REPORT TO

THE SUPREME COUNCIL OF ANTIQUITIES

ON THE 2005–2006 SEASON ACTIVITIES

OF THE DAKHLEH OASIS PROJECT

By

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ENVIRONMENTAL STUDIES

Geological Investigations

Dr. Jennifer R. Smith, with Dr. Bonnie Blackwell, Johanna Kieniewicz, Katherine Adelsberger report as follows:

Much of the brief time we spent in Dakhleh this year (9 days of field work) was spent mapping in localities discovered by M. R. Kleindienst and C. S. Churcher using differential GPS (DGPS). Differential GPS can be accurate to within 10 centimetres both horizontally and vertically, though vertical accuracy is typically 20–30 cm. The use of differential GPS allows for the comparison of the elevations of locations around the oasis. We focused principally on recording elevations of locations related to either (or both) Pleistocene lacustrine sediments (hereafter CSS), or Dakhleh glass. Thus, most of our work consisted of gathering point data on particular outcrops or localities. One attempt was made to systematically map the topography of the Dakhleh Bow Wave Structure (described by Kleindienst and Churcher), but due to difficulties with the power supply for the DGPS, the bulk of that data was lost.

We investigated several places where the Dakhleh Glass could be found in situ within the CSS, as well as several other locations (e.g., Sarcophagus Hill, Iron Balls Spring) where the Dakhleh Glass occurs at the surface. We spent some time examining the ‘carbonatite’, a carbonate which, based on prior work by Schwarcz, has an igneous rather than sedimentary texture. As best as we could tell from our field examinations, this carbonate did not appear to be volcanic in nature. No ‘neck’ or feeder dike could be observed; rather the fused carbonate appears to record the \textit{in situ} melting of the CSS which immediately underlies it. We dug two trenches to establish the stratigraphic context of the ‘fused carbonate’; the contact between this carbonate and the underlying CSS was not sharp, rather gradational. Subsequent examination of ‘calichified’ layers in CSS outcrops indicated a distinct similarity in macro-scale texture to the fused carbonate. It is likely, then, that the fused carbonate represents additional evidence of the thermal pulse which produced the Dakhleh glass, though it is unclear at this time what implications this fused carbonate has for the nature of the event which presumably produced both materials.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure1.png}
\caption{Tufa deposits near Balat point.}
\end{figure}
Finally, we also attempted to map additional lacustrine and spring deposits where possible. One day was spent evaluating the extent of the tufa terraces near Balat Point discovered some years ago by Kleindienst and Churcher (Figure 1). These appear to be the most extensive in situ tufas yet known from Dakhleh. It appears as though at least 3 different episodes of tufa deposition are recorded by these deposits. Tufa facies are similar to those found elsewhere in Dakhleh and in Kharga Oasis; vertically-laminated barrage dam deposits are present, as are plant-cast rich framework tufas. The tufas extend (discontinuously) ~1.2 km down a pediment surface from just below the base of the Tarawan limestone. No in-situ archaeological material was discovered within the tufa, though material was present at this surface in the vicinity of the deposits. It appears as though at Balat, as in the regions of ‘escarpment veneer’ or ‘perched springline’ tufas described from Kharga (Bulaq and Abu Sighawal in particular), higher elevation tufa sheets are older than lower elevation sheets, with incision dominating between episodes of tufa deposition. This hypothesis, however, is based only on a macroscopic assessment of tufa alteration; the higher tufa sheets appeared more re-crystallized with fewer primary structures than the lower ones.

In addition, Johanna M. Kieniewicz reports on other activities as follows:

This year, my work focused on two discrete projects: 1) to continue my research from last year into the characteristics of the Mid-Pleistocene ‘CSS’ sediments; 2) to work with Albert Haldemann in characterizing the occurrences of Dakhleh Glass.

In addition, Johanna M. Kieniewicz reports on other activities as follows:

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Dakhleh Paleolake Investigations
The CSS (or calcareous silty sediments) have been studied by project members M. R. Kleindienst and C. S. Churcher from the archaeological and zoological perspectives, respectively. My interest lies in understanding specifically, the paleoenvironments represented by the sediments, and the climatic implications that can be thereby derived, and their respective implications for the habitats for the early human occupants of Dakhleh Oasis. As Early Middle Stone Age artifacts have been found in association with this unit (and in situ), an improved understanding the paleoenvironment in which the early inhabitants of the oasis lived is important from the perspective of constraining available water resources, and the habitability of the Sahara at that time. Specifically, my efforts were focused on the Teneida Basin area, where our survey of lake sediments was not completed last year (Figure 2). Differential GPS (DGPS) measurements were taken for numerous outcrops, and their stratigraphy was described. The basal lake sediment unit for the Teneida basin comprises a fine grained mud, which varies in thickness across the basin. The lake sediments were observed in areas to horizontally abut Taref sandstone yardangs, as well as acting as caps (as can be observed in the outcrops along the main road out of the oasis to the east). This indicates that the lake surface was likely uneven as it
is today – the large sandstone yardangs in the Eastern portion of the Oasis were likely eroded to near their present levels, and acted as isolated shallow areas of the lake.

Other related work regarding the extent and sedimentology of the paleolakes involved a trip to (and DGPS measurement on) cobble beach deposits observed in the past by R. Churcher, sedimentological work on deposits in Gedida, south of Mut, and south of Balat. We also investigated tufa deposits along the Libyan Plateau escarpment, as they may provide evidence for overland flow of carbonate-rich water into the Dakhleh lakes. Alkalinity measurements were also made at wells in Qasr, Mut, Sheikh Wali, and Bashendi. Constraints upon the carbonate content of the Nubian Aquifer water, which may have helped to maintain the large paleolakes present in Dakhleh Oasis during the mid-Pleistocene.

Dakhleh Glass Investigations

I also worked with Dr. A. Haldemann from the Jet Propulsion Laboratory in an effort towards the characterization of the taphonomy of the Dakhleh Glass. Dakhleh glass is a dark green to black vesicular Ca-Al-silicate glass, with many characteristics of impact-related glasses. Understanding its formation is of interest to us, as it represents a possible lacustrine impact (thus far unknown on Earth) at a period of significance in human history. Furthermore, understanding this event and its consequences will further our efforts towards Pleistocene landscape reconstruction of Dakhleh Oasis. Our goals for the season involved placing constraints upon the extent and distribution of the glass in an effort towards defining a mechanism for its deposition, as no readily apparent crater is present. Our activities with this regard involved mapping Dakhleh Glass localities noted by Kleindienst and Churcher, mapping the Dakhleh Bow Wave Structure (a feature west of Teneida noted by Kleindienst as a possible impact-related feature). We also made a step-trench in the upper part of ‘Cone Hill’, a CSS deposit with in situ Dakhleh Glass, for the purposes of understanding its setting in situ and possible deposition mechanisms, and understanding the origin of the multiple layers of glass within the outcrop itself. In the following paragraphs I will discuss our findings, thus far.

![Figure 3](image.png) Typical surface lag of Dakhleh Glass (dark splotches in foreground).

The glass primarily occurs as a surface lag on CSS surfaces, as a lag on the ground associated with CSS (Figure 3). We tentatively interpret this to mean that it was deposited within the lake/marsh sediments. Indeed, it commonly contains vegetation casts. The glass was then deflated to its present location, being more resistant than the overlying CSS sediments. One mystery that remains, however, is why its distribution is not more continuous than is observed. It seems to occur (with perhaps the exception of the Kellis Deposits) as isolated deposits. Excellent examples of this are the ‘splotas’ to the south of the DBWS. If the formation event was actually an impact, rather than an airburst, the distribution of glass may have been less regular than would have resulted from a more uniform super-heating of the surface.
Our other study primarily involves the trench dug at ‘Cone Hill’ to understand the record of the sediments surrounding the in situ Dakhleh Glass (Figure 4). At Cone Hill, and the deposits surrounding that gebel, the glass occurs in multiple layers, leaving open the suggestion that the glass-forming event either occurred twice, or that the sediments were reworked to their present state. Our observations suggest that the latter is the more likely scenario. Lenses of discontinuous sediment are common, and root traces are virtually absent from the Dakhleh Glass-containing section, whereas they are common below. Furthermore, charcoal occurs sporadically throughout the section, as do lenses of a varicoloured (from red to purple) friable silt, which seems to be exclusively associated with the Dakhleh Glass. These observations seem to suggest that reworking of the sediments (by wave action, sloshing around, etc) occurred subsequent to the deposition of the first layer of Dakhleh Glass.

Impact Geology

A short report from Albert F. C. Haldemann follows:

Impact Geology and Remote Sensing

I had two objectives for this, brief field season in Dakhleh:

1. To complete a personal reconnaissance of ‘Dakhleh Glass’ (DG) locations, and to familiarize myself with the regional geology so as to understand the setting of the DG. The DG, is by no means fully understood, but is clearly related to the Dakhleh Oasis Palaeolake deposits. Furthermore, an origin related to meteoritic impact of this Ca-Al-Si glass now seems not only plausible, but likely. One goal within this objective was to find further evidence for DG in-situ within the Palaeolake sediments. Another goal of this objective was to evaluate the potential of remote sensing data to be used for the DG study.

2. To investigate in detail the ‘Carbonatite Mound’ to attempt to determine its geologic significance. The exotic analysis of this feature might suggest a volcanic origin, which would be the only volcanic rock at Dakhleh. In the
context of objective 1, this is another anomalous geologic feature at Dakhleh, and it might be related to the DG-forming event.

I conducted my fieldwork in collaboration with Professor J. R. Smith, J. M. Kieniewicz, K. A. Adelsberger, Professor M. R. Kleindienst, and Professor and Bee Churcher from 9th–18th January. Prof. Kleindienst and Prof. Churcher are the original discoverers of the DG, which was first found in 1987, and then identified by H. P. Schwarcz as a natural glass in 1992.

A brief time-ordered summary of my field reconnaissance, including the localities visited follows [with Loc. Numbers from Prof. Kleindienst]:

[9/1/2006] The ‘Dakhleh Bow Wave Structure’ (DBWS, Loc. 418). The DBWS is a synclinal structure that comprises the most deformed sediments that I observed anywhere in Dakhleh. It is an open question as to whether the structural deformation is only due to regional faulting, or is somehow also related to the process that formed the DG. We also briefly visited ‘Iron Balls Spring Vent’ (Loc. 374).

[10/1/2006] ‘Carbonatite Mound’ (Loc 292), and the Taref Fm. sandstone southwest of Sheikh Muftah Valley fault trough. The isolated gebel was dubbed ‘Carbonatite Mound’ because the rock appears thermally altered. Our investigations on this day suggested that the altered rock in fact overlies lakebed sediments below. If confirmed, this discovery widens the areal evidence of the Paleolake.

We briefly visited the ‘Salt Pan’ area southeast of Ezbet Ein Shams, which is a potential cratered area.

[11/1/2006] ‘South Ridge Gebel’ (Loc 437) in the area south of Sheikh Wali. The discovery of DG on and among gebels south of Sheikh Wali was made only several days earlier by Prof. Smith. We charted a DG lag on the desert pavement south of the limit of cultivation.

The High Section (Loc. 397 Central) and ‘Cone Gebel’ (Loc. 397 West) south of Masara, where DG is found in situ within the Lake Kellis Fm deposits.


[13/1/2006] ‘Sarcophagus Gebel’ (Loc. 435) where MSA and DG were previously found associated with the Lake Balat Fm. ‘Glass Knoll’ (Loc. 390, Occurrence 2) where DG was first noted in 1998. The spread of DG was found to extend north and east of the original DG-lag capped knoll.

[14/1/2006] Loc. 357 area east of ‘Camel Thorn Basin’ where a deep section of Lake Teneida Fm. deposits are exposed, and fossils have been found, but where no DG is found. ‘CSS Terrace’ (Loc. 211) and ‘Iron Balls Spring Vent’ (Loc. 374), further east, where DG and MSA artifacts occur in association with the Lake Teneida Fm.

[15/1/2006] Return to ‘Cone Gebel’ for trenching and stratigraphic evaluation with J. Kieniewicz. Observed massive (40 cm) pieces of DG are lagged on a nearby gebel to the southeast: ‘Slab Gebel’ (Loc. 397 East), discovered by Prof. Kleindienst on the 1st November.

[16/1/2006] Returned to ‘Cone Gebel’ with entire team to discuss the sections and DG locales. Returned to Ein Shams ‘Salt Pan’ area for a wider walking survey. Noted significant salt-weathering of the Taref Fm. sandstones. Visited areas north of El-Akoulah (Locs. 366-wadi and 438-wadi), where mounds of ‘displaced’ Cretaceous Duwi Fm. had been noted in 1996, resting directly on Taref Fm. sandstones, and out of normal stratigraphic order. Revisited 418 and did a second reconnaissance of the DBWS synclinal structure and an apparent circular feature masked by Pleistocene gravels.

[17/1/2006] Visited Loc. 006 south of Maohoub. The Roman well-head mounds appear to sample down into the Paleolake sediments and fossil artesian vents. This may help characterize the Lake Kellis Fm. sediments where they may not have been affected by the DG-forming event. Visited ‘Four Knolls Gebel’ (Loc. 432) where Prof. Churcher found Pleistocene artefacts and fauna in 2005, associated with the Lake Kellis Fm.; no DG was apparent.

On 18th–19th January I photographically documented and catalogued the DG samples that the team acquired, and prepared them for storage at the DOP Dig House for future study.

The outcome of this field season, relative to my initial objectives is very satisfactory: I completed a reconnaissance of known DG locations and learned the rudiments of the regional geology with Profs. Kleindienst, Churcher and Smith. With Prof. Smith and J. Kieniewicz, I documented the relationship of the altered carbonate rocks at Loc. 292 to underlying sediments, confirming that the ‘carbonatite’ mound is not of volcanic origin.

My brief field observations will provide a basis for future studies concerning the origin of DG.

Palaeontology and Zoology

Professor C. S. Churcher has submitted the following report on his palaeological and zoological activities:

My field season in Dakhleh Oasis was from 3rd January, 2006. My wife Bee accompanied me as my field assistant for photography and GPS readings, etc. We cooperated with Dr. Jennifer Smith, Dr. M. McDonald and Dr. M. R. Kleindienst for much of the time in Dakhleh Oasis. Dr. Bonnie Blackwell was in both Dakhleh and Kharga Oases from Jan. 16th to 25th to collect freshwater snail shells on which to perform dating analyses.
'Ain el-Gazzareen – Old Kingdom Fauna
A series of 16 faunal samples from the surface of this Old Kingdom site was analysed for faunal diversity and occurrences. Cattle (Bos taurus), goat (Capra hircus) and Dorcas gazelle (Gazella dorcas) were the commonest large mammals, with the minimum numbers of individuals (MNIs) somewhat inversely proportional to the taxon’s bone weight. – [numbers and weight of bone fragments (13, 25 & 9 and 1.465, 1.590 and 0.080 kg for the three major food animals, respectively). Birds recorded: – duck (Anas platyrhynchos) – 2, small birds – ?2, ostrich (Struthio camelus) egg shell, both beads and fragments, and others – rabbit (Oryctolagus cuniculus) – 3, donkey (Equus [Asinus] asinus) – 1, small dog or red fox (Canis familiaris or Vulpes vulpes) – 1, fish vertebrae (? Clarias sp.), Nile oyster ( Etheria elliptica) – 1, apple snail (Pila ovata) – 2, turrett snail (Melanoides tuberculata) – 13. Modern animals were represented by snake vertebrae and gerbil and housemouse skeletal elements.

