deepest point of excavation, one intact burial was found (Tomb 14 described below). The burial’s preservation suggests that graves in the lower stratigraphic layers were less subject to post-depositional disturbance and probably still remain intact. Bone clusters were mostly recorded within Layer 3 and in the southern squares of the excavation they are almost absent. These clusters, interpreted as remains of burials, were classified as “tombs”. Some of the skeletal elements had small amounts of organic material preserved on them, possibly cloth, leather or skin and in two cases (Tombs 2 and 14) there was green staining, likely evidence of malachite or copper.

Osteoarchaeology: results at WK14

For the most part, the quality of bone from the WK14 cemetery was poor, as was the integrity of the individual burials. Because of post-depositional events mentioned above, the skeletal material has been churned and scattered, probably on repeated occasions over the centuries and has weathered at different rates. Seventeen clusters of human bone and one complete burial (Tomb 14) were noted. On occasion, it was possible to identify bones belonging to discrete individuals in several of the clusters (e.g., Tomb 1, described below). In most cases however, articular ends were destroyed and it was difficult to come to such conclusions. As a result, for most of the material including the scattered fragments and clusters, relatively little information was able to be collected in the field. Elements from throughout the body were found including material from both the appendicular and axial skeletons. Typically, those that remained intact were small irregular or tubular bones such as carpals, tarsals and metacarpals that have a higher bone density in comparison to more friable bones such as the ribs and sternum. However, some cranial, vertebral and costal material was recovered in good condition. Several comminuted long bone shaft fragments were discovered. Fragments ranged in size from <1mm to the presence of completely preserved skeletal elements. Both adult and juvenile material was discovered.

Of the WK14 skeletal material, including surface finds and those removed during the excavation, only Tombs 1 and 14 were analysed. This analysis followed the protocols described in Buikstra and Ubelaker (1994). Stature estimates were established using the modified formulae presented by Robins and Shute (1986). The preliminary osteological analysis as well as the archaeological context is described below. Tomb 1, one of the larger clusters of human skeletal material, was found in Layer 3 at the eastern edge of the trench between 30 and 60cm below the surface (fig. 7). This cluster consisted mostly of elements from the appendicular skeleton including femora, tibiae, fibulae, radii and ulnae. Three cranial fragments were also associated with this cluster but may not belong to the same individual. Based on the preliminary analysis carried out in the field, the individual was an adult, most likely female. Some skin or other dark brown organic material was observed on one of the femora. No pottery or other artefacts were associated with the remains. Though the bones were not in anatomical position, they were not as disturbed as the rest of the material coming out of the cemetery. Additionally, the skeletal material from Tomb 1 was better preserved compared to that of the other clusters. Unfortunately, the condition of the material did not allow for any hypotheses concerning the original burial position and/or direction to be

6. Mindy Pitre, University of Alberta.
made. The skeletal material was sloping down towards the west, which may suggest that the pit where the bones were originally placed was lately partially cut on its western side. However, the soil around the cluster is very similar to the rest of Layer 3; the only differences being a few small rocks and tiny reed fragments, so no pit or later cut could be clearly defined.

Tomb 14 (fig. 8) was found below 1.2m of sand in the northern section of the trench (Square O2). The burial was that of a young woman tightly contracted in a very unusual position. The body was oriented with the head to the northwest and the feet to the southeast. The legs were semi-flexed toward the east (lying on the left side) while the upper body was lying flat and the head was positioned upright with the chin on the chest. This resulted in the individual facing southeast, or upstream of the Nile. The right arm extended toward the left shoulder with both hands rested on the left shoulder. The size and shape of the burial pit were peculiar, a very small concave oval area measuring 80x53cm. A third unusual feature of this grave was the miniature Black-topped jar (described below) found close to the occupant’s right shoulder. The sides of the tomb were plastered with mud and possibly leather. The body, resting on the sand, was covered by matting and linen, the latter most likely on the lower limbs. Both the matting and linen were very badly preserved. Other funerary offerings found in the grave include a pebble and pieces of malachite close to the chin, as well as a small basket with malachite fragments inside, found in the left abdominal area.

Further osteological analysis revealed that the individual buried within Tomb 14 was between the ages of 20-25 years and would have stood approximately 151cm tall.

The palaeopathological analysis revealed no visible skeletal signs of physiological stress either on bone or the dentition. A few minor errors in development that have the potential to suggest group affinity once the entire cemetery is analysed were noted including two wormian bones in the lambdoidal suture, a cleft right transverse foramen of the second cervical vertebra, both hypoglossal canals exhibited a Type I spicule and a cleft spinous process of the first sacral segment. The inferior articular facets of the eleventh thoracic vertebra exhibited evidence of a subtle cranial shift at the thoracolumbar border (see Barnes 1994). There was no other visible evidence of disease, nor was there any indication of how this young female died.