Only one awl from a Dorcas gazelle tibia and a used piece of rib were recovered. The Nile oyster shell showed no signs of wear but was damaged.

The five shrew right dentaries found in the owl pellet sample recovered in 2005 are identified as the Egyptian dwarf shrew, Crocidura religiosa,

Mut el-Kharab – Surface Collection covering all ages’ Fauna
A series of 114 faunal samples from the surface of this site which spans from the Old Kingdom/Neolithic to modern times was analysed for faunal diversity and occurrences. Cattle (Bos taurus), pig (Sus scrofa), goat (Capra hircus), donkey (Equus asinus) and Dorcas gazelle (Gazella dorcas) were the commonest large mammals, with a sparser representation of camel (Camelus dromedarius), horse (Equus caballus), sheep (Ovis aries), dog or fox (Canis familiaris or Vulpes vulpes), desert fox or fennec (Fennecus zerda), cat (Felis catus), rabbit (Oryctolagus cuniculus) and bubal hartebeest (Alcelaphus buselaphus). Birds recorded: - goose (Anser anser), turkey (Melagris sp.), duck (Anas platyrhynchos), ostrich (Struthio camelus) but no egg shell, pigeon (Columba livia), chicken (Gallus gallus), and various unidentified small birds. Fish vertebrae (? Clarias sp.) and a smaller fish, Nile oyster ( Etheria elliptica), apple snail (Pila ovata), turrett snail (Melanoides tuberculata). Modern animals were represented by the commensals rat (Rattus alexandrinus) and housemouse (Mus musculus amoensis).

The occurrence of a sheep horncore is noteworthy as it is the first sheep record from the oasis’ deposits. However, it is modern in preservation and therefore probably recent. It has a depression for the upper end of a bow-drill and thus may only be as old as 20th Century.

Horse is represented mainly by a smashed skull with dentition of a large, robust animal that was not butchered and may have died from disease or accident.

Butchering was mainly by maul although cutting by saws, cleavers or axes was present.

Because the sample is from a surface collection little reliance should be placed on any attempts to estimate the numbers of individuals of any of these taxa, e.g., only one adult camel probably produced all five instances of camel and similarly only one dog or fox produced the five instances of small dog or fox.

Asteroid Research
The project was fortunate to have Dr. Albert Haldemann of NASA visit it and to cooperate with Drs. Smith, Kleindienst and myself in investigating the spread of Dakhleh Glass (DG), its stratigraphic occurrences, and the Dakhleh Bow Wave Structure (DBWS), the possible hidden craters, etc.

We showed Dr. Haldemann the structures and spreads of DG and found new ones, including one to the west at Loc. 006 (D2-2). Dr. Haldemann agreed with us that the DG was in place in the CSS unit.

This enlarged spread of DG requires a major impact to produce so much molten DG, and Dr. Haldemann suggested that, beside the virtual crater revealed by GPR to the NE of DBWS, there might be other craters. One might lie hidden beneath the salt pan SE of Ezbet Ain Shams, which we have provisionally termed ‘Sun Crater’ or ‘Shams Crater’.

Palaeolake Research
A visit to an assumed carbonatite outcrop east of the airport and south of Sheikh Wali in the south desert showed it to be a heat altered CSS outlier. This indicates that the lake extended south of the oasis by as much as another 5 km.

During the course of visits to various sites I collected some specimens from the Duwi Fm. near Tufa Wadi (turtle shell and a dinosaur vertebra), and NE of DBWS (turtle shell, Enchodus fangs, and a shattered osteoderm, possibly from Spinosaurus). Visits to Snail Hill (Loc. 348) and to Bir Talata al Maohoub (Loc. 006) yielded ungulate foot bones. Visits to the Iron Balls area (Loc. 374) produced equid and at present unidentified specimens. One equid specimen is
too small for the usual large zebra (*Equus capensis*) and appears to be from the common quagga or Burchell zebra (*Equus quagga*), which is an addition to the Iron Balls fauna.

**Botany and Archaeobotany**

Dr. Johannes Walter reports on his work at Amhida as follows:

During this season, archaeobotanical samples from three areas of the site were analyzed, Areas 1.3, 2.1, and 4.1.

A total of 32 matrix samples were taken. Of these, 22 came from Area 1.3, including some samples from the 2005 season, 8 from Area 2.1, and 2 from Area 4.1. These show a similar plant assemblage to that found last year. Because of the better preservation and lower humidity in Area 1.3, a higher percentage of desiccated plant remains and a greater variety of plant species are found in Area 1.3 compared with Area 2.1.

The cereals include bread wheat, hard wheat, and barley. Emmer wheat was found in high quantities only in the temple area 4.1. The woody garden plants are represented by the common species: grape, olive tree, date palm, fig, and rarely peach. Several field crops and herbal garden plants, such as lentil, flax, cotton, safflower, coriander, rosemary, and black cumin occur in the samples. Weeds are represented by grasses, members of the pea family, such as clover, vetch, medick, along with mustard, asphodel, mallow, marigold, sea-blites, sea club-rush, and nettle-leaved goosefoot. Acacia and tamarisk occur in most of the samples. Dung was also found in some samples, occasionally in high concentrations.

![Figure 5: Dakhleh Oasis Region, showing main topographic features, towns and roads. Dune streaks stippled. Bold numbers indicate locations of Archaeological Localities revisited and/or designated in 2006 field season.](image)

**ARCHAEOLOGICAL STUDIES**

**Pleistocene Prehistory**

Professor Maxine R. Kleindienst reports on Pleistocene Archaeology and Geoarchaeology as follows:

I arrived in Dakhleh Oasis, 'Ain el-Gindi, Sheikh Wali, on the afternoon of 23rd December, 2005, and departed on the morning of 8th February, 2006. Work in Dakhleh occupied 34 days.

The goal for this season was to test the models for Middle Pleistocene landscapes and events developed over the past 20 years (Kleindienst *et al.*, n.d.; Churcher and Kleindienst, n.d.). Therefore fieldwork was mainly oriented toward geoarchaeology this season (Figure 5).
I. From December 24, 2005 to January 02, 2006, I worked in the laboratory, processing and reviewing material collected in previous seasons, and concentrating upon collections related to the palaeolake deposits in the (western) Kellis and the (eastern) Teneida Palaeobasins (Churcher and Kleindienst, n.d.). I verified the consistency in finds related to the lake basins, that: 1) aeolized and/or abraded Terminal Earlier Stone Age (ESA) (Balat Unit and/or Upper Acheulian sensu stricto) artefacts predate the lake deposits in several localities; 2) Middle Stone Age (MSA) artefacts in fresh, even mint, condition occur in association with the lake deposits. These had occasionally been found in situ in lacustrine sediments of the Lake Kellis Formation (Fm), the Lake Balat Fm., or the Lake Teneida Fm.

II. Upon returning from Kharga on 5th January, 2006, I conducted fieldwork in collaboration with Professor J. R. Smith, J. M. Kieniewicz and K. A. Adelsberger, with Professor and Bee. Churcher, and from 9th–18th January with Dr. A. F. C. Haldemann.

A. Fieldwork concentrated upon establishing the relationship of the still enigmatic ‘Dakhleh Glass’ (DG) to the Palaeolake deposits – in particular, investigating the possible meteoritic impact origin for the Ca-Al-Si glass (first noted in 1987; and identified as a natural glass in 1992). This required revisiting a number of localities previously identified by me and/or Prof. Churcher, sometimes several times as new problems were identified.

B. Localities [Loc (s)] of particular interest were (Figure 1):

1) ‘Catfish Gebel’ (Loc.434) where old, weathered probable ESA artefacts were found on the Tawil Anticline.
2) ‘Sarcophagus Gebel’ (Loc 435) where MSA and DG were found associated with the Lake Balat Fm.
3) ‘Carbonatite Mound’ (Loc 292), where the abraded MSA lagged in the area had provided a puzzle for the Pleistocene archaeologists since 1995.
4) Locs. 397 and 398, where DG is found in situ within the Lake Kellis Fm deposits, and MSA artefacts are found in association with the lakebeds.
5) ‘Cobble Gebel’ (Loc. 417), where lacustrine beach cobbles representing a shoreline of Palaeolake Kellis were found on top of an isolated stack-gebel in 2004 (Figure 6).
6) ‘Glass Knoll’ (Loc 390, Archaeological Occurrence 2) where DG was noted in 1998, and Terminal ESA bifaces and cores were found, apparently lagged on the pre-lake, contact surface underlying the Lake Balat Fm.
7) The Locs. 356/357 area east of ‘Camel Thorn Basin’ where a deep section of Lake Teneida Fm. deposits has yielded a number of fossils, and a few related artefact finds.

Figure 6 ‘Cobble Gebel’, Loc. 417, looking north-east. Project members investigating deposit of beach cobbles representing an ancient shoreline of Palaeolake Kellis, preserved on top of elevated stack-gebel in the sandsheet south of the modern oasis’ rim.
8) ‘CSS Terrace’ (Loc 211) and ‘Iron Balls Spring Vent’ (Loc. 374) where DG and MSA artefacts occur in association with the Lake Teneida Fm.

9) Locs. 366-wadi and 438-wadi, north of El-Akoulah Pan, where mounds of ‘displaced’ Cretaceous Duwi Fm. had been noted in 1996, resting directly on Taref Fm. sandstones, and out of normal stratigraphic order.

10) The ‘Dakhleh Bow Wave Structure’ (DBWS, Loc. 418), where later Late Pleistocene, small-sized MSA material is found on the eroded surface of Pleistocene P-III gravels, overlying a possible meteoritic impact structure.

11) ‘Four Knolls Gebel’ (Loc 432) where Prof. Churcher found Pleistocene artefacts and fauna in 2005, associated with the Lake Kellis Fm.

C. New finds of Pleistocene artefacts from these known localities reinforced earlier observations that Terminal ESA is associated with the old, pre-lake geomorphic surface, while Middle Pleistocene types of MSA artefacts are associated with the existence of the palaeolakes. Finds at new localities provided further confirmation for this association. The ESA artefacts on the old land surface are much weathered and/or worn, and can be found in any location beneath the lakebeds, even well out into the lake basins. The MSA artefacts, whether in the deposits or on their surface, are in mint to fresh condition and lack desert varnish, showing that they have only recently been exposed. Some may have been water-transported into the lakes, but others appear to be related to old lake shorelines and to fossil artesian vents that erupted along those.

Figure 7  Large Levallois flake found in situ within the basal unit of the Lake Kellis Formation sediments at Loc. 397 East, ‘Slab Gebel’. Top: Bee Churcher examining the find (arrow), showing CSS marls overlying the basal unit; Middle: the flake as found, and as then exposed in the ferruginized sandy deposit; Bottom: close views of the dorsal and ventral faces. The flake measures 88 x 81 x 20 mm; Tarawan chert, mint condition, light coloured patina.
1) We found a diagnostic, large MSA Levallois flake in mint condition within the basal Lake Kellis Fm. deposits at Loc 397-East (‘Slab Gebel’), several metres below lagged DG on the surface of the deposits or the level where DG has been found in situ (Figure 7). This again confirms the hypothesis that whatever caused the ‘heating event’ that created slabs of DG up to 15 cm thick, it likely affected an inhabited oasis area.

2) Geological investigations at Loc. 292 showed that while the caprock of the elevated and isolated mound on the eastern rim of ‘Big Pan’ is not ‘normal’ calcrete, the underlying sediments are lake deposits. This extends a bay of Palaeolake Kellis / Balat some 8-10 km southward. This finding also clarifies the status of the lagged and abraded Pleistocene MSA archaeological remains, indicating that these were probably related to the ancient lakeshores.

3) Similarly, the new work at Loc 390, Occ. 2 located evidence of DG in situ within Lake Balat Fm deposits. A newly discovered blowout (Loc 390, Occ. 3) at the Lake Balat Fm. / bedrock Mut Fm. contact confirmed that abraded Terminal ESA does lie on the old, pre-lake land surface.

4) At Loc. 432, north of Munshiya, an equivalent Lake Kellis Fm. / bedrock Mut Fm. contact surface, also yielded 2 small, worn and weathered ESA bifaces. This area would have been far from the palaeolake shores.

5) In searching for evidence of a possible impact crater southeast of Ezbet Ein Shams, south of the roughly circular ‘Salt Pan’ area, we discovered a small remnant of basal Lake Teneida Fm. sediments (Loc. 436), the furthest west we have yet located. Once again, the surrounding extremely weathered Taref Fm. sandstone surface, representing the old land contact surface, yielded worn ESA artefacts in an area that would have been in the centre of the palaeolake basin (Figure 8). (The Pleistocene prehistorians had not previously surveyed this area of Taref sandstone yardangs.)

6) Through the combined efforts of the group, a number of new MSA artefact finds were added to the aggregates from Locs. 356, 211, 374 and 418.

III. While I obtained additional Pleistocene archaeological material from a number of known, and newly discovered, localities, the goal was to refine the 2004 models, and to better understand the evolution of the Middle Pleistocene landscape as it related to human usages.
The consistency of findings across the (ancient/palaeo-) oasis emphasizes the fact that the settings for human occupations were vastly different from modern times. Artesian spring vents in the Lowland and tufa deposits on the Escarpment (cf. Loc. 399-Flatiron) filled large lakes that probably joined into one lake at times (Churcher and Kleindienst n.d.). This wide body of water – or in a drier times, a broad marsh area – limited access to the lithic and other resources of the northern Piedmont, Escarpment and Plateau top. The factor of limited accessibility is reflected in the nature of the Middle Pleistocene MSA artefacts found in the southern areas of the palaeo-oasis: most artefacts are small-sized; efforts were made to use the available local materials (Mut chert, ironstone, siliceous sandstone or quartzites) which are found in small packages, rather than mainly using the preferred Tarawan cherts (Hawkins and Kleindienst 2003); some imported Tarawan chert flakes are of relatively large size, but Tarawan chert cores are rare and ‘worked out’. All these traits suggest intensive conservation of the preferred raw material, whose sources would have been on the ‘other side of the lake’.

However, much more detailed collaborative investigation is still needed to understand the complex, interwoven human/environmental interactions. Finally, although we cannot yet say definitively what event produced the widely distributed Dakhleh Glass, we are convinced that some catastrophic event took place, which would have greatly affected the lives of Middle Stone Age humans, and all other life, in the Dakhleh region (see reports by Smith, Haldemann).

IV. Another locality revisited (Figure 5) was Loc. 006, where two decades of aeolian erosion have sufficiently deflated old Historic Period wellheads to show that they were sited on fossil artesian spring vents. This choice of well locations by the ‘Roman’ hydraulic engineers has been noted in the past [e.g., Loc. 007 where Acheulian artefacts were included in their backdirt (Kleindienst 1999: 96-97)]. At Loc. 006, the deflated wellhead dredgeate yielded both Early Holocene Masara Unit and Late Pleistocene Dakhleh Unit (Aterian Complex) artefacts. One Dakhleh Unit bipoint was recycled, suggesting that the Holocene peoples in this area had obtained their ‘Holoported’ (recycled) Pleistocene artefacts from the old vents. Few Pleistocene artefacts have come from the area, except in association with Holocene aggregates. The old vents also yield round balls and irregular masses of metallic ‘bog iron’.