The southern cemetery WK22 was found only during the last days of the 2008 field season, thus the information we have at the moment is very scanty. However, because of its location on the first gebel terrace, the pits are dug into the sandstone and this provides hope for better preservation of the graves. Moreover, little human bone or sherds are visible on surface and it does not seem that the area has been damaged by modern activities, meaning that there is a chance for better preservation compared to cemetery WK14. At the moment, no chronological attribution can be suggested.

The settlement WK15

The settlement was identified by a surface scatter of approximately 50x100m. It is situated on the northern side of the wadi, on top of the “Wild Nile” deposit. On its south eastern side the site is heavily disturbed by modern activities, including building constructions. A 5x8m excavation unit, roughly

7. Maria Carmela Gatto, Yale University; Elizabeth Hart, Virginia University; Sara Roma, University of Naples “L’Orientale”.

Fig. 8
The intact tomb (T14) found in WK14-A.
oriented N-S and designated Area B, was opened in order to evaluate the nature and state of preservation of the settlement. Area B was positioned in the central part of the surface scatter at neither the highest nor lowest point so as to avoid large amounts of sand that may cover the remains, and furthermore to avoid the more eroded areas (see fig. 2). At the top of the stratigraphic sequence there was a very thin and deflated layer (1) of cobbles, aeolian sand and archaeological material. Below it there was a layer of aeolian sand (2), absent to the south, deeper to the north and basically with no archaeological material. This may correspond to a possible sand dune recorded during the geomagnetic survey that seems to cover the eastern part of the settlement and the entire northern cemetery. Layer 3 lay right below the sand, while to the south it was found directly below the surface. The matrix was loose, light yellow sand containing variable amounts of greyish brown silt, in thin laminate layers and loose patches, with the percentage of silt increasing toward the south. In association with it were two small hearths (H1 and H3), both located to the central-southern section of the excavation. At its top the remains of an acacia bush were recorded and radiocarbon dated to \(4230\pm50\) B.P., 2821-2630 cal. B.C. (IFAO 152).

Next in stratigraphic position was Layer 11 (fig. 9), representing the first clear occupation surface. Associated with it were two working/living surfaces. F2, located in the north western corner of the area, consisted of burnt sand. Notable artefacts found on top of this surface include an ivory bracelet fragment and a frag-

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8. At the moment this is just a hypothesis that has to be confirmed or disproved by more field observation.
ment of a model boat, with a hole to put the oar through. H4, located to the south of the excavation, was comprised of more concentrations of ash-dark sediment. In association with lithics, potsherds, animal bones (including fish) a bone awl and a spot of charcoal; the latter radiocarbon dated to 4955±50 B.P., 3806-3644 cal. B.C. (IFAO 153). A shale tempered deep bowl, found in situ to the eastern side of the area (fig. 10), more likely had to be related to this phase. For the following occupation events, which comprised the bottom part of the stratigraphy, a clear chronological sequence was difficult to distinguish (fig. 11). Indeed, the features found in association are of two different types: hearths, the lifespan of which may last for a very short time possibly for only a single use, as well as postholes, mud-lined pits and in situ pots, which of course have a longer lifespan.

A concentration of four hearths in stratigraphical sequence was recorded in the north western corner, directly underneath F2 (fig. 12). Two mud-lined pits (F3 and F4) were found to the east of the hearths (fig. 13); while postholes, including one of the so-called calage en pot type (Midant-Reynes & Buchez 2002: 41-43; Anderson 2006: 115-117; Tristant 2004: 106), were found in the southern half of Area B, all in association with a floor labelled F12. The lowermost hearth in the sequence, H6, was radiocarbon dated to 4917±50 B.P., 3799-3635 cal. B.C. (IFAO 151). The hearth was capped by a thin layer of rubified sand and a concentration of broken rocks and artefacts.

Two other isolated potential postholes were found below the floor F12; at this time however their anthropic nature cannot be confirmed. On the sterile soil level below F12, the root of an Acacia tree was found and radiocarbon dated to 5040±50 B.P., 3956-3712 cal. B.C. (IFAO 154).

The final aspect of the settlement was the presence of pits that cut through the cultural layers resulting from quarrying the silt deposit, more likely dated to the late Naqada Period, although this supposition has to be confirmed. Among the artefacts found during the excavation, those worth mentioning include two fragments of two different clay boat models (one of which has already been mentioned) and a copper earring or ring (figs. 14-15).

Upper and lower grindstones and a possible stone mortar were found as well, with varying degrees of preservation.

The Pottery from WK14 and WK15

The pottery from Nag el-Qarmila is dominated by two types of fabrics, Nile silt and Shale tempered (tab. 1). The first consists almost exclusively of Nile A (Nordström & Bourriau 1993:

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For WK14-A, a total of 1405 sherds were studied, out of which 296 diagnostic sherds were given individual numbers. After looking for joining fragments and applying a minimal number count from the rims, the material represents at least 178 individual vessels. The vessels identified from the diagnostic sherds show the same fabric distribution as the totality of the sherds.

For WK15-B, only the diagnostic sherds, 211 representing at least 192 individual vessels, have been studied. Presumably they will, as for WK14-A, reflect the whole ceramic assemblage.