We attempted to relocate Loc. 320 (Aterian Complex, Dakhleh Unit) and Loc. 301 (mid-Holocene slab structures), west of Gebel Edmonstone, without success. The area is now much more sanded than it was in 1992, and it appears that the Holocene settlement, Loc. 301, may now be entirely masked by aeolian sediments.

V. Other new localities designated (Figure 5):

A. Locality 437 was designated for the area south of Sheikh Wali with large knolls of spring vents capped by lake deposits carrying DG on the surface, and for the redeposited DG on the surface of the Holocene pan sediments below. No Pleistocene artefacts have yet been found associated with these Lake Kellis Fm. lakebeds; however, the area would have been in the centre of the palaeolake. Further survey is required here. In the Holocene pan area, Sheikh Muftah Unit artefacts are now uncovered in blowouts.

B. Locality 439 was designated for the Pleistocene P-II geomorphic surface in the DBWS area. A few later Late Pleistocene artefacts were found on this surface in 2006, suggesting that planation of the P-II gravels in the area probably occurred during Late Pleistocene dry periods.

VI. Other geoarchaeological investigations:

A. For Mills and Zielinski, I relocated the Roman quarry south of Ezbet Sheikh Mabrouk that M. F. Wiseman and I discovered in 1995.

B. A burning episode that occurred after abandonment of the Temple of ‘Ain Birbiyeh is under investigation. An unusual glass melt related to that burning will provide interesting comparisons for DG.

C. Recording of lithic resources continued. Blocks of silicified Variegated Shales (upper Mut Fm. member), and other silicified rocks from the Duwi Fm., were noted in the Loc. 399-wadi. One extremely stormy day was spent in investigating the distribution and density of MSA artefacts on the P-III terraces flanking the wadi.

D. Bee Churcher and I discovered a probable Old Kingdom Lookout site on a sandstone yardang in the quarried area south of Sheikh Wali, with slab structures, and petroglyphs; DOP grid number 32/420 K2-1. During a subsequent visit, L. Mills noted sherdage as well.

Acknowledgements

My thanks to all the aforementioned colleagues for their sharp eyes and consequent contributions to the Pleistocene archaeological database. Special thanks to Leslie and Tony Mills for their usual extraordinary camp organization; and to the camp staff for their always cheerful support. Finally, thank you to Joan for her patience.
Dakhleh Oasis Project

References Cited:

Also, Dr. A. L. Hawkins reports as follows:
The 2005–2006 season was a study season, aimed at clarifying some outstanding questions remaining from my dissertation work.
From 14th to 23rd December I was occupied with re-examination of tanged tools from twenty localities (0, 72, 82, 130, 161, 187, 189, 216, 225, 228, 236, 283, 294, 325, 327, 328, 334, 335, 341 and 344) with the aim of determining what the method of manufacture of tangs is, whether tang form is correlated with tool type and what type of variation exists within sites and across the oasis.
From 23rd December to 1st January I examined cores from MSA workshop locations to determine the nature of variability within and between locations.

Holocene Prehistory
Dr. Mary McDonald reports:
I spent the months of January and February 2006 in the New Valley, dividing my time between Kharga and Dakhleh Oases.
I did field work in Dakhleh, spending 9 days at Loc. 264, and two days visiting three other locations: sites 301 and 006, and the area where a team studies the rock art. In addition, I processed material from Loc. 268, a site that we worked on last year. This work on Dakhleh material is reported on here.
Locality 264 is a Masara C, or Epipalaeolithic site in south-eastern Dakhleh Oasis, one of several hut circle sites within a small area. Discovered in 1990, and worked at again in 1998 and 2002, Loc. 264 has been gridded, mapped, its artefacts collected in a controlled manner, and some excavations already carried out.
This year I wanted to excavate in and around Hut 2, one of a group of 5 well-defined structures that form a semi-circle at the W end of the site (see Figure 9: Hut 2 is immediately to the right of the Hut 1). Hut 1 and Hut 5 have already been excavated and I wanted to test if there was any evidence linking the huts that might suggest the five belonged to some tightly-knit social group (perhaps an extended family?). I also wished to collect any organic material, charcoal or animal bone that might shed light on the site economy.
Accordingly, some 28 m² in and around Hut 2 were chosen and the surface features mapped at 1:20 (roughly squares C, D, E, F in rows 32 and 33.) Within this area 18m² were actually excavated. This includes E32 and 33 and the N half of F32 and 33. South of Hut 2, 2 m² of C33 N of the hut, and D33 within the hut. All squares were taken down to bedrock.
In the squares S of Hut 2, and interesting pattern of multiple small hearths emerged. In the 8 m² there was much evidence of burning, including patches of white ash, fire-reddened soil, and rich clusters of charcoal within the sandy silts. The E balk of E-F32 revealed that these constituted separate little fire pits, some of them dug slightly into the sandstone bedrock. There must be at least six such little hearths in the 8 m² of this year, and a similar pattern had been detected in 2002 in the 6 m² of bedrock in front of, or E of, Hut 1. It suggests if the pattern holds, that the whole area enclosed by the half-circle of Huts 1 through 5 may have been a communal meeting and perhaps cooking spot, with many little hearths built over time.
To test the idea, the area behind or N of Hut #2 was checked for signs of burning, while the area was being mapped, and 2 m² just N of H8ut 2 were dug to bedrock. They yielded a few isolated fragments of charcoal, but none of the
evidence for intensive burning, suggests this area behind the structure, outside of the circle as it were, was not chosen for fire pits.

The interior of Hut 2 was not cleaned entirely. Instead the western 2/3, including the entranceway, were excavated this year. Like Hut 1 and Hut 5, Hut 2 proved to be semi-subterranean, consisting of a pit with sloping sides dug up to 50 cm into the soft sandstone bedrock. The circle of stone slabs visible on the surface today would have stood on edge on the rim of the pit, for extra protection from the wind, or to support some kind of a superstructure. Many of these stones had fallen outward and now lie flat or flopped down into the pit, lying on the sloping wall. The floor of the pit is not paved with slabs, but several flagstone-like stones are scattered on its surface. Hut 2 resembles Hut 1 in that the entranceway consists of a sloping ramp.

Finally, very little animal bone, at best a few undiagnostic scraps, were found either outside the hut or within it. However, several soil samples were collected from the hut floor and from the hearth area in front of it.

Other site visited this year include Loc. 301 and 006. Loc. 301 was a hut circle site found in 1992 by Kleindienst and Churcher. They were unable to find any diagnostic artefacts to help date the site. As we currently have no slab structure sites in the western part of Dakhleh, it seemed important to try to date the site. Unfortunately, although we had a good description and a GPS for the site, we were unable to find it. There is a lot more sand in the area than a dozen years ago, and the site may simply be buried.

I also visited Loc. 006, a site in western Dakhleh near the Temple of Deir el-Hagar, recorded in 1979. At that time I had not yet established the late Prehistoric sequence. Since the site yields important fauna, it seemed desirable to date the site more exactly. A survey of and collection from one newly-eroding spot revealed that the assemblage is Early Bashendi A, like Stake Hollow at Loc.228. As we have relatively few Early Bashendi A sites, it is good to be able to add 006 to the list.

At the request of the team from Poland recording the rock art in the ‘Painted Wadi’ between Balat and Ezbet Sheikh Muftah, I went out to attempt to date a cluster of hut circles atop a hill near one of the important rock art panels. The team reported that there was no pottery, but some chipped stone amongst the structures. Unfortunately, the chert proved undiagnostic — very few, mostly small pieces, most with only natural breaks, and no formal tools. Possibly, the only way to date the site may be to excavate one or more of the structures, in hopes of finding datable evidence.

Finally, Loc. 228 is a Masara hut circle site near Loc. 264, which we mapped and collected last year. The collection of some 70 tools yielded interesting evidence suggesting many of the tools were modified for hafting. I needed illustrations for an article I am preparing on the subject. Accordingly, I have drawn a dozen of the tools, while B. Churcher a DOP photographer, took photos of a group of these tools.

**Figure 9** Site 264, a Masara hut-circle site.

**Petroglyph Unit**

Fieldwork in 2006 has been carried out from the 14th to 26th of February. The Petroglyph Unit this year was represented by Michal Kobusiewicz from the Polish Academy of Sciences, Ewa Kuciewicz and Eliza Jaroni, both of the Poznan Archaeological Museum. Additional help was from Fred Hardtke from Sydney University.
Work concentrated in an area first discovered in 2003. At that time it was only noted that the abundance of rock art there would make it worth returning in future seasons. Season 2005 brought even more discoveries but most of all allowed us to survey more of the area, which resulted in choosing one specific zone where we decided to accumulate our research this year. It is a prominent wadi in the area of the central Oasis (aerial photos covering its whole length – 70/32 – 38), which has been given the working name of the ‘Painted Wadi’. Taking into consideration our short, time we decided to focus on the central part of Wadi. The limits of the area are shown on plate 10 (according to the D.O.P.

The main purpose of the work this season was a detailed documentation of all the manifestations of human activity in that area. Every hill in that region has been carefully searched, the surrounding vicinity and the surface of the wadi itself surveyed. The reason for such a detailed research is the lack of data which could help to date the rock art and also of obtaining some idea about the pattern of the distribution of petroglyphs from different times. Until more sophisticated methods are available, we must rely on the simple spacial connections between the existing rock art and the living sites found close to them. The area is very rich in flint material, in the majority Middle Palaeolithic and Neolithic. Fire places and grinding stones suggest some temporary camping places, huts on the top of more prominent hills (Plate 12), sometimes quite numerous, even up to twenty, and at least one watch post of the Old Kingdom origin. We hope, that as well as a detailed insight into the distribution of rock art, it may give some positive results.

Eighteen sites with rock art has been recorded (Plate 10). All of them have been photographed, traced on transparent folia and described in petroglyph sheets, paying special attention to all superimpositions and variations in techniques used for executing petroglyphs, hoping that it may bring us closer to identifying its creators. According to a stylistic typology, we may initially describe the petroglyphs found this year as belonging to 1. Arab times (tribal signs, animals typical for the period, inscriptions), 2. the dynastic period (cows executed in certain style, stylized human figures etc.), and 3. earlier, probably of neolithic origin. The last category is the most impressive, not so much in quantity but certainly in quality (Plate 11).

We decided to try out a new method of recording rock art – the site nr 4 has been chosen and a method of orthophotography has been applied. As a result we can obtain photos of big panels with rock art without any perspective distortions and of high quality – allowing enlargements suitable for exhibition purposes (Plate 13).

Also the experiment with ochre used for colouring the petroglyphs has been continued – using IFRAO scale, digital photos of scenes made in 2003 have been taken, and with the help of a computer program, will be compared to data obtained last season.

The area covered this year constitutes about 1/6 of the length of the ‘Painted Wadi’. Our goal is to record in similar way the whole wadi, probably adding new factors, after analyzing data obtained this season.
Figure 11  Some of the rock art recorded in 2006 (sites 5 and 14) –
Figure 12  Living Sites in the Vicinity of Petroglyphs
The field work at ‘Ain el-Gazzareen in November/December 2005 began on 1st December, 2005, and continued to 15th December, 2005. We had planned to begin on 16th November, but delays held us up.

The field work this season concentrated on two aspects, given the short time. Part of our team concentrated on exposure of the main enclosure walls around the core of the site (see plan), and another part made a total surface pickup in the south-central part of the enclosure and a test excavation in part of one room adjacent to this area. Both were successful.
Figure 14  Eastern enclosure wall and interior rooms.

Figure 15  Enclosure wall south-east corner, a round tower.
The exposure of the enclosure walls (Figures 14 and 16) has conclusively demonstrated that the wall surrounding the core of the site is about 3.20 m thick. It appears to have been constructed in two separate sections, each some 1.60 m wide. The joint in the construction is straight and no bonding is apparent. Like all Pharaonic construction, the wall is well built and well surveyed. This construction is apparent along the east wall, through which is an entrance, placed off-centre, about 19 m north of the south end. At the south-east corner we found the remains of a round tower, some 3 m internal diameter (Figure 15). It does not seem to have been bonded to the main corner and was probably built after...
the wall was constructed. The height of a 3.20 m wall ought to have been at least 5 metres, although there is no evidence for this and it may have been higher. At a distance of about 35 m from the east end of the wall, there is a small jog northwards, with a rounded end. This part of the wall is not yet completely clear and will need further exposure.

We also traced much of the northern enclosure wall. It has been cut through by a channel of a later well that was excavated into the site. The cut was some 25 m west of the exposed end of the wall and all that section of wall was traced. On the west side of the well cut, the wall was again picked up and exposure continued for another 35 m, leaving only some 10 m or so to the north-west corner. This wall is, again, well built, but in two parts and of the regular thickness of the E and S walls. Next season we plan to complete the exposure of the enclosure wall in plan, and perhaps excavate beside it to expose its preserved height.

The pickup area occupies most of two 10-metre squares. All sherds, flints, ground stone, and bone fragments were gathered and have been sorted. They will be analysed in the near future, time permitting, by the various experts in pottery, stone and faunal remains. This will be reported in due course. Such a pickup enables us to associate specific activities with particular parts of the structure, an important aspect of site interpretation at such an eroded site.

The excavation test was into the southern third of a long room, part of a larger structure, to examine the inside part of the south enclosure wall. The room was not excavated to any floor and more work will have to be done another season. There were several layers of compacted mud, ash, and building debris. All the potsherds and other finds from this excavation have been collected and labelled according to the level that they come from and, like the pickup materials, will be analysed to give us an idea of the life of the room. The ash will be examined for plant remains. Excavation here has reached a depth of 0.65 m. Three well made chert knives were found in the excavation of this room.

The season was successful in that it has produced good new information about the enclosure. Thoughts arise about the defensive works of the sixth dynasty in the oasis and their relationship with the Sheikh Muftah peoples already in the area. Much more work needs to be done at this site before any definitive statements can be made about its historical importance.

The staff consisted of 3 persons – the director, Mrs. Mills and Miss C. Beauchamp. The crew was small, in order that careful control could be kept on each aspect of the work. The SCA representative this season was Mr. Ala’ Abdel Halim Abdullah, who was most useful and a very pleasant person to have at the work. Professor Olaf Kaper assisted by copying several seal impressions from the site.

Dr. Michal Kobusiewicz reports on his analysis of chipped stone materials.

Starting from 13th February, I continued studies of the chipped stone assemblage from the site ‘Ain-el-Gazzareen , dated to the 5–6 Dynasty.

Whole materials excavated in 2002 were analysed and the choice of selected specimens were drawn and photographed.

Analysis of materials from 2004 began – units 111, 113, 134 and 135 were done and a choice of selected specimens was drawn and photographed.

A number of biface trimming flakes was selected, described, drawn and photographed.