**Tab. 1 • WK14-A vs. WK15-B. Fabrics of identified vessels.**

<table>
<thead>
<tr>
<th>Fabric</th>
<th>#</th>
<th>%</th>
<th>#</th>
<th>%</th>
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<tbody>
<tr>
<td>Nile</td>
<td>107</td>
<td>60,1</td>
<td>68</td>
<td>35,4</td>
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<tr>
<td>Shale</td>
<td>51</td>
<td>28,7</td>
<td>99</td>
<td>51,6</td>
</tr>
<tr>
<td>Marl</td>
<td>6</td>
<td>3,4</td>
<td>17</td>
<td>8,9</td>
</tr>
<tr>
<td>Nubian</td>
<td>11</td>
<td>6,2</td>
<td>8</td>
<td>4,2</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>1,7</td>
<td>0</td>
<td>0,0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>178</td>
<td>100,0</td>
<td>192</td>
<td>100,0</td>
</tr>
</tbody>
</table>

**Fig. 16**

Pottery.
1-9: Black-topped (Nile A);
10-12: Red-polished (Nile A);
13: Nile B;
14-17: Shale tempered;
18-22: Marl;
23: Fine shale and organic tempered;
24-27: Nubian.
Predynastic settlement and cemeteries at Nag el-Qarmila, Kubbaniya

170-171; Friedman 1994: 141-142) and was used for the production of Black-topped (fig. 16.1-9) and Red-polished (fig. 16.10-12) pottery. There are only a few sherds of Nile B and Nile C fabrics (Nordström & Bourriau 1993: 171-174). For the Shale tempered fabric (fig. 16.14-17), three different variants were identified: Coarse shale, Fine shale and Fine sandy shale, of which Fine shale represents about 55%. However, in reality they make up a continuous series and the group boundaries are to be considered artificial, which is especially so for the Fine shale and Fine sandy shale. The paste of the Coarse shale consists of silty ferruginous clay with some inclusions of fine and medium-textured sand. It is tempered with crushed, platy shale particles, up to 3-4mm in size. There are also some natural or deliberately added whitish clay particles that may be of local origin (see below). The ceramic material is rather soft and the fractures are often a bit crumbly. The firing temperature can be estimated to between 600 and 700°C. The paste of both the Fine shale and Fine sandy shale consists of fairly silty but homogeneous ferruginous clay with some mineral inclusions, mainly of fine sand. It is tempered with shale particles, generally in sizes up to 1mm and has some inclusions of whitish clay particles11. The diagnostic trait of the Fine sandy shale is the balanced proportion between fine sand and shale. The firing temperature of both variants can be estimated to between 700-750°C. Their transverse strength is generally moderate to high. The porosity has a characteristic microstructure with numerous tiny, round or elongated, pores. Beside the two main fabric groups, there is a limited number of Marl clay sherds, all of them Marl A1 (Nordström & Bourriau 1993: 176) (fig. 16.18-22). Finally, there is an equally limited amount of Nubian pottery, most of which corresponds rather well to the Nubian Fabric IIA tempered with a mixture of sand and ashes (Nordström 1972: 51), while other sherds are straw-tempered. All are typical of the Nubian tradition. Nearly all, however, display characteristic whitish inclusions that may originate from a natural or intentional admixture of an iron-free clay or soil attesting a local origin12. A petrographic analysis of these aggregates yet to be made, should resolve this problem. These local variants correspond to the black-topped Nubian wares H4.11 and H4.12, with red-coated plain or rippled exterior surfaces (fig. 16.23-27) (Nordström 1972: 64-65).

The chronology of the Naqada culture is almost exclusively based on information from cemeteries (Hendrickx 2006), in which Shale tempered pottery hardly ever occurs. The chronological study of the material from Nag el-Qarmila is therefore largely based on the Nile silt pottery, representing Petrie’s Black-topped and Red-polished classes (Petrie 1921). The almost complete absence of Marl and Nile C pottery from the excavation layers points to a date in the Naqada I or early Naqada II Period. The vertical distribution of the fabrics over the layers at both sites strongly suggests that for the Nile and Shale fabrics, there is no significant difference between the layers distinguished. This is confirmed by the vertical distribution of the Black-topped and Red-polished sherds. If there would have been a chronological difference, more Black-topped pottery might have been expected in the lowest layer because the dominance of Black-topped over Red-polished pottery diminishes over time during Naqada IA-IIB (Hendrickx 2006: 73, tab. II.1.4b). But although there is somewhat less Black-topped pottery for the upper layer / surface, the difference is not significant enough to allow chronological differentiation. For both sites, the Black-topped pottery represents two thirds of the Nile silt pottery, leaving the other third for the Red-polished group. This, together with the absence of Rough (Nile C) pottery, corresponds rather well with the Naqada III Period (Hendrickx 2006: 72-73) and fits perfectly with the radiocarbon dates mentioned above.