More retouched tools from special collection (Sq. 016, maters 1–50) were drawn for publication.

From the same square a sample of cores was chosen for drawing and photographing.

Drawings are also made of three bifacial knives found in 2005 in unit 272 and of an old, probably from Lower Palaeolithic clevers collected by inhabitants of Gazzareen as raw material.

The type lists of cores, debitage and retouched tools was checked and corrected slightly according to the results of latest investigations.

Professor C. S. Churcher has studied the animal bones and reports as follows:

‘Ain el-Gazzareen (32/390-K2-2) is an Old Kingdom Site with a rich archaeofaunal record (Mills, 1999–2000: 3–4). Previous work in the years 1998–2005 (Churcher, Faunal Reports for each year) revealed a diverse fauna of domestic cattle (Bos taurus), goat (Capra hircus) and Dorcas gazelle (Gazella dorcas) with varied minor domesticated components as donkey (Equus/ Asinus asinus), rabbit (Oryctolagus cuniculus), goose (Anser anser), duck (Anas platyrhynchos), pigeon (Columba livia), and wild fauna of Dorcas gazelle, desert fox (Fennecus zerda), gerbil (Gerbillus pyramidium), house mouse (Mus musculus amoena), ostrich (Strathio camelus) mainly represented by egg-shell fragments, a Nile catfish (Clarias sp.), Nile oyster (Etheria elliptica), apple snail (Pila ovata) and turret snail (Melanoides tuberculatus). Small birds and rodents were also present. See Churcher (2000) for discussion of sources of error in the collection and analysis of the samples.

This year’s report for 2006 identifies the materials recovered from a surface collection and therefore is probably founded on specimens from more recent times.
The 2006 faunal identifications does not alter the spectrum of taxa recorded from 1998 to 2005. The perception that cattle and goat provided the main source of protein still obtains and Dorcas gazelle is still a constant but minor source of protein (never providing as much as 3% of the protein, and only 2.55% here). Rabbits (Oryctolagus cuniculus) are another minor protein source (5 records in 2005 [Churcher, 2005], and 3 in 2006). Butchery was usually effected by smashing the longbones with stone mauls, though some instances of axed vertebrae or joints were noted. Sturdy longbones of goat and gazelle provided the most often selected materials for fabrication of awls (1 in 2006). A more detailed discussion of the previous work and the sources for error in interpretation is provided by Churcher (1999, ‘Archaeology’, in Mills, 2000). The minor faunal elements may be ignored as they contribute little to cultural information about the settlement or its activities, although they add to environmental information.

Fauna identified in the 2006 sample with number of occurrences in samples in brackets.

Cow (Bos taurus) [13, 1 juvenile]; goat (Capra hircus) [25, 1 juv., 4 horncores]; Dorcas gazelle (Gazella dorcas) [9, 1 juv.]; donkey (Equus asinus) [1]; fox or small dog (Vulpes or Canis sp.) [1]; rabbit (Oryctolagus cuniculus) [3]; gerbil (Gerbillus pyramidium) [1], house mouse (Mus musculus amoenaus) [1], ostrich (Struthio camelus) [4 eggshell occurrences]; duck (?Anas sp.) [2]; small birds [2 occurrences]; ‘snake’ [1 vertebra]; ‘fish’ [3 vertebrae]; Nile oyster (Etheria elliptica) [1]; apple snail (Pila ovata) [2]; and turret snail (Melanoides tuberculata) [13].

References


Dr. Colin A. Hope reports on his excavations as follows:

A season of approximately six weeks was conducted by the Monash University team, three weeks devoted to work at Ismant el-Kharab and two weeks at Mut el-Kharab. This work was funded by Columbia University and Australians Studying Abroad respectively, and many of the expedition members funded their own participation.

Ismant el Kharab

1. Area B/3/1: The ‘Villa’, Figures 17–18

Excavation of this large mud brick structure commenced in 2005 with surface clearance to delineate the major structural alignments in the central building and relatively small-scale excavation in five identified rooms. The excavation demonstrated that elaborately decorated, gypsum plaster was at least partially preserved on the majority of walls and that some original floor levels were preserved. The work exposed during excavation of each room was restricted as it became apparent that large-scale plaster conservation would be necessary if extensive areas of wall were exposed.

In the 2006 field season excavation focused on two areas: Room 1, a large central space that, at surface level, appeared to contain four large columns in its northern part and at least two square piers marking the entrance into a narrower southern part; and Room 10, partially excavated in 2005 when in was found to contain significant amounts of modelled gypsum plaster including architectural and statue fragments.

Room 1

Two excavation trenches were positioned within Room 1: Trench A was located to investigate an area in the south-west quadrant of the room and the transition point between the area containing the mud brick piers and that containing the columns; and Trench B abutted the northern end of the room.

Trench A
The trench measured 14.5 m north–south, with the southern portion extending from the eastern wall for a width of 2.25m and the northern end of the trench widening to 4 m to abut the entrances into Rooms 2 and 3, which lie to the west. The maximum height of wall preservation was 1.9m. Following the removal of some surface sand it was evident that the entire trench area was filled with rubble. The uppermost fill of the trench consisted of wall collapse including mud bricks, mortar and decorated wall plaster. Beneath this rubble was a compacted layer of roofing collapse including mud plaster, palm ribs, plaster with palm-rib impressions and decorated roofing plaster. Ongoing excavation determined that the northern edge of the mud brick pier marked a transition from a southern room to a second architectural space in the north. The two rooms are evidenced both by the architectural remains (walls, a door sill and evidence for an original doorjamb) and a difference in the decorative scheme of the wall plaster.

In the southern area the walls are decorated with panels on an overall green ground, the lower two of which remain mostly in situ: a dado of painted rectangles in which are floral sprays from the centre to each corner, and above an intersecting circular pattern in black outline, of which the ellipses are filled with white dots thus converting the motif into one resembling attached four-petal flowers, with rose petals between, all framed by a vine motif in white (plate 19). The grid used to lay out the design is visible in places (Plate 20), as are holes made by a ‘compass’ to draw the circles. Numerous discoveries from the room and its environs attest the occurrence of a design similar to the latter but executed in modelled white stucco; whether this ornamented the walls or roof is uncertain. Fragments of very thick painted plaster with a significant sand component were also found in the area. The design upon this material is uncertain as it has mostly been covered with a thin white plaster, but it was vibrant, polychrome and with geometrics; again its original positioning is uncertain but some fragments are attached to mud plaster with palm-rib impressions, indicating a location within an upper level, while some is attached to plaster with impressions from bricks. Definite ceiling plaster occurs in deposits over the earth floor of the room, painted with geometric patterns interspersed with busts of Isis and Serapis-Helios (Plate 21). In the northern area the west wall is decorated with rectangular panels containing figurative elements including a female bust and a bird; this design occurs upon the north wall of the area also. No clearly defined decorative roof plaster was recovered from the northern area.

In both the northern and southern area floor deposits were exposed indicating a secondary usage of the structure for animal stabling. In the southern area poorly preserved remnants of a gypsum floor were evident below the stable deposits. A test cut below floor level indicated that the floor’s foundation consisted of mud brick and plaster rubble, which was compacted to form a flat upper horizon. In addition, a mud brick wall and plaster floor level predating the main structure were revealed. These earlier structures had been cut through for the insertion of the west wall of Room 1. The original floor level in the northern area of the trench at present remains unexcavated but the remains of either a plastered bench or step running west-east adjacent to the north face of the square pier and the doorway into Room 2 was found, further distinguishing the section of Room 1 with the columns from that to the south. Between the square pier and the northern end of the west wall of Room 1 before it widens into the area with the columns traces of a sill and frame of a door once set into these features was discovered. Whether doors closed off the area between the two piers also is unknown. Like those into Rooms 3 and 4, the wood of this door has been removed causing substantial damage to adjoining walls.

**Trench B**

Trench B abutted the northern wall of Room 1, extending from the door into Room 9 on its east to the edge of a door adjacent to Room 8 on its west; it measured 3 x 9.9 metres. The trench incorporated the northern two of the four brick columns that originally supported the roof of this part of the room. Removal of the immediate surface debris revealed a deposit of windblown sand that in turn overlay a deep, sloping, deposit of rubble rich in roofing material, particularly lengths of palm ribs, rope and mud roofing plaster. It was also rich in gypsum plaster, largely decorated wall plaster, but also moulded architectural elements such as volutes and acanthus leaves from the capitals of the columns, and fragments of anthropoid sculptures. Across the eastern margin of the trench this rubble overlay a flat horizon of chaff-rich sand, presumably representing a period of re-use of the structure as a stable. Across the western margin a mound of dense mud-brick rubble largely devoid of roofing material lay between the roofing debris and chaff layer. A sondage was opened through the chaff fill in the eastern end, incorporating part of the eastern column. This revealed the poorly-preserved remnants of a possible brick floor, badly damaged by fire and dampness, with a patchy gypsum surface. Around the base of the column the edge of a square, brick foundation platform could be discerned at sub-floor level.

The north and east walls stand to around 1.5 metres and preserve a series of painted panels on a green ground with birds and one female bust at their centres, separated by floral motifs, above a painted masonry design (Plate 22). The female bust occurs in the panels due east of the door at the western end of the wall. The columns preserved, over an earlier layer of red paint, a ‘trellis’ motif again on a green background. The same decoration began to appear on the northern end of the east wall and certainly continues further south, on the outer wall of Room 10. It occurs on the northern face of the square pier in Trench A. A few fragments of green-painted mud plaster that probably originated from a roof were recovered, along with a number of thick white gypsum or mud fragments with impressions typically associated with roofing material.
Room 10

This room is located in the north-east quadrant of the building and measures 3.7 x 1.8 m; its walls are decorated with an ashlar masonry design executed in red on a pink background. Excavation progressed through one main rubble horizon, first revealed in 2005, rich in fragments of gypsum wall plaster, architectural mouldings and statue fragments, which overlay a well preserved gypsum plaster floor. Amongst the statuary were fragments of life size, mainly pieces from hands, and several small-size pedestals to which parts of feet either adhered or could be attached. Several pieces from over-life-size statues were found in 2005. At least one pink-painted statue is attested by fragments from the body; another fragment derives from an arm and is ornamented with a snake bracelet.

A small pit truncated the floor in the south end of the room. A section was opened through the floor at this point, revealing a deposit of rubble packing overlying an east-west brick wall with a possible brick bench abutting it to the north, built upon bedrock. These earlier features were deliberately cut back and both were overbuilt by the east and west walls of Room 10 proper. This evidence of structural modification is supported by the surface remains visible around Room 10, where a number of walls appear to be blocked in by later walls. The sub-floor rubble contained a few small fragments of painted gypsum plaster that seem to belong to an earlier decorative scheme. A clay tablet incised with a Greek text was found within the rubble south of the earlier wall; it contains a list of names amongst which is Psais the priest.

Minimal fourth century ceramic material was found and the majority from the collapse of the structure and the floor deposits was of first to early third century date; the first piece of Meroitic eggshell-ware pottery from Dakhleh was found in rubble at the northern end of Trench A in Room 1.

2. Area B/3/2: Pigeon Loft

The structure B/3/2 is located a short distance from the ‘Villa’ (B/3/1), at the north-west corner of an open court that links these two structures with others on the west. To the south of B/3/2 and east of B/3/1 is a complex of rooms and to the south-west another structure similar in plan to B/3/2. A fairly dense scatter of potsherds covered the structure and its immediate surrounding area. These were collected and weighed – there was 362 kg; they derive predominantly from pigeon nesting pots. The overall dimensions of the four-roomed building are 11.2 x 8.95 m. It actually comprises two separate structures adjacent to one another, each consisting of two rooms on a north-south axis. The eastern structure (8.95 x 6 m) is built from reddish mud brick and has rounded corners; the western structure (8.95 x 5.2 m), is in greyish mud brick, and was built against the eastern one. Both were originally barrel-vaulted; the vaults were clearly breached in the past and the two northern vaults did not survive particularly well. During excavation it was necessary to remove portions of these vaults in order to avoid their collapse. Ceramics used in the construction were kept but were found inadequate for dating purposes.

The excavation focused upon the western structure; Room 3, on the north, measured 2.78 x 2.6 m and Room 4, on the south, is 2.78 x 2.7 m; they are connected by a door at the western end of their common wall. Both were cleared down to floor level. Pockets of rubble and wall collapse were encountered in Room 3. The collapse was concentrated in an area contained by a secondary, north-south, partition wall constructed due west of the door into the room through its north wall, which effectively divided the room in half. This area had received a flat roof of palm ribs supported on a series of short wooden beams that were once set into the walls of the area and supported on the partition wall. Both Rooms 3 and 4 bore evidence of stable use at levels approximately 30–40 cm above the original floors. At these occupation levels varied artefacts were encountered including several baskets, pieces of leather and a few animal straps/harnesses. Diagnostic ceramics from these levels indicate a second-third century CE date. A significant number of inscribed jar doockets, either still set within mud jar seals or detached from their sealings, were found, especially below the stable level in Room 4. Of the 37 that were legible, 17 record the name of Psenamounis the son of Pinachtches, 7 that of Neferos, and 4 that of Psais the priest; other names are Psennesis, Patos, Psais son of Porax, Pnounis son of Horos, Inaros, Piebos, and Pinau or Pinag son of Tithoes. The orthography of the writing and associated ceramic material indicate a date within the second or early third century CE for this material.

Some external clearance was undertaken, focusing primarily on the north of Room 3 and to the west of Rooms 3–4, but also on the south and east of the complex. Again, much mud-brick rubble was cleared on all sides and found to contain quantities of pigeon pot ceramic; in total this amounted to a further 1070 kg. An almost complete stairway abutting over half the length of the west wall was revealed, as well as an unusual floored surface situated above straw layers well above the surface upon which the structure was built. The stairway met ground level in line with a mastaba along the front (north) of the building and would appear to have provided access to an upper storey now absent, from which the surrounding rubble likely derived. The mastaba continued along the west of the loft, behind the stairway, where ground level was also reached.

Although the details of the upper storey cannot be reconstructed with certainty, it is probable that the walls contained cavities into which the nesting pots found in large quantities around the building were once set. It was likely open to
the sky to enable easy access for the birds, which would have provided a convenient source of food and fertiliser. Similar structures are found in various parts of the oasis, especially in the western half. The suggested design of the structure is supported by a study of the ceramic material. From outside and above the structure 1607 kg were collected while from within Rooms 3–4 394.3 kg were recovered; by dividing the weights with that of a single complete pigeon pot (8 kg), it can be estimated that the minimum numbers represented are 201 outside and 50 inside. It is of interest to note that the only two pigeon lofts noted at Ismant el-Kharab are in close proximity to the complex of painted buildings of which B/3/1 is part.

Figure 17 Ismant el-Kharab, Area B and location of B/3/1 to B/3/3.
Figure 18  Ismant el-Kharab, Plan of B/3/1 and B/3/2.

Plate 19  Ismant el-Kharab, B/3/1 Room 1a West and South Walls.
Plate 20  Ismant el-Kharab, B/3/1 Room 1a West wall detail.

Plate 21  Ismant el-Kharab, B/3/1 Room 1a Ceiling Decoration.
Dr. K. A. Worp adds this report to that of Dr. Hope:

During my stay in the field, I studied a number of Greek ostraka found earlier by Dr C. A. Hope during his excavations in the Dakhleh Oasis in the course of the winter seasons of 2004/2005 and 2005/2006 at Ismant al-Kharab (= ancient Kellis) and Muth (= ancient Mothis). These ostraka throw new light upon the life of Greeks and Egyptians in the Dakhleh Oasis. Most of the texts turned out to come from Roman Egypt (30 BCE – 284 CE), others from the Ptolemaic period (330–30 BCE), while a few turned out to date from the early Byzantine period (284–400 CE). Furthermore, I studied a newly found Greek clay tablet and a number of newly found papyrus fragments.

The ostraka: From Muth came circa 20 texts, still unregistered, predominantly from the Ptolemaic period, but some from Roman or even later times; a few (two or three) may even be labelled ‘Coptic’. Many texts do not appear to yield intelligible text; in case their nature could yet be established, they turned out to illustrate matters of administration and taxation. One of these texts presents a real novelty in mentioning the (royal) bank in the Oasis in a 50th regnal year, Thoth, i.e. as early as September/October 121 BCE, in connection with two payments, (a) of an amount of 1000 drachmas for wine ‘for (the cult of) Osiris’, resp. (b) of an amount of 110 drachmas for linen (most likely for the same purpose, though this is not indicated expressis verbis). From Kellis: most of the approx. 55 still unregistered ostraka come from Area B/3/2; these are small chits presenting a short text (mostly a personal name + patronymic) distributed over 1, 2 or (rarely) 3 lines. Evidently, they belong to jar stoppers and quite a few of these are found still being ‘in situ’, i.e. pressed within the original (clay) stopper. A substantial number of these texts mention the same person more than once (the name of, e.g., a certain Psenamounis son of Pinachthis is found on 17 chits). The precise function of such jar stoppers is now subjected to a detailed study by various scholars. Other Kellis ostraka, esp. those 13 already registered as SCA 2749, deal mostly with matters of taxation, i.e. the payment of the poll tax in Roman Egypt. The earliest texts in this group seem to date from the reign of the emperors Trajan and Marcus Aurelius, others may rather date from undetermined reigns during the 3rd century. To be sure, among the SCA 2749 texts there are also two demotic ostraka (B/3/1/1 and C/2/8/23).

The clay tablet (for a similar object cf. C. A. Hope and K. A. Worp in the Festschrift J. Bingen [Brussels 2000], 471–86, No. 116) comes from Roman Kellis. Being the 2nd representative of this class of documents known to date, it presents – again – an administrative text mentioning a number of Egyptian and Greek personal names.

The papyri (all from Kellis): one small fragment contains a list of numerals [1–3] 4–30, possibly related to the 30 days within a given Egyptian month. The other fragments are very scrappy (most of them are not larger than 0.5–1 x 1–1.5 cm). While they present remarkably tiny handwriting, in practically all cases too little of coherent text remains for providing us with significant information. One slightly larger fragment yields at least the name of the addressee of a letter, Pisisistratos. The same name occurs in other documents from Kellis, but there is no reason to think that only one villager could have borne this name. Another scrap yields the Greek word *ploion* = ‘ship’. Clearly, this refers to an event in the Nile valley or even further away. As far as aspects of dating are concerned, I would prefer to give only a very broad dating ‘Roman’, i.e. I have not encountered parts of any particular dating formula by a Roman emperor or a consular pair.
Mut el-Kharab

The short excavation season at Mut el-Kharab aimed to complete work commenced in 2005 within the north-west and south-east corners of the temenos, and within the central temple area, and also to explore further the eastern, north-south stone wall of the temple building that was revealed during work in 2004 and 2005 (Figure 23).

Figure 23  Plan of Mut el-Kharab with locations of excavated units.
1. The south-eastern corner of the Temenos: Trench 22: Figures 24 and 25

The excavation of Trench 22 commenced in February 2005; the trench, measuring 10 x 6 m, was located adjacent to the south-west corner of a large rectangular structure (Context 12) of light-coloured mud bricks that dominates the south-eastern corner of the site, in order to investigate the nature and the relationship of this building to surrounding architectural elements. Excavation during the 2006 season aimed to continue delineating this structure, to determine its date and that of the Temenos wall to its south, and to identify the nature of activity represented in the archaeological remains. In order to achieve these aims the excavation area was extended to the north and west by an additional 8 x 4.5 m.

Excavation recovered large volumes of fragmentary and some intact ceramic vessels dating from the Late Period to the Early Ptolemaic period associated with structures that had been cut through for the building of the Context 12 structure. Amongst these were imports from other parts of the Mediterranean. Another large east-west wall was revealed (Context 62), the north face of which had also been cut through during the installation of the rectangular
structure (Context 12). At least one, and potentially two, additional walls were identified abutting this wall on the south, almost filling the area between the Temenos wall and the rectangular building (Context 12), but whereas wall Context 62 extended across the trench these southern walls terminated at the eastern edge of the trench. Additional excavation will be required to clarify the nature of these sizable structures. It was not possible to reach the base of the Temenos wall during the excavation period, though the probable base of the Context 12 structure and the base of the Context 62 wall were reached, both set upon compact red clay. A small number of ceramic sherds were recovered from fill abutting the lower part of the Temenos wall; once analysed these ceramics may provide valuable dating evidence. In the northern extension to the trench two additional mud-brick walls were revealed (Contexts 67 and 70). These walls and a third wall identified in 2005 (Context 21) have all been interrupted at their eastern end by a construction cut for the rectangular building (Context 12). Small areas of brick flooring associated with these walls were also exposed. No sub-floor excavation was possible during the excavation period. The majority of ceramics recovered from fill in this area of the trench were from the Late Period or Early Ptolemaic period. Expansion of the excavation area will be required to investigate further these structures.

The majority of artefacts recovered from the excavation area were ceramic vessels, both fragmentary and intact. Quantities derive from a deliberate dump under a section of brick floor that abutted the temenos wall and a late upper wall; from this came several intact or reconstructable vessels, including a local imitation of a Greek form, an *askos*. This is the second example of a local imitation of a Greek form; from this trench in 2005 came a *kantharos*. In addition a number of ostraka were recovered all of which were contained within rubble fill. Other finds include several fragmentary ceramic figurines, faience vessel fragments and faunal/bone remains.

2. The north-western corner of the Temenos: Trenches 23 and 26

In the north-west corner of the site excavation continued in Trench 23, first opened in 2005. The excavation area measured 7.7 x 5.3 metres. It was aligned along the west face of a large structure with partially standing walls (Context 6), and contained to its west by a wall (Context 2) that continued northwards to abut the Temenos. In 2005, excavation revealed just below the surface a poorly constructed east-west wall (Context 15) that seems to have been associated with the large structure (6). This effectively divided the excavation area into a north and south space. By the end of the 2005 season excavation in the former had revealed a major north-south wall (11) along the eastern margin not too distant from the large structure, whilst the top of a narrower east-west wall (19) was emerging to the north of the wall that divides the trench into two major parts. In the south space a group of circular ceramic ovens were uncovered, beneath a deep deposit of ash-rich rubble and just north of another broad east-west wall (24). Clearly several structural phases are attested by the remains that were revealed.

Both spaces were investigated further in 2006. The ovens were found to overlie a thick layer of ash (8). The easternmost oven was preserved only partially, and had clearly been truncated during the construction of (6). Beneath the lower horizon of (8) at least two probable surfaces were identified, separated by deposits of ashy rubble. In the lowest was a sub-circular depression filled with ash, possibly the remains of an earlier oven. At a slightly higher level across the western margin a group of large stone objects – possibly offering tables or basins – had been turned upside down, seemingly to form a rough floor. Ceramics associated with these levels – and the overlying ovens – were almost uniformly of Late Period date. A group of low brick walls abutted the north face of (24), built at a lower level than the oven group. Their function remains obscure, but it is possible that they served as small storage chambers.

In the north space, excavation through the rubble exposed in 2005 and an underlying ash deposit, further defined east-west wall (19). This extended towards north-south wall (11), the two separated by a low threshold. The foundation course of (19) was set at a higher level than that of (11), which may indicate that the former was an addition, modifying the space originally defined by (11). To the north of (19), just above the horizon of its footings, a denuded north-south brick wall was revealed (42), which turned westwards at its northern end to meet the thick north-south wall (2) and may have had a further eastward projection that joined it to (11). This group of walls was preserved to between one and three courses. Their relationship to the surrounding structures is not yet clear, but they appear to either be contemporary with (19), or to represent an earlier insertion between (2) and (11). Excavation in the space between (11) and the large structure (6) revealed an east-west wall (54) extending from the south-east corner of (11), beneath (6). The ceramic record was again largely of Late Period date. The deposits along the south margin of the space can be related to those in the southern part of the trench, and the oven group is clearly associated with the structures in the northern space, although with which phase is not yet clear.

The major artefact group recovered across the trench as a whole was ceramic, including many intact or near intact vessels. Twelve ostraka were found, and two small faience beads. Apart from bone, little organic material was preserved, undoubtedly due to the high level of salinity of the site.

A new excavation area, Trench 26, was opened in the north-west corner of the site, approximately 2 metres east of Trench 23. The aim of the work was to investigate the date and function of a large mud brick structure, the west wall of which had been partially exposed in Trench 23 (Context 6). Trench 26 encompassed only part of this structure, a rectangular space along its northern margin, measuring 5.3 x 2.5 metres. Excavation proceeded through several layers...
of sandy rubble, of varying compactness, to reveal a north-south wall (11) bisecting the space. Several large stone blocks were recovered. Most were undecorated, but one bore a floral motif in relief and is probably of Late Roman date, while another, of probable Early Roman date, preserved parts of several columns of a hieroglyphic inscription. By the end of the season compact horizons, potentially surfaces, had been reached either side of (11) but the archaeological deposit was clearly continuing. Although the ceramic recovered from the rubble deposits was generally of the Roman period or later, a date for the structure has not been fixed and nor is its function clear. Another point of interest for future work will be that of access with, as yet, no entranceways identified.

Central Temple Area: Trenches 24, 25 and 27: Figures 26 and 27
Positioned approximately 2 metres south of Trench 16, excavated in 2005, in which part of the eastern wall of the temple was revealed, Trench 24 measures 5 x 6 metres. Immediately after the commencement of excavation a roughly north-south oriented line of sandstone blocks too uniform to be random (Context 4) was revealed. Also found was a layer of crushed sandstone in an area corresponding to the north-south sandstone wall found during the excavation of Trench 16 in 2005. A mud-brick retaining wall east of the crushed sandstone layer also corresponds to a similar feature.
located in Trench 16. A wider wall of red mud bricks (Context 8) was uncovered near the western boundary of the trench, and this also can be identified in Trench 16.

In the south-east a platform was revealed with clearly definable mud-bricks (Context 9), possibly upon which the sandstone blocks of Context 4 were originally positioned, but as a late addition. South of this, an area of rubble was removed to reveal a deposit of Late Period ceramics, interpreted to be part of the Late Period ‘dump’ which occurs in this region of the site. Concerning the layer of crushed sandstone, excavation in its southern end revealed a lower layer of yellow sand. It is possible that this corresponds to the yellow sand found beneath the sandstone wall of Trench 16. As a result of these discoveries, excavations in this trench were terminated and transferred to Trench 27.

With regard to the ceramics, the majority of deposits were mixed, including forms from the Late Period through to Islamic. A small number of New Kingdom bread mould fragments were found in contexts 4 and 5; the latter also contained a form from the First Intermediate Period. Although no registered objects were found, five decorated blocks were recorded and of these, one preserved the hieroglyph ‘pt’ while another was decorated with a painted hkr motif.

**Trench 27** (Figure 26) is located approximately 1 metre north of Trench 15 which is due north of Trench 16; it measures 6 x 3 metres. Shortly after the commencement of excavations a red mud-brick wall, running north-south, became apparent (Context 3). This could be equated with a similar mud-brick wall which runs through Trenches 15 and 16 into Trench 24, and which has an exposed length of 22.0 metres. To the west of this wall in the central part of the trench three in situ sandstone blocks were found to be laid into a firm mud-brick surface. More larger stones, presumably from the same feature, were found throughout this area of the trench, but in disturbed positions (Context 9).

In the eastern part of the trench a large sandstone wall, previously encountered in Trenches 15, 16 and 24, was unearthed (Context 19); its western edge extended under the red-brick wall (Context 3), as was also the case in these other trenches. Immediately overlying this wall were two distinct contexts: the upper one (Context 8) was a thick layer of crushed sandstone rubble, and this sat atop a compact mud filling (Context 10). Many of the sandstone blocks in this wall are very fragile and not all are completely preserved. The two northern-most stones, both 40 centimetres in height, are not directly aligned with the other stones of the wall. The ceramics from Context 20, which is north of and abutting the sandstone wall (19) and corresponds to the height of the stone blocks, are of a Late Period date, including some 27th Dynasty forms. These two stones were not found to be sitting atop clean yellow sand, as was the case with the wall in other trenches; it is not known what the other blocks were laid upon as they were not lifted. The ceramics removed from the contexts below the bottom of these blocks (21 and 22) suggest they were laid directly on top of the 25th Dynasty pottery dump, which is present across this area of the site.

The northern section of the mud-brick wall (Context 3) was removed in order gain a better understanding of the areas surrounding the northern end of the sandstone wall. Contexts 26 and 28, originally distinguished (the former being directly below Context 3 and the latter being rubble attached to its western face) appeared, upon removal, to be part of one large wall with a width of approximately 1.20 metres. This wall was built on top of the sandstone wall and may have been built against part of its northern face. The upper wall (Context 3) and its associated features clearly represent parts of a very late building of some size, over the area of the dismantled temple, and may be of late Roman or Islamic date.

In the western end of the trench another layer of crushed sandstone rubble was revealed (Contexts 14 and 27). This was much deeper than the sandstone rubble deposit found in the eastern part of the trench above the remains of the stone wall, continuing down for approximately 1.2 metres. Below this rubble, a layer of damp, fine-grained soil was revealed (Context 32). At the southern end of this deposit a regular, possibly in situ sandstone paving block was found (stone N). The northern face of this stone was covered in chisel marks, with evidence of mortar present on the top, north face and north-east corner of the block. A mud brick wall (Context 29) was found abutting the southern face of this stone, and this likely abuts another wall running north-south (Context 25) and which is adjacent to the eastern face of the stone. The base of the stone and the adjacent walls are approximately at the same level; below the stone is a thin deposit of yellow sand. This block is significantly lower than those of the stone wall to the east, and the relationship of the two features awaits further clarification. North of the stone and below its base, under the sand, Old Kingdom ceramics were found, including several fragments from different Meidum bowls and bread moulds. On discovery of this deposit, excavations in the trench ceased.

In contrast to other trenches in this area, Trench 27 did not produce an abundance of ceramic material. The upper contexts contained pottery from the Roman Period through to Mamluk times, while deposits from above and below the stone wall (context 19) seem to be datable to the Late Period. Some New Kingdom sherds (bread mould fragments and an amphora rim) were found in context 9 and 24 respectively. As mentioned above, the lower parts of context 32 produced only Old Kingdom forms. Finds of interest include a demotic ostrakon and three fragments of a small sandstone statuette. The latter comprise a pedestal with feet, a torso and shoulder fragments. Amongst the stone fragments are two displaying possible Christian motifs and three with parts of hieroglyphic inscriptions.