11. See next note for details.
12. According to De Dapper (per. comm.), the white inclusions may be fragments of saprolite (deeply chemically weathered rock, resulting in kaolinite), which is present in Aswan and also in the Western Desert (Soukiassian et al. 1990: 82). Highly weathered rocks with particles of white kaolinite were observed on the road between Luxor and Douch (De Dapper, per. comm.).
Concerning the stratigraphy, the only chronologically relevant observation to be made is that Marl, Nile C and Nubian sherds occur almost exclusively in the top layer (surface). The first two are characteristic for respectively Petrie’s Late and Rough classes (Petrie 1921) and, together with the Nubian sherds, they certainly represent a second, more recent phase of occupation. Given the highly fragmentary nature of the material, pottery shapes are hard to identify. It is nevertheless possible to identify shape groups for a relevant part of the material (tab. 2).13 The Shale fabric mainly consists of unrestricted shapes, with convex upper parts (USx) (fig. 16.14-16). Nearly all of them are relatively large, deep bowls. There is very little difference between WK14-A and WK15-B. For the Nile silt pottery, there is more variation, although USx shapes are again the most numerous (fig. 16.1-2). However, the domination is far less important for WK14-A, which shows a greater diversity of shapes compared to WK15-B. This does not necessarily have chronological implications but might rather be due to the difference between a cemetery and settlement site. Because pottery related to the production of food is hardly ever included in funerary assemblages (Hendrickx 1994: 94), the selection of vessel types for burials emphasised the differences in the finer quality pottery represented by Black-topped and Nile silt classes, both made of Nile silt. Only a limited number of vessel fragments can be identified with sufficient certainty according to Petrie’s (1921) typology, allowing comparison with pre-World War II excavations, on which the Naqada chronology is still largely based.14 However, among the identified types are several Petrie types that are only exceptionally attested in the Predynastic cemeteries from Upper Egypt and for which the relative chronological position is therefore not well defined. This is especially so for a group of vessels related to Petrie’s type B 83 b (fig. 16.7-9), one of which was found in the intact tomb at WK14-A (fig. 16.7). The few parallels known for this type are from Cemetery 45 at Shem Nishai (Reisner 1910: 259: fig. 212.4), and Adaima settlement 4001/17f (Midant-Reynes & Buchez 2002: fig. 2.5 n° 80). There are, however, two Nubian fabric examples from the surface at WK14-A, one of them is black-mouthed and both have milled rims (fig. 16.26-27), indicating that this type of vessel is rather of Nubian inspiration. The limited number of Black-topped straight-sided cups and bowls (fig. 16.1-2) on one hand, and the importance of beakers (fig. 16.3-5) on the other, seems to exclude the very early Naqada I period (Hendrickx 2006: 74-75) and points to Naqada IC-IIA. The presence of a few modelled rims might allow a date in Naqada II A, but as none of them are lip-rims and considering the complete absence of Rough (Nile C) pottery from Layers 2 and 3, Naqada IC is preferred as date (Hendrickx 2006: 75-76). In this respect, the absence of White Cross-lined pottery is to be noted; however, at least one vessel type (fig. 16.13) is a local imitation of a vessel shape

### Tab. 2

<table>
<thead>
<tr>
<th>Shape</th>
<th>Nile silt</th>
<th>Shale fabric</th>
<th>Nile silt</th>
<th>Shale fabric</th>
</tr>
</thead>
<tbody>
<tr>
<td>USx</td>
<td>30</td>
<td>34,9%</td>
<td>36</td>
<td>83,7%</td>
</tr>
<tr>
<td>USv</td>
<td>23</td>
<td>26,7%</td>
<td>4</td>
<td>9,3%</td>
</tr>
<tr>
<td>Uv</td>
<td>11</td>
<td>12,8%</td>
<td>1</td>
<td>2,3%</td>
</tr>
<tr>
<td>RSx</td>
<td>20</td>
<td>23,3%</td>
<td>2</td>
<td>4,7%</td>
</tr>
<tr>
<td>RNv</td>
<td>2</td>
<td>2,3%</td>
<td>0</td>
<td>0,0%</td>
</tr>
<tr>
<td>Total</td>
<td>86</td>
<td>100,0%</td>
<td>43</td>
<td>100,0%</td>
</tr>
</tbody>
</table>

13. This was done following the principles established by Nordström (1972: 68-74) and Holthoer (1977: 52-54). See also Hendrickx 1994: 39-42. For an application on sherd material, see Hendrickx et al., 2001: 59-76.

14. Fortunately, this is at present changing for the Naqada I-II period thanks to recent work by Nathalie Buchez (2007; 2008) and Rita Hartmann (2008). But for the time being their work is not published in sufficient detail to allow for comparison and integration of the data from Nag el-Qarmila.
characteristic of White Cross-lined pottery (e.g., Petrie 1921: pl. XXI.25,30D).