**Trench 25** is located on the western side of the presumed location of the central part of the temple. It is to the west of Trenches 18 and 21 and to the north of Room 2 of Trench 6. The area excavated was initially 4.80 east-west by 6.50 north-south. This was subsequently extended on the south by a further 3.5 m. A 0.5 m baulk was left to divide the two sections of the trench. The area to the north contains a room constructed of yellow mud brick, built within pre-existing
red brick walls and it is thus similar to the room of Trench 18, except that the walls of the later stand much higher. Work in this section of the trench concentrated within this room. It was approached by a short corridor to its east that leads off a paved area between Trenches 18 and 6; it is 2.4 x 2.85 m. The room and the corridor were once paved with sandstone but the pavers had been removed from the room by robbers. Excavation continued in this room to a depth of 3.0 m below the floor level. These sub-floor contexts contained sand, with areas of ash and quantities of Old Kingdom ceramic with bones and pieces of flint; amongst the ceramics were pieces of probable Early Dynastic date. The section to the south had been cut into by robbers. The base and external face of the yellow wall that forms the north wall of Room 2, Trench 6, was revealed. Objects found within Trench 25 include a number of ostraká and some small faience and ostrich eggshell beads.

Excavations at Amhida, 2006

The site of Amhida (Dakhleh Oasis Project site no. 33/390-L9-1) lies a few kilometres south of the renowned Islamic mud-brick village of El-Qasr, in the northwest part of the Dakhleh Oasis. Amhida was the most important town of northwest Dakhleh in antiquity.

The excavations of Columbia University, as part of the DOP, were begun in 2004 after preliminary survey work in 2001 and 2002. Excavations that year focused on a late Roman house (designated Area 2.1). In 2005, an expanded team continued in that area and also began the excavation of the site of the Temple of Thoth (Area 4.1) and that of a less wealthy house in a northern part of the site called Area 1.3. During the 2006 season, work continued in all three of these areas, with excavation being completed in Area 1.3. In addition, conservation work was carried out in Area 3, the pyramid located near the road that runs to the east of the site, aimed at stabilizing this highly visible monument, the only largely standing pyramid off the Roman period in Egypt. The following sections describe work in each of these sectors during the 2006 season, which lasted from 7th January to 26th February. They have been written by the supervisors and specialists indicated in note 1 and edited by Roger Bagnall and Paola Davoli.

Area 2.1

This season the work mostly concentrated on the northern side of sub-area 2.1 in an area of approximately 14.2 x 8.4 m. Sub-area 2.1 constitutes the Late Roman villa and its immediate surroundings. At the northern end of the insula in which the villa is located, a large walled space already tested in the previous season was largely excavated (room 9). The adjoining rooms 10 and 15, forming part of the northern part of the insula were also partly excavated. Rooms 16 and 17, forming the corridor from the central part of the villa to the north were investigated as well. Furthermore, two test trenches were dug in the southern part of the villa: one through floor level of room 1, the main painted room, and one on the suspected location of the southern wall of room 14, the probable boundary between the villa under excavation and its southern counterpart.

This year’s excavations have presented a more complex picture of the villa and its surroundings than could be guessed from the results from previous campaigns. Especially the northern part shows that various building phases are present in the area, both reused in the architecture now still standing and buried under the floor levels from the last periods of occupation present at this part of the site.

Room 9

Room 9 is a large walled open space connected to the villa. From the surface no apparent working door openings are visible. Only in the northern wall a blocked up door is discernable. During the previous season part of a circular wall with associated white gypsum floor was discovered in a small test trench in this room. Furthermore, at a higher level a curved wall was discovered, apparently forming a containment wall for dump material.

The main goal for this season’s excavation of room 9 was to examine its relation to the villa to the south and to gain insight in the function of the circular walled structure. From the excavation it has become clear that the space now termed room 9, an area with maximum dimensions of 9.7 x 6.9 m, and the area beyond it was intensely used during...
various occupation phases. This is apparent in the different floors present at various levels in the room, the walls that belong to several building phases and some pits, clearly cutting architecture. The north wall of the room, for instance, shows at least five building stages, one either being built over or cutting the other. From the various walls excavated under the last level of occupation, it is clear that space was divided quite differently in earlier periods, as several north-south oriented walls clearly show (F119, F125, and F108). One of these walls (F108), or at least its foundation and several courses above that, have been erected in reused baked brick. This wall abuts the south-west running wall feature F131, part of the west wall of room 9 of which the foundation and several courses above it are also constructed in baked brick. It is clear that these walls belong to an early phase of building in (mainly reused) baked brick in the northern part of sub-area 2.1, including some walls in room 15 and most probably also several walls outside of the excavated area. The other walls in room 9 are constructed of mud brick. From the architectural evidence in and under the room it is thought that there are at least three to four main building phases present in this sector, probably all dating to the Roman period. The east wall and the north wall of room 9 are amongst the latest additions in the area.

The main, and most striking feature excavated in the area of room 9 was structure F93/F88. It is formed by a circular mud brick wall (F93), still standing to a height of 1 m, with a diameter of approximately 4.5 m and a partly collapsed white gypsum floor at the bottom of it (F88). The floor is laid out over a surface of large square baked bricks measuring approximately 60 x 60 cm covered with a layer of mortar. Underneath the floor a large hollow space is present, now largely filled with rubble. A small test trench through the middle of F88, in the collapsed part of the floor, revealed that this hollow space is at least 75 cm deep. The floor above the hollow space seems to be supported by stacks/pillars of baked bricks.

Wall F93 is not complete; on the north side it has been cut by one or more large pits. Most of the wall is however still in place. The outside of F93 is covered in mud plaster. The inside was plastered with white gypsum of which many patches remain. Striking features within the wall are three vertical channels, two of which still hold pottery pipes (fistulae) which reach below the level of F88. In at least one of these pipes soot is present, indicating that they might have functioned as channels for smoke. It is thought that four of these channels were present, distributed more or less evenly through the course of the wall. The bottom of the wall shows clear signs of erosion and repair, indicating intense use.

Probably during a second phase of use of the circular structure, a layer of compacted mud was laid out over the white gypsum floor. Several baked bricks and mud bricks were placed along the inside of the wall to act as a support for wooden planks/beans. On top of those beams, approximately perpendicular to them, wooden panels or planks were placed and secured with iron nails. It seems that together they formed a wooden floor covering the whole area within F93. The wood itself was no longer present. Brown humic sand where the wood had decayed, imprints in the layer of compacted mud and the iron nails, however, clearly indicated the location of the wood. On top of this level several complete bowls, pots, an oil lamp and fragments of two (?) glass vessels were found imbedded in sand. Together with a ceramic plate (small slab) and an ashy patch they constitute the last phase of use of the circular structure before it was turned into a dump area.

After the structure had been fully filled with dump material, mainly pottery and mud brick debris, a layer of mud was laid out over it and over the whole eastern part of the room. This now formed the new level of occupation, contemporary to the use of the walls which form the boundaries of room 9.

The primary function of the circular structure is not yet understood. It seems, however, probably to have been used for industrial purposes. F93/F88 might be contemporary to the earlier phases of the villa or even earlier. One of the boundary walls of what is now termed room 9 seems to be built on top of F93.

Room 10

This room is located next to room 9, only divided from it by two short stretches of wall. The dimensions of the room are 3.4 x 3.7 m. Wind blown sand was cleared from the room to reveal a debris layer and a rectangular mud brick structure, with unknown function. The lack of collapse and diagnostic bricks show that this room was not roofed. One floor level has been encountered.

Room 15

A most interesting room was excavated to the west of rooms 9 and 10. Room 15 is rectangular with the following dimensions: 2.7 x 6.8 m. From the excavation it is clear that the room must have served different purposes at different times and that it was heavily remodelled during the various phases of use.

During one of the earlier phases the room could be entered from the north through a large doorway. The walls of that phase were covered in white gypsum plaster which was re-applied at least once. On the northern half of the east wall five columns of Greek writing in red paint are visible at approximately, or just under eye height above the initial floor level. Several of them have been deliberately, but not fully erased in antiquity. Another column of more or less totally erased Greek writing is found on the northern part of the west wall of room 15. It seems that the texts and thus
probably also the room had an educational purpose (see report on Epigraphy and Papyrology). The north and east wall of this room are set on a baked brick foundation which can be connected to at least one of the walls with baked brick foundations in room 9. Associated with the walls in room 15 and most likely also to the phase in which the walls were used for writing, is a gypsum floor which has been laid out over a baked brick base. On top of this floor a later compacted mud floor was found.

During the later phase of use of the room the doorway in the northern wall was blocked. A staircase, a landing and an east-west orientated wall were erected in the southern part of the room. Beam holes were cut in both the latter wall and in the north wall (including the blocked doorway) and a flat roof was erected running approximately one meter above floor level creating a hollow space underneath and a walled, probably uncovered space above. This roof was made of large beams and palm rib and was covered with mud. Large blocks of thick mud with impressions of beams and rib have been found only in the southern part of the room, indicating that this part might have been the most heavily constructed part. The roof was supported from underneath by several piers/pillars of stacked baked bricks, - slabs and mud brick. The hollow space created underneath was most likely utilized for storage, as is attested by various more or less completely reconstructable vessels found along the west and north walls of the room.

The roof itself could be entered from the villa through rooms 17 and 16 and the staircase leading from 16 into room 15. At least during the later phase of its use, thus, room 15 was part of the villa.

Rooms 16 and 17

These rooms now form the corridor from room 2, the central courtyard, to room 15. Room 16 is formed by a late addition of two bonded walls which blocked passage into room 9. It is thought that room 17 once opened into 9. Both rooms have been excavated to floor level which mainly meant removing windblown sand. In 17 an arch and a vault are still found to be in place.

Test trenches rooms 1 and 14/18

Two test trenches were dug this season. The first was dug in the southeast corner of room 1, penetrating the levels under the floor uncovered in the 2004 season. The compacted mud floor was several cm thick and was placed on a series of preparation layers down to the bottom of the foundation. No older floor layers were discovered.

In the test trench between rooms 14 and 18, excavated to locate the dividing wall between two probable house units, a largely complete collapsed vault was uncovered. A dividing wall was not found. The vault was left in place to be preserved until the coming excavation season.

Area 4 (Temple)

Area 4.1

Area 4.1 has already been investigated during the 2004 and 2005 campaigns. In 2004 only a preliminary clearance of the squares AP49 and AR51 (10 x 20 m) took place. The first excavation was carried out last year in the squares AP49, AQ49 and AR49. This season we first focused on square AP50 (directly to the south of AP49). During the work, we extended the area of excavation and added the northeast quarter of AQ50. Also AP49 and the south easternmost portion of AQ49 were reopened. The surface of AN50 was cleared as well.

The aim of this season’s work was to clarify the layout of the temple and to get a better understanding of the underlying layers in which the many pits (described in last year’s report) have later been dug.

Surface

The surface layer in all the squares (DSU60 and DSU91) consists of windblown sand and is mainly characterized by the presence of scattered sandstone blocks, lumps of gypsum mortar, mud brick fragments, grinding stones (probably dating to the Old Kingdom) and a great amount of pottery sherds. The pottery is completely mixed and dates from the Old Kingdom to the fourth century AD (see the report on pottery).

Pits

After the removal of the surface layers (DSU60 and DSU91) and sub surface layers (DSU61 and DSU99) a number of pits appeared. This is in accordance with last year's experience. During this campaign at least 18 pits have been discovered. They differ in shape, depth and dimensions, but in general they are round, oval or elongated. Some pits are very large and irregular (F11 and F19 for example). They are the result of several intersecting pits. The southwest part of AP50 is still covered by sand, although circa 60 cm of windblown sand has been removed. It seems that we are
dealing here with more pits than the two now assigned (F37 and F39). Since we continued in three pits already opened in 2005 (F02, F11, F19), the total number of these features excavated this season is 21.

Since most pits cut one another, the pits in area 4.1 have obviously been dug at different times. Furthermore, part of the sediment that was thrown away while digging has been found at the bottom, in the fill, or on top of surrounding pits. As a result we sometimes encounter a mixed loamy deposit with a lot of pottery sherds and mud brick debris, as well as deposits in reversed stratigraphy.

After the pits had been dug, blocks of temple architecture have collapsed into the pits. This suggests that the temple itself (at least the Roman temple) must have been built on top of the layers in which the pits were dug. Some blocks have building marks (red and black lines, crosses and the so called 'fish' marks) or chisel lines.

One complete column drum (FN 22) and six large fragments of column drums were found. Except for one drum fragment, all drum fragments and the complete drum are located in the pits F02, F26 and F27 (in the south west of AP49, the north west of AP50 and the north east of AQ50), and form a cluster with the column drums found in 2005. One column drum fragment was uncovered in the northeast part of AP49. It was horizontally split. This facet suggests an intercolumn wall.

It is remarkable that the collapsed temple blocks are all concentrated in the northwest part of this year's excavated area, in accordance with the large concentration of collapse found in last year's squares. A number of decorated blocks and fragments of blocks fit together. Not only blocks that were found near each other in the same deposition or pit can be joined, but also blocks that were situated further apart in different depositions or pits.

In the south-east part of this year's excavated area we found only a few undecorated sandstone blocks near the surface. Instead, we encountered a lot of mud bricks (sometimes still bonded) and mud brick fragments. These originate from collapsed mud-brick walls. Among the bricks we also found a number of fragmented vault bricks. These findings suggest that we are just outside the temple, where probably some mud brick buildings once stood.

In the centre of AP50, outside the cluster of collapsed blocks we found an important block, FN 31. This is a large cavetto cornice, probably the lintel above the main entrance of the temple. Near this lintel, we found a dark sandstone fragment with a circular indentation, FN 56. In relation to the occurrence of the lintel and the supposed entrance, this object might be interpreted as a pivot hole of a door.

Stratigraphy

Thanks to the occurrence of one very deep pit (F32) in the east of AP50 we were able to examine the stratigraphy and the layers in which the pits have been dug. F32 is filled by DSU78, a very clean layer of windblown sand. Three meters of this DSU have been removed, but still we did not reach the bottom of the pit. It continues for at least another metre.

The lower two meters of the sequence visible in the interface of F32 consists of a dark greyish brown loamy deposit with mud-brick debris, many ash pockets and a lot of pottery sherds (DSU97). All the sampled pottery seems to date to the Old Kingdom. This thick layer, the lower elevation of which has not yet been reached, seems to be an accumulation of occupation layers. We might be dealing with a dump area that was in use during the Old Kingdom. Perhaps a bakery was nearby, since DSU97 has many ash pockets and since bread-molds and grinding stones are abundant in the whole area.

Above this thick layer, DSU95 and DSU94 were recognized. These are the first layers that we could track throughout most of AP49 and AP50, and the first depositions that are most probably uncontaminated. DSU95 is visible on the bottom of many pits, while DSU94 (above DSU95) has been cut by almost all pits. DSU95 is comparable with DSU97, but is brown in colour, has few ash pockets and less pottery.

DSU94 is a thin greyish green layer of circa 10 cm. Although the elevations differ slightly throughout the square, DSU94 forms an (relatively) undisturbed occupation level.

Very mixed and disturbed sediments cover DSU94. In the east and south-east a mud-brick collapse is present. This collapse (DSU93) is probably related to the loose mud bricks and mud brick fragments mentioned above. Also in the west a mud-brick collapse is visible (DSU102). In the north-west (DSU100) and in the north (DSU103) layers are visible that are likely to be sediments thrown away while digging pits. DSU100 and DSU103 are again cut by F02, F24, and F27. As mentioned above, people (treasure hunters?) dug pits at different moments. Apparently they didn't realize that they were cutting older pits and even were digging in discarded sediments.

Walls

During the excavation several badly disturbed stretches of walls were found. None of them were complete, as they have been cut by the pits almost everywhere. Furthermore a thick and hard incrustation covers the wall parts. Because of this it is almost impossible to distinguish bricks and bonding.

Six walls have been recognized. F34 is only visible in the interface of pit F32. F40, F41, F42, F48 and F44/F45/F47 (three fragments of one wall) are parallel and perpendicular to one another. F41 and F48 are orientated north-south,
while F40, F42 and F48 are orientated east-west. F40 is bonded with F41 in the west and with F48 in the east. F41 and F42 might be bonded. We dug a small test trench along F40, but we did not reach the first course, nor did we find evidence for a foundation trench. But in this trench we able to define the bonding of the wall. F40 has been built in English bond (brick dimensions: 30–35 x 20 x 6).

All six walls seem to cut DSU95. It is yet unclear if they also cut DSU94 or if DSU94 abuts the walls. Future excavation is needed to interpret these walls and to understand the building(s) that they formed. Compared to the temple, we can so far conclude that they belong to previous buildings.

AN50
In AN50 only a surface clearance was carried out. In the north east of the square, in the sub surface layer (DSU99), a small collapse of decorated sandstone blocks appeared. Among them were several pieces of torus cornices. After removal of the surface layers (DSU91 and DSU99) it is clear that also this square is full of pits. Some mud brick wall collapses were uncovered and a lot of loose mud brick fragments (35 x 16.5 x 9 cm) and baked brick fragments (29.5 x 13.5 x 6.5 cm) were collected. Especially the baked bricks are interesting, because they had not yet occurred in other squares.

Future excavation is needed to get a better understanding of the relation between the wall collapses and the decorated stones in this square, and the temple.

Area 4.2
Area 4.2 is located north of Area 4.1. Before excavation started in 4.2, the area looked like a small mound in which a very high density of rubble, stone cobbles, and gypsum mortar was scattered on top of the surface layer of windblown sand. These characteristics were thought possibly to indicate the presence, at a lower level, of remains of stone walls, perhaps related to a northern gateway to the temenos area. A small pit was dug on top of the mound during the 2005 excavation season, in order to create a fixed point for future topographical work at the site. The presence of stone blocks was noticed while digging the pit, and the work was therefore immediately stopped, with the aim of beginning scientific investigation of the area the following year (i.e., the 2006 season).

Before excavation started, the only feature clearly visible above ground, although only in part, was a wall running SW-NE (FSU 1); after surface clearance its preserved length (18.5 m) was revealed, together with parts of three walls perpendicular to it (FSU 4-6) on its East side. Another very decayed mud brick wall (FSU 3), running NW-SE, was identified to the NW of FSU 1. This wall seems to be perpendicular to FSU 1, although no traces of bonding between such walls are preserved. The clearance of windblown sand from the top of the mound extended to eleven squares (AP 44–46, AQ 44–47, AR 44–46, AS 45), although in some of these squares the removal of the top layer consisted of only a small area.

An intensive investigation focused on squares AQ 45 and AR 45, W of FSU 1, in its southern part. The excavation led to the discovery of several features, mainly foundation walls, of both stone and mud brick, to which FSU numbers 7–19 were assigned. FSU 8 is a mud brick wall running NW–SE, resting on a layer of dark soil and in a very poor state of preservation. Part of the top of this wall was already visible after the first day of surface clearance. A crack across the width of the wall is visible in its East part, with a sector of it seemingly slipped to the East of this crack. In the corner where FSU 8 is abutted by FSU 7 (a sandstone wall running NE–SW) a cut in the wall (FSU 22), with few mud bricks in it, might be related to a higher course (now lost) of FSU 7, or to FSU 21, a mud brick wall running NW–SE, presently in a very bad state of preservation. FSU 21 seems to abut FSU 8 against its Eastern edge, with possibly two (preserved) higher courses of FSU21 on top of FSU 8. The junction of FSU 21 and FSU 1 (the long mud brick wall mentioned above) has not yet been clarified and awaits further investigation. The north-eastern corner of FSU 21 is not discernible, due to the cutting of a large pit on the top of the mound (FSU 24).

Bonded to FSU 7 on its N end, and roughly perpendicular to it, is FSU 15, another stone wall running WNW–ESE, with up to five visible courses preserved. The stone blocks of FSU 15 (as well as those of FSU 7 and FSU 16, another stone wall) are fairly large (87 x 60 x 25 cm; 83 x 56 x 24 cm), cut rather summarily, and poorly aligned, which therefore suggests that they belonged to foundation courses. Two inscriptions in black ink were found on this wall, one on the first visible course from the bottom, near the corner between FSU 15 and FSU 7, and another one on the second course from the bottom. Both inscriptions seem to be in the same hand, mentioning two different names. A third inscription (identical in content to the second) was found on a stone of the first visible course of FSU 16, in the corner between this wall and FSU 15 (see report on Epigraphy and Papyrology). These inscriptions may all be dated to the Roman period.

FSU 16, roughly perpendicular to FSU 15 and parallel to FSU 7, ends near the western preserved end of FSU 8. Outside the corner where FSU 15 is bonded with FSU 16, two mud-brick walls seem to follow the same orientation as the two stone walls, one following part of the N side of FSU 15 and the other following part of the W side of FSU 16. FSU numbers 17 and 18 where assigned to these two very poorly preserved features. Interestingly, the bond of FSU 18
(headers alternated to headers on edge) seems to be the same as the bond of FSU 21. Another, very decayed mud brick wall (FSU 19), running parallel to FSU 17 to its North, was found but its true character (wall different from FSU 17 or part of it no longer in situ) has not been clarified yet.

FSU 7–8 and 15–16 form a rectangular structure including two mud brick walls (FSU 9 and 10) that run nearly parallel to FSU 8 and 15. They are quite well preserved, to a height of about 120 cm, and their foundation courses are clearly visible. Both are bonded with the stone wall on their E edge (FSU 7) and they are connected to each other through four smaller mud brick walls that run perpendicular to them (FSU 11-14). FSU 12 and 14 abut FSU 9, while, 11 and 13 abut FSU 8. These four walls, as well as FSU 9-10, seem to have been laid out at the same time on an artificial layer (DSU 11) of irregular, white limestone cobbles and sandstone chips (possibly deriving from the cutting of the stones of FSU 7, 15, and 16), and yellow, clean sand, which was used to fill in the spaces between these walls.

Several pits were identified, showing that the small mound is heavily disturbed. The largest (FSU 2) was located on top of and around the cluster of walls enclosed by FSU 7–8 and 15–16. This was perhaps originally dug in search for stone blocks to be reused in other contexts. Another pit was identified West of FSU 18, which had originally been dug through DSU 20, a layer of very compact mud-brick debris with many ash and charcoal inclusions and containing a lot of pottery sherds (some of which were sampled for ceramic analysis). Other pits are scattered in the area to the South and West of FSU 20. On the last day of excavation, another large pit was identified to the North of FSU 21, cutting FSU 1, 21, and 23 (a very poorly preserved wall, oriented NW-SE and running parallel to FSU 21). The pit was not excavated.

Two major collapse episodes were identified. DSU 6, along the western slope of the mound, and DSU 4, on the south-eastern slope, which seems to extend to a considerable distance from the top of the mound. DSU 4 seems to rest, at least in part, on a very thick, compact layer of mud brick debris (DSU 22), with pottery inclusions, which is also visible along the profile of the corner between FSU 1 and FSU 21. A trench was excavated in order to understand the nature of this layer, comparable to DSU 20, and it was possible to rule out the idea that it might represent another collapse episode.

Conclusions

The 2006 excavation season in area 4.2 brought to light an overall state of disturbance, reflecting a pattern visible throughout the temple area and particularly in the squares excavated in area 4.1. The nature and the function of the features excavated in such a context are difficult to interpret.

The walls uncovered on the top of the mound, all of which are foundation walls, seem to lie well below an original floor level. The earliest wall seems to have been FSU 8, which was later connected to FSU 21, seemingly contemporary to FSU 17 and 18. These walls might have been built as a sort of casemate, which included the three stone walls (FSU 7, 15–16) and mud-brick walls FSU 9–14. Such a compartmented foundation, including three stone walls, might have well supported a heavy, monumental structure, the function of which is as yet unknown. The evidence that was collected might support the idea of a northern gate in the temenos wall. Two very large pits, visible to the East and to the West of the mound, can explain the absence of visible sectors of the temenos wall in this area. The two collapsed walls (DSU 4 and 6) clearly belonged to a building of significant size that could belong either to the temenos wall or to the gate itself.

Another possible interpretation is that the casemate served as the substructure of the southern part of a separate, still monumental edifice, oriented N-S, in which the long mud brick wall (FSU 1) served as the East wall. Further investigation is needed in order to shed light on the nature and function of FSU 1 and its relationship to the other features revealed thus far. In particular, the excavation of the area to the North of the foundation walls might provide additional, useful information for the understanding and interpretation of the archaeological features uncovered this year.

Area 1.3

Area 1 clusters around the major east-west road in the north-eastern extent of Amhida. The structures in this area are primarily domestic and industrial in nature. This season’s excavations in area 1 were carried out in area 1.3, a domestic context that we began excavating in the 2005 field season. The 2005 excavations focused on three interconnected rooms, rooms 1-3, along the east side of the structure. They were excavated to floor level and clean sand. In the 2006 field season we excavated the remaining rooms, rooms 4-11, west of the previously excavated rooms. All of these rooms were excavated to the top floor level. Additional floor levels were excavated in rooms 5, 6, 7, and 9. Room 6 was excavated below floor level to clean sand.

Room 9
This barrel-vaulted room is located in the north-western extent of 1.3 and functioned as the entrance to the structure. It is L-shaped and measures 3 x 3 m. The room has two doorways; one leads north to the street, the other west into Room 7. The doorway contains two limestone steps leading up to the street, indicating that the street level was rising over time. Two floor levels were exposed. Rubble was used to prepare a stable surface for the second (top) floor layer. A wall stub was added east of the doorway to the street following the construction of the second floor level.

Object densities were low for room 9 and most derive from the rubble context between the two floor layers exposed this season. These include low densities of ceramics and slag.

Room 7

Room 7 is located east of Room 9. This unroofed room functioned as a courtyard area and the main axis for entering the other rooms in this structure. It provided access to rooms 1, 2, 5, 6, 8, 9, and 11. It is approximately rectangular in plan, measuring 2.75 x 6.20 m. The doorways show signs of heavy use-wear. A well-preserved floor layer was exposed during excavation. A section was cut in the northern half of the room to determine if there were additional floor layers. Three additional floor layers were found. An oven was exposed in the north-east corner of the room that was associated with the first (bottom) floor level. The upper floor levels were missing in this area. They might not have been added in this vicinity so that the oven could be accessed throughout the occupation of the house.

Most of the objects found in room 7 derive from the layer of collapse immediately above the floor and associated with the fourth (top) floor level. These include several complete or largely reconstructable vessels, including a lamp, jars, and bowls. Also associated with the fourth (top) floor level was an incompletely carved statue fragment representing a human form. A clay tablet inscribed with Greek was also found amid this collapse. An incised bone hair pin was found associated with the third (from bottom) floor level.

Room 11

Room 11 is a small sub-area located in the north of room 7, just west of the oven feature. It is a barrel-vaulted, rectangular space of the dimensions 1.25 x 1.25 m. The interior of the room is quite low and was probably used for storage. It was accessed through an aperture in the east of the feature. Rubble was placed above the barrel-vault to create a flat surface. A plastered channel rests on top of this rubble. The channel follows the south and east sides of this feature and probably would have continued along the north side. The rest of this feature is not preserved and its specific function is unclear although it was probably used for domestic preparation of food or liquid. No significant artefacts were associated with room 11.

Room 8

Room 8 was accessed from the middle of the three west doorways in room 7. This room functioned as a stairway to the roof of 1.3. A small hallway and four steps were preserved. The dimensions of this space are 0.85 x 1.85 m. No significant objects were associated with this context, but a high density of olive pits and other seeds were associated with the floor in the hallway.

Room 6

Room 6, vaulted in antiquity, was accessed through the southeast door in room 7. This small rectangular room measures approximately 2.7 x 2.8 m. The south and east walls have deep gouges and signs of heavy use-wear at floor level. Two floor levels were exposed here, both of which were in a poor state of preservation. Just inside the doorway to room 7 a wooden lid covered two large storage jars that were placed under the bottom floor level. In the process of removing these jars we excavated below the foundation level of the walls. It is clear that the natural slope of the hill was followed in the construction of the house walls because the foundation level was higher for room 6 than for room 3 (excavated in 2005) to the east.

Many complete jars and bowls were found in this room. Most of these vessels were associated with a layer of collapse and the top floor level. A palm-reed mat was also associated with the top floor level. This mat was consolidated and removed. A coin was found between the first and second floor levels.
Room 5
Room 5 was accessed through the southernmost west doorway in room 7. This unroofed, rectangular room measures approximately 2.5 x 4 m. Three floor levels were excavated in room 5. The third (top) floor layer is preserved only in the entryway into room 7. The second (middle) floor layer is visible underneath the third floor layer and also extends further to the west, where signs of burning are evident. The first (bottom) floor layer was exposed in the southwest quadrant of the room. It shows signs of heavy usage, particularly for fire-related activities. A hearth feature is associated with the bottom floor layer. A less formal hearth consisting of two charred mud bricks stacked on top of one another is associated with the third (top) floor layer.

This room yielded a large number of complete and nearly complete vessels. Most of them can be associated with cooking and many of them were blackened from use. This assemblage combined with the architectural and depositional data suggest that room 5 functioned as a cooking area.

Room 4
This room, vaulted in antiquity, probably functioned as storage space. Room 4 is rectangular in plan, measuring approximately 2.4 x 0.6 m. The ceiling height decreased towards the north, narrowing the vertical space. It seems likely that it was accessed through a doorway to the south from room 5. The inside walls of room 4 were mud plastered, but most of this plaster is no longer present except on the vault springing. The walls in the opening between room 4 and room 5 are rounded from frequent passage between the two rooms. The west wall shows signs of light burning, probably due to the use of oil lamps in this vicinity. A well-preserved floor layer composed of mud bricks was exposed.

The artefact densities for room 4 were low in all categories except for botanical remains, such as seeds and olive pits.

Room 10
Room 10 is rectangular in plan with the dimensions 1.4 x 0.7m. It probably functioned as storage space. It was probably accessed through an east doorway in room 4 that was later blocked with a wall. Mud plaster covered the walls of this room. This plaster was blackened to the south, probably from the use of oil lamps. No significant objects were associated with this room.

Summary
After two seasons of excavation it is clear that 1.3 served a domestic function. It is possible to determine the differential use of space through the analysis of architecture and associated artefacts. Food preparation and storage areas are particularly evident within this structure.

Area 3
On the 12th and 13th February, 2006, in concurrence with the restoration of the funerary monument in square Q67 known as the Pyramid (see the report on Architectural Conservation), we ran a short excavation at its south-east corner in order to interpret the extant structures before new walls, meant to strengthen the precarious ancient ones, covered them. We started off with the removal of the southern most chunk of the original corner already detached from the structure, revealing the top of a rather extended collapse made of mud-bricks fallen both from the façade and the interior of the building. We continued excavating the area removing the uppermost mud-bricks to uncover the lower portion of the collapse. While exposing the bottom layer of the fallen mud-bricks, it appeared evident that the foundations of the Pyramid were laid both on compacted mud and on natural bedrock, the compacted mud being used to flatten the sloping edges of the plateau. Of particular interest were the small remains of three walls still visible in situ below the collapse. Wall F1, oriented roughly North/South, is part of a series of structures dated to a later period and abutting the pre-existent pyramid. The outline of such structures is not reconstructable from the extant remains, but scanty traces of whitewash testify to the presence of plastered rooms. Wall F2, of which only 4 headers are still present, shares the construction technique and the orientation of the lower rows of the pyramid’s North-South façade, being thus probably part of the same wall. Wall F3, running East-West, is the less well preserved. Its northern face is on axis with the foundation bricks found at the western end of what is left of the southern façade. It is therefore possible that F3, bounded with F2, constitutes part of the lower courses of the original pyramid’s corner. Sometime after the collapse of the South-East corner, the natural bedrock was cut out to create a recessed space meant to fit the mumified body of what was probably a female individual. The burial was ransacked by animals and only one foot wrapped in bandage was still in situ. A large part of the body’s bones were found scattered on the site.
Topographical Survey

The topographical survey in Amhida started at the beginning of January 2006 with the checking of the grid set up in 2005. The work proceeded at the beginning of February and for the whole month with the survey of the extant structures, to enlarge and update the general planimetry of the site.

After a careful check of the whole area, it was clear that almost all the stakes placed during the previous season were still in place, except for some in area 4 and others in area 2, where they had been removed for excavation purposes and their replacement was therefore impossible. These stakes were repositioned and the existing grid in Area 4 enlarged to cover a larger sector North and West of what investigated during the previous seasons. This enlargement was mainly aimed at supporting excavation work in two sizable areas where limestone material and big block fragments, already noticed in 2005, were visible. (One of these is Area 4.1.)

The topographical work per se started only after the mapping had been completed. The main aim for this season was to fill up the gaps between the various areas that are now under archaeological investigation in order to achieve a more complete mapping of the site and have a firmer basis for the study of the urban character and development of the city.

The mapping tasks, performed with a Total Station Leica TCR705, started in the area between the South-West end of Area 1 and the North-East end of Area 2. By cleaning the top surface of the extant walls, it was possible to identify at least two new sets of dwellings oriented North/North-West, South/South-East. Those dwellings seem to be intrinsically connected with the urban grid of Area 1.

The surface cleaning of the dune North-East of Area 2 has allowed to identify an interesting building. This building is a rectangular structure partially preserved above ground and oriented East/West. The structure is characterized by columns, the bases of which are still preserved on the long flanks especially on the South one, and by the scanty rests of semi-columns located at the centre of the short East flank, and at the Eastern ends of the long flanks where such semi-columns are doubled. White plaster is still visible on all walls preserved above ground level, and fragments of painted plaster and several pottery sherds are scattered in the vicinities. This building seems to face onto a North/South oriented street that crosses at its northern end a main avenue. This avenue reaches the buildings in Area 1 via a sharp turn toward North/East. The main interesting features in the location of this edifice are its closeness to two other sizable colonnaded buildings located nearby to the west and the nearby villa in Area 2.

In Area 4, the main aim of the season was to define the outline of the temenos, already partially identified last year. The cleaning of the extant wall surfaces has allowed for the individuation of the North/West and South/West ends of the large enclosure wall. Moreover, it has become clear that the perimeter of this wall did not have a regular shape but rather a polygonal one. Despite the fact that numerous new data have been acquired, the definition of a general plan is still made difficult by the poor state of preservation of the structures still in place along the Eastern and Northern side of the hill, and by the peculiar shape of the temenos walls.

The top surface of the walls in Area 4 has been cleaned in order to define with a higher degree of precision the relation between the temple area and the lower urban grid. Although the structures’ state of preservation is lacking, it was nonetheless possible to identify the dense grid of intertwined rooms connoting the lower settlement. Unfortunately, none of the streets that must have connected the dwelling region with the temple have been detected yet.

Three new streets, two of which are oriented East/West, and the third one North/South, became visible after the cleaning of the sector immediately South/South-East of Area 4. These streets probably defined the eastern corner of an insula where at least one major dwelling, characterized by fine stucco decorations, niches, and large pilasters, is visible.

The updating of the general plan of the site reached the area South/East of the Pyramid. Here, the profile of some dried-out channels, and the outline of a pottery kiln and its dump have been surveyed. During this survey, several burials partly damaged by the water channels have been identified as well. Ten of them are clearly visible and still preserved in their structures.

The topographical work of the season also included work with the different excavation areas, mainly with the daily update of the planimetries and the plotting of the most relevant findings with the system of UTM coordinates. In Area 2 and Area 4, ground photogrammetry has implemented the knowledge of the extant archaeological situations. As for Area 4, the ground photogrammetry involved the shooting of the North/West stretch of the southern side of the temenos wall for about 23 m in length. As for Area 2, photographs of the painted plaster decorations in room 1, of the inscriptions on the East and West walls and of the complex ceiling collapse, both in room 15, will provide the basis for the proper photogrammetric restitution.

Architectural Conservation

Work was carried out from 11th to 26th February. Conservation interventions were made at two buildings on the site: the House and the Pyramid.

1. The Roman House
The temporary shelter built over the main space of the house was removed, and the loose brick screen walls around the interior were dismantled to allow for conservation of the wall paintings to proceed (see separate report). Examination of the mud brick structure of the building revealed that the walls have further deteriorated through damp infiltration and insect damage since last year.

New brickwork was used in the reinstatement of the missing south wall of the painted main room of the house. This followed the original brick dimensions of 8 x 34 x 17 cm but without the inclusion of straw/tibn (to avoid termite infestation). The existing bonding pattern was replicated where possible, although the original Roman brickwork is of a variable character with inconsistencies in sizes and coursing of bricks. Elsewhere, new mud brick blocking walls were built to divide the excavated from the unexcavated areas and to create a series of protected compartments within the area of the house to separate different areas in the backfill (see plan). The mortar used in the consolidation works was a mud mortar made from a combination of imported tafl, old crushed fragmentary bricks, and a small percentage of fly-ash (osromil).

The painted room was backfilled to its full height with clean sieved sand, and the temporary roof was reinstalled to act as a further deterrent to unauthorized digging. In the recently excavated schoolroom, another temporary roof was installed of jarrid on a timber substructure. Another blocking wall was constructed to protect the largest area of inscribed plaster, and two smaller blocking walls were constructed under the staircase.

Future work
The decision as to how much of the house should be reconstructed or consolidated is dependent on whether the structure is to be left accessible or backfilled after documentation is completed.

2. The Pyramid
Work was concentrated on consolidating the north-east and south-east corners of the pyramid, which had been seriously damaged by the penetration of robbers’ holes. These holes had caused the collapse of significant sections of the corners, leaving the remains in a highly unstable condition. Some clearance of the robbers’ holes was carried out to establish a secure base for new brickwork, but threat of collapse prevented a full excavation of these holes from being carried out. A limited excavation of the south-east corner revealed human remains, either present due to a secondary burial or to animal activity (see Archaeological Report on Area 3). An investigation of the large robbers’ shaft immediately to the south of the pyramid proved that this shaft is substantially blocked by fallen rocks, and that it would be hazardous to reopen it, as the rock is extremely friable in this area. This shaft was accordingly backfilled.

New bricks, matching the dimensions of the original Roman bricks but again without the inclusion of straw (to avoid termite infestation), have been used in the consolidation (8 x 17 x 35cm after cleaning and squaring up). The existing bonding pattern (English Bond of alternating stretchers and headers) was also replicated in the new brickwork. The mortar used in the consolidation works was a mud mortar made from a combination of imported tafl, old crushed fragmentary bricks from the collapse of the pyramid, and a small percentage of fly-ash (osromil). The line of the south face of the pyramid was established through excavation, while those of the north and east faces were still visible above ground level. The new brickwork was stepped to achieve maximum structural effectiveness, and severely wind-eroded bricks on the faces were replaced with new bricks wherever a secure bond between old and new brickwork was required. The brickwork was carried up to a height of 1m on the north-east corner, rising in the south-east corner to a height of 2.22 m which formed the base for the original angled setback of the pyramid. The setback itself was reconstructed to a height of 1.2m above this base line. A total of 5,000 bricks were used in the consolidation of this side of the pyramid.

Future work
Further limited consolidation of the upper part of the eastern, now stabilized, section of the pyramid is recommended. In order to permit archaeological investigation of the area at the base of the pyramid on its western side to proceed without risk in the future, further interventions are recommended. To preserve at the same time as much as possible of the original appearance and silhouette of the pyramid, it is suggested that a solid base be constructed to a probable height of 1.8 m. This will be built on secure foundation courses on the perimeter, but stepped over and built upon the existing collapsed brickwork to create a ‘belt’ around the base of this section of the pyramid. This should have sufficient mass to prevent structural collapse. It is not recommended to rebuild the entire structure to its original height owing to the known fragility of the bedrock and the risk of further collapse.

Future consolidation of other buildings on the site
Survey was carried out of some of the other standing structures on the site; two were particularly found likely to benefit from conservation treatment. These are a tower to the north near the village and an internally vaulted pyramid tomb in the southern necropolis. The various problems associated with these structures (failure of vaults / absence of lintels / missing brickwork / cracks requiring timber stitching) should be addressed as soon as the opportunity arises.
Plaster and Painting Conservation

Since the original survey work a quarter-century ago, it had been known that the reception hall of the villa in Area 2.1 retained outstanding mythological scenes (upper register) and architectural trompe l’oeil (lower register). In 2004, the reception hall was excavated. Mural paintings survived, in varying states of preservation, on all four walls of the room. Additionally, four very large collapsed blocks (on average 65 x 48 cm) retained important scenes in quite good condition. About 90 smaller blocks retained fragments of scenes and trompe l’oeil. More than 1000 painted fragments were collected and stored in 125 covered trays.

Each state of preservation of the murals, whether in situ on the walls of the villa, on large blocks, on small blocks, or as fragments, has created various conservation problems. The nature of the conservation problem and the treatments carried out in 2006 are as follows.

1. Mural Paintings In Situ in the Villa.
In 2004, the murals were conserved through ‘minimum intervention’. After cleaning, they were sprayed with a 4 percent solution of Acryloid B72. Unstable borders were strengthened with Hydroseal (75 percent). Very unstable areas were supported with facings made from crepaline or tissue and adhered with Acquazol. Many borders were further supported with mud mortar.

During 2004, it was confirmed that the lower half of the walls are quite wet and thus subject to efflorescence of salts and other agents of deterioration that use water as the vector. Following treatment in 2004, the murals were backfilled by erecting a wall of mud bricks parallel to the paintings and filled with sand as the insulator. In 2005, the walls and backfill were adjusted, and a timber and jarrid roof was placed over the room to deter visitors.

In 2006, the backfill and the roof were removed. It was found that the backfill system and roof did not act as complete barriers between the murals and the very harsh environment of the room. Additionally, the lower half of the room remains wet and subject to extreme efflorescence of salts. Another unexpected conservation problem is termites (or termite-like) insects that have tunnelled into the some areas of the murals.

During 2006, the insects were controlled by hanging bags of mothballs on the murals and by covering the murals, with mothballs hung under the covering. Unstable areas of plaster and paint were retreated using the materials and techniques employed in 2004. At the conclusion of the 2006 season, the room was fully backfilled with clean sand.

2. Large and Small Blocks
The figural scenes from this room are quite difficult to treat because they are thinly painted on a thin white ground that is poorly attached to the mud mortar. The refractive index of the white ground and paint can be permanently altered to beige with most convention materials of conservation. In 2005, the author and Prof. Richard Wolbers, University of Delaware, carried out several experiments whose goal was development of treatments to remove the murals safely from the blocks without changing the tonalities of the colours. A removal system was developed that utilizes cyclododecane as a rigid facing. Once applied, the painted surface can be mechanically detached from the block and then placed in Conservare OH, an inorganic ethyl silicate-based consolidant. Over several months, the cyclododecane will evaporate away. In 2006, all the painted blocks collected in 2004 were treated in this fashion.

3. Treatment of the Fragments
Each of the 125 trays of fragments were examined, cleaned and all pieces sorted by colour and form. In 2005, Helen Whitehouse had reconstituted several scenes from fragments and had initiated a data base for the trays of fragments. In 2006, other scenes were reconstituted. A data base was completed for the trays of fragments, including overall and detail photographs of each tray. The trays are now stored on annotated shelves that relate to the database.

Geophysical Survey

After the extensive magnetic survey in previous seasons, the two geophysicists carried out in this season a conductivity survey of the site. Two days were also spent on conductivity and magnetic measurements on the neighbouring site ‘Ain el-Gazzareen to compare the results obtained on both sites. The method of conductivity survey of archaeological sites is to measure conductivity of the earth point by point with a small step (not more than half a meter), close to the surface, and present the measurements on the conductivity maps.

A co-ordinate system was set up on the site for data collecting. There were plots 40 m wide and as long, as it is necessary to cover the area of this or those part of the site. Small wooden sticks were put each metre along two opposite sides of the plot and 40 m-strings with meter marks were used between the sticks. The conductivity survey has been carried out with EM38RT ground conductivity meter from Geonics limited GSM-19WG (Ontario, Canada). The measurements were made along straight and parallel lines (strings with meter marks); the space between the lines was 0.5 m. The distance between the measurements along the lines was 0.5 m. The height of the conductivity meter above
the surface of the ground was about 0.2 m.

The data were stored in the memory of the instrument; after the survey they were transmitted to a portable computer. Two different presentations of the magnetic data were prepared with help of Surfer software (Colorado, Golden): coloured contour maps and grey-scale maps. On the contour maps the positive anomalies were marked with blue colour, negative ones - with red colour. On the grey-scale maps the positive anomalies are marked with dark colour, the negative ones – with light colour.

To measure electrical resistivity of mud bricks, soil etc., we used a resistivity meter of the German firm Gossen in a four-electrode mode.

First of all, the area of the site was inspected with help of the ‘free search’ method. This means that the electrical conductivity has been measured with a step of about 1–1.5 m without any grid. On the whole territory of the site only two areas with high conductivity