The Shale tempered pottery is dominated by cooking vessels (cf. infra, tab. 4), for which not a single flat base is attested (fig. 16.14). The few Shale tempered bases that could be identified were found in situ, and other than one exception, all are rounded. Obviously the base fragments cannot be distinguished from wall fragments. Shale tempered round based cooking pots are well known from Adaima (Midant-Reynes & Buchez 2002: 233-235, fig. 2.14; Buchez 2004: 18, fig. 3) and Hierakonpolis (Friedman 1994: 154-155), but seem restricted to southern Upper Egypt, with Gebelein representing its most northern occurrence (Buchez 2004: 17). Large scale presence of Shale tempered cooking vessels is restricted to Naqada IC-IIB at both Hierakonpolis and Adaima (Buchez 2004: 18). The more recent Nile C cooking vessels, characteristic of Naqada IIC (?) onwards (Buchez 2004: 26), are not attested at Nag el-Qarmila. The material from the more recent phase of occupation is limited in quantity, but includes a number of very characteristic Nile C and Marl vessel types (R 81, W 47-49, D 32, D 63 a, L 7 b, L 7 g), dated to Naqada IIC-III A2 (fig. 16.18-22). At the present time, it is impossible to narrow down this rather long period and the possibility of (seasonal?) occupation of the site over several centuries has to be considered. Within the relatively limited range of vessel shapes, six basic functional types can be distinguished (tab. 3). The first two groups are made up of bowls and plates that must have been used for the presentation of food or short term storage. The third group consists of beakers, the larger ones of which would have been used for storage, while the smaller ones may have served as drinking beakers. The fourth group consists of jars, all of them of restricted shape that must have been used for storage, although this is less obvious for the smaller examples. The cooking vessels represent a fifth group. They are confirmed as such by the regularly occurring presence of soot generally on the lower outside of the vessels, but occasionally also inside the vessels. Finally there is a small group of large vats, all of Nile C. On many vessel fragments, traces of use can be observed and none of the vessels seem to have been made exclusively for funerary purposes. This is consistent with the observations made at other Predynastic cemeteries (e.g., Midant-Reynes & Buchez 2002: 464-465; Hendrickx 1994: 50-51).

<table>
<thead>
<tr>
<th>Bowls</th>
<th>Beakers</th>
<th>Jars</th>
<th>Cooking vessels</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>Nile A</td>
<td>61</td>
<td>46.9</td>
<td>51</td>
</tr>
<tr>
<td>Nile B</td>
<td>4</td>
<td>3.1</td>
<td>0</td>
</tr>
<tr>
<td>Nile C</td>
<td>5</td>
<td>3.8</td>
<td>0</td>
</tr>
<tr>
<td>Shale rough</td>
<td>4</td>
<td>3.1</td>
<td>0</td>
</tr>
<tr>
<td>Shale fine</td>
<td>21</td>
<td>16.2</td>
<td>0</td>
</tr>
<tr>
<td>Shale sand</td>
<td>14</td>
<td>10.8</td>
<td>0</td>
</tr>
<tr>
<td>Marl</td>
<td>11</td>
<td>8.5</td>
<td>0</td>
</tr>
<tr>
<td>Nubian</td>
<td>10</td>
<td>7.7</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>130</td>
<td>100.0</td>
<td>51</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bowls</th>
<th>Beakers</th>
<th>Jars</th>
<th>Cooking vessels</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>Nile A</td>
<td>61</td>
<td>46.9</td>
<td>51</td>
</tr>
<tr>
<td>Nile B</td>
<td>4</td>
<td>3.1</td>
<td>0</td>
</tr>
<tr>
<td>Nile C</td>
<td>5</td>
<td>3.8</td>
<td>0</td>
</tr>
<tr>
<td>Shale rough</td>
<td>4</td>
<td>3.1</td>
<td>0</td>
</tr>
<tr>
<td>Shale fine</td>
<td>21</td>
<td>16.2</td>
<td>0</td>
</tr>
<tr>
<td>Shale sand</td>
<td>14</td>
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<td>0</td>
</tr>
<tr>
<td>Marl</td>
<td>11</td>
<td>8.5</td>
<td>0</td>
</tr>
<tr>
<td>Nubian</td>
<td>10</td>
<td>7.7</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>130</td>
<td>100.0</td>
<td>51</td>
</tr>
</tbody>
</table>
About 90% of the fragments identified as individual vessels could be attributed to one of the six functional types (WK14-A: 166/178 i.e., 93.3%; WK15-B: 171/192 i.e., 89.1%). Even without taking the fabrics into consideration, important differences occur between WK14-A and WK15-B (tab. 3). The less important number of cooking vessels and the higher amount of beakers as well as bowls at WK14-A reflects the cemetery character of the site, as was already noticed when discussing the shape diversity.

When the functional types are linked to the fabrics, it is obvious that specific functional types are characteristic for specific fabrics. Beakers are exclusively made of Nile A. For the jars, three fabrics are principally attested. However, the Nile C and Marl examples all belong to the second chronological group and if these would have been left out, the jars would have been strongly dominated by Nile A vessels. The cooking vessels are almost exclusively made of Shale fabrics, which is most logical considering the refractory characteristics of the fabric (Buchez 2004: 17). The only other important group of Shale fabric types is bowls; the majority of them have very deep shapes and only differ from the cooking vessels by their smaller size. It can be supposed that a number of the Shale fabric bowls are in reality small cooking vessels. In this respect it is interesting to notice that the Rough shale fabric is preferred for larger vessels, as is shown by the limited number of bowls compared to the large number of cooking vessels for this fabric.

A more detailed look at the Black-topped and Red-polished pottery shows that the overall functional assemblage is largely identical at both sites (tab. 5), although it was noted previously that there is great diversity in shape at WK14-A (tab. 2). The differences that do occur (Red-polished beakers and jars) can be disregarded because they are based on a few vessels only. The very large majority of the Red-polished pottery consists of bowls. These are far less frequent for Black-topped pottery, which is dominated by beakers. Furthermore, the Black-topped bowls are not very deep in shape (cf. Petrie P 22), while the Black-topped bowls are generally very deep. The latter are therefore related to the beakers and were most probably used for the same purposes. This makes the differences between the Black-topped and Red-polished pottery even more marked.

Together, the Nile silt and Shale fabrics represent over 85% of the identified vessels for both sites at Nag el-Qarmila, although the Shale fabric is conspicuously more important at the settlement site WK15-B compared to the cemetery site WK14-A (tab. 1). The Shale fabric is mainly used for cooking vessels, the high percentage is to be expected for a settlement site and far less likely for a cemetery site. It can therefore not be excluded that part of the material found at WK14-A originates from the nearby settlement site WK15-B or that over time the settlement developed over (part of) the cemetery. However, the latter is contradicted by the supposed simultaneity of the two sites, and by the fact that the Shale tempered pottery is contemporaneous with the Black-topped and Red-polished pottery. Therefore, the Shale tempered pottery might also represent the remains of funerary rituals carried out in the neighbourhood of the tombs, at the time of the burial itself or afterwards. This is unfortunately an unknown aspect of the Predynastic cemeteries, the surface of which has generally been deflated by erosion. A much more recent, 2nd Dynasty example from Elkab shows that

<table>
<thead>
<tr>
<th>Functional types of Black-topped and Red-polished pottery.</th>
</tr>
</thead>
<tbody>
<tr>
<td>WK14-A</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Bowl</td>
</tr>
<tr>
<td>Plate</td>
</tr>
<tr>
<td>Beaker</td>
</tr>
<tr>
<td>Jar</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
large quantities of pottery that were left on the surface in the neighbourhood of tombs can occasionally be preserved if the conditions are favourable (Hendrickx et al. 2002).

The two excavated areas at Nag el-Qarmila are contemporaneous and reflect ceramic assemblages that can respectively be associated with a cemetery and a settlement site of Naqada IC date, eventually continuing into Naqada IIA. The surface material represents another chronological period, dating to Naqada IIC-IIIA2, which is at first view separated by a hiatus from the excavated material. However, as previously discussed, this does not necessarily reflect reality. The Naqada IIB Period is characterised by vessel classes and types that already exist during Naqada IIA or that will continue to be produced during Naqada IIC. Disturbed archaeological contexts such as the surface material from Nag el-Qarmila hardly allow the identification of a Naqada IIB assemblage. This is even more so because the amount of surface material is limited. A continuous use of the site can therefore not be excluded and it even seems likely that the site was (at least seasonally?) occupied from at least Naqada IC up to Naqada IIIA2.

The Lithic material from WK15

The study of lithic material recovered at the site is only at a very preliminary stage. All material (i.e., debitage, tools and cores) has been described in detail and a thorough statistical analysis is ongoing. This paper provides a brief survey of the lithics recovered from the site’s surface and Layers 3 and 11. A final detailed study will not include further observations regarding the surface material as it was determined that the surface had been greatly disturbed by post-depositional processes and possible slope-wash.

Surface collection from Area B

The collection consists of debitage and tools made of flint of various colours and transparency; the most common is the pale brown type, non transparent. Other raw materials, of which there are relatively few, were recorded: namely quartz and agate.

The debitage (fig. 17) includes mostly flakes, although blades are also present. Among the debitage, primary flakes such as cortex/partially cortex flakes, suggest that core cleaning was performed at the site. However, aside from one extremely exhausted specimen that was worked at its end by means of a bipolar technique, no core was recorded among the material. The recovery of crested pieces is another indication that lithic manufacturing was conducted in situ. The flakes, at first glance, are mostly from single platform cores although multi-platform specimens were also noted. The flake’s butts are normally flat with few exceptions of dihedral types. Tools are represented by burins, perforators, a few scrapers, scaled pieces and some lunates. Burins seem by far the most common tools and many burin spalls were also noted. Perforators are normally backed on both sides; some have a broken twisted tip. One example was made on a broken tool with a triangular form. The lunates are quite characteristic as they are made mostly of agate or chalcedony, but it should be noted that debitage of this material is rather scarce and cores are absent.

Layer 3

Time restraints prevented the completion of a detailed description of the material recovered in this layer. The collection is by far more abundant than that of the underlying Layer 11. One may estimate that at least half the material has been described and that this sample may be considered statistically significant for future comprehensive and conclusive examinations. Study of the remainder of the collection is worth completing to under-
stand possible distribution patterns that cannot be revealed at moment. The assemblage from Layer 3 does not differ greatly from that of Layer 11. The main relevant difference is the presence, although scanty, of chert, quartz and agate debitage, not as common in the underlying Layer 11. The assemblage is composed mainly of flakes; blades represent less than 10% of the debitage sample.

Most astonishing is the shortage of cores; of which only two specimens were found. One is a single platform and the other an opposite platform core. Flakes are mostly from single-platform cores; some of them seem connected with bifacial manufacture and a flint axe re-sharpening flake has been recorded among them. The presence of primary flakes, together with partially cortex flakes and few cores would suggest in situ production. Almost all tool categories are represented in this sample with the most common being burins and perforators, followed by scrapers (figs. 17 and 18a, b, c). The number of scaled pieces among the Varia is particularly interesting (fig. 18d). Many flakes showing un-patterned retouch due to their use were also recorded. Together with the many burins are plenty of burin spalls testifying to the importance of these tools. To the naked eye, some of the perforators show considerable use-wear.

Layer 11
Less material was recovered in this layer compared to Layer 3. It is mostly composed of pale brown Egyptian flint with a meagre amount of agate or chert from Nile pebbles. Preservation is rather good but debitage and tools appear very fragmented: a lot of broken flakes and tools were counted. Flakes are not very large but a few exceptions exist (Average length = 22.4mm, Min. = 6.03mm, Max. = 67.92mm). Larger flakes generally preserved at least one third of the original cortex surface. Primary flakes are scarce but also present. A single core specimen was also found in this layer, it is a typical single platform core with a flat platform, cortex on the back. It was used for producing blades; at least as witnessed at the stage it has been abandoned. As a matter of fact, not many blades were counted among the debitage; they represent, as in Layer 3, less than 10% of the debitage sample.

Few quartz flakes, reminiscent of pieces usually retrieved in Nubian assemblages, were found in square A5, Layer 11. One of which is particularly interesting as it has a cortex platform like most quartz material from Central and Northern Sudan. The absence of platform preparation before flake detaching is typical of Neolithic Sudanese industries (Caneva & Zarattini 1983; Kobusiewicz 1996; Usai & Salvatori 2006). Two very small notches are visible on the distal extremity of this flake. The tool sample is very similar to that recorded in Layer 3, with a slight difference in the amount of notches/denticulates and scrapers. Burins, perforators and scaled pieces are other important tool types.

Comment
The lithic samples recovered from the two main layers at Nag el-Qarmila do not differ greatly. Technological and typological aspects of this lithic industry point to an overall continuity in production. The abundance of flakes vs. blades suggests at present, a prevailing flake production orientation. Hard hammer technique and single-platform-core for flake technology seems to prevail, even if blades and a blade-core have been found. The discrepancies between Layer 3 and 11 in tool types may be ascribed, for example, to a shift in the function of that particular area.
or simply to post-depositional disturbance. Needless to say, these discrepancies are worth reconsidering following future excavations. If one excludes the category here called Varia, which includes mainly scaled pieces and fragments of unidentifiable tools, the relevant amount of burins of different types at Nag el-Qarmila echoes a situation recorded in other predynastic sites such as El Abadiya 2 (Vermeersch et al. 2004) or Adaïma (Midant-Reynes & Prost 2002). The second most important tool type is the perforator, with many specimens that present a clear used-wear tip and striae perpendicular to the tool’s axis visible to the naked eye. Perforators are also numerous at Adaïma (Midant-Reynes & Prost 2002: figs. 3.5 and 3.6), although not as much in other Predynastic sites (Vermeersch et al. 2004: 243, table 7). When compared to El Abadiya and Adaïma, what is most remarkable at Nag el-Qarmila is the overall absence of bifacial tools, even if a fragment of a possible biface and a re-sharpening flake were found. Given the very preliminary stage of the current study as well as the necessity to gather more information during future field seasons, it is not possible at this stage to reach conclusions concerning the sample itself and how it may differ with other more or less contemporaneous assemblages. Nevertheless, the presence, however scanty, of Nubian technological practices must be highlighted, the most characteristic being agate/chalcedony lunates (fig. 19) (Usai 2008). Such evidence is worth mentioning as it has not only been attested at Nag el-Qarmila; lunates had furthermore been noted among the inventory coming from Cemetery 17, at Khor Bahan (Reinser 1910)16.

The charcoal analysis17

Wood anatomical research was undertaken on two thirds of the charcoal material that was available for study and on a few finds of desiccated wood recovered from the settlement excavation. The aim of the anthracological study was to provide information on the exploitation of wood for fuel and on the ancient plant cover in the vicinity of the site. The charcoal from some trees and shrubs can be identified to the species level because they have characteristics that differentiate them from other species of the same genus, or they are the only species of the genus present in the respective region; in other cases they can be identified only to the genus or family level. The charcoal material was obtained from domestic fire places as the most important in situ contexts or consisted of fragments dispersed in the occupation levels. The examined material, which was collected by hand selection and through dry sieving, comprises 30 samples with 2,548 pcs (294.5g). The samples also included a few pieces of unidentified wood charcoal as well as bark charcoal. The charcoal remains tend to be of smaller size and more fragile. The pieces were fractured by hand or, more often, already existing breaks were used and the wood structures were observed in the three anatomical planes transversal, tangential-longitudinal and radial-longitudinal using an incident light microscope. The fuel samples that were recovered from the campsites show a more heterogeneous composition. In the majority of the samples 3-6 taxa are contained; in those of small size only 1-2. In total, the anatomical analysis of the charcoal resulted in the identification of 7 tree and shrub species among which Acacia nilotica is the most abundant. It occurs in 43 samples with 1,240 pcs (136g); followed by Acacia sp. (a group of acacias that includes A. raddiana, A. seyal, A. laeta, and others) in 41 samples with 505 pcs (68.6g) and Tamarix sp. in 28 samples (595 pcs, 71.6g). The remaining 4 taxa, Faidherbia albida, which is close to the acacia genus, Ziziphus spina-christi, Capparis decidua and Chenopodiaceae, are represented to a much lesser extent (tab. 6). The

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16. A lunate in agate was also found by Gatto in 2006 during a survey in the location of the cemetery of Kubbania South.
17. Rainer Gerisch, Free University Berlin.
The largest quantity of charcoal was analyzed from Hearth 6: 720 pcs (116.5g). From Hearth 7 in Layer 12, Feature 2, 358 pcs (39g) were examined and from Hearth 8 associated with Layer 15, 258 pieces (24g). The assemblages obtained from these hearths consist predominantly of acacia and tamarisk charcoal and to a smaller extent of charcoal from the other taxa (tab. 7).

The identified taxa represent the natural woody vegetation of the floodplain and the adjacent desert land. *Acacia nilotica*, *Acacia* sp. (*A. laeta*, *A. seyal*) *Faidherbia albida*, and *Tamarix nilotica* were growing along the Nile; towards the desert and in the wadi beds, *Acacia raddiana*, *Tamarix aphylla*, *Capparis decidua*, *Ziziphus spina-christi* and shrubs of the Chenopodiaceae family were found. These riverine and desert plants still grow in Upper Egypt today, but some species are reduced to a few stands. The Nile acacia trees are distributed mainly along the Nile valley and the oases and can be seen along roads and canals. *Acacia raddiana* grows throughout Egyptian deserts in wadis and depressions. On islands of the First Cataract, which are covered by vegetation of semi-natural character, the tree is found in the elevated central parts together with *Ziziphus spina-christi* while other acacias are distributed on the lower parts closer to the water (Springuel 1981). The water-loving *A. laeta*, *A. seyal*, and *Faidherbia albida* are still present in very few locations because the fertile soils in the Nile valley have been cultivated and habitats have been lost (Springuel 2006).

The assemblages primarily reflect an abundance of acacia trees. They were also favoured as they provide an excellent fuel with a high calorific value. Tamarisks were the other main source of wood fuel with good burning properties, although they burn more quickly and with more smoke in comparison to acacia trees. Good comparisons with the present results are the studies of Kroll (1989) on Maadi, and Newton (2005), who identified charcoal from the Predynastic sites at Adaïma and Elkab, Pernaud (2002) on Adaïma and studies by Fahmy on the Predynastic Hierakonpolis (e.g. Fahmy 2003).

<table>
<thead>
<tr>
<th>Taxa</th>
<th>Hearth 6</th>
<th>Hearth 7</th>
<th>Hearth 8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pcs</td>
<td>g</td>
<td>pcs</td>
</tr>
<tr>
<td>Acacia nilotica-type</td>
<td>240</td>
<td>41.0</td>
<td>262</td>
</tr>
<tr>
<td>Acacia sp.</td>
<td>125</td>
<td>26.5</td>
<td>50</td>
</tr>
<tr>
<td>Capparis decidua</td>
<td>5</td>
<td>0.5</td>
<td>4</td>
</tr>
<tr>
<td>Chenopodiaceae</td>
<td>10</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>Faidherbia albida</td>
<td>10</td>
<td>1.0</td>
<td>12</td>
</tr>
<tr>
<td>Tamarix sp</td>
<td>330</td>
<td>46.5</td>
<td>26</td>
</tr>
<tr>
<td>Ziziphus spina-christi</td>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
</tbody>
</table>

**Tab. 7**

Comparison of charcoal composition of the three hearths.

**Acknowledgments**

For permission to work, the project is very grateful to Dr. Zahi Hawass, Secretary-General of the Supreme Council of Antiquities of Egypt, and his colleagues on the Permanent Committee of the SCA.

Much appreciated is also the great help received by Dr. Mohamed El Bialy, Director-General of the Aswan Inspectorate. A special thank you goes to Dietrich Raue and the German Mission at Elephantine for their help in the field. Thanks also to UNESCO Cairo Office for support and help.

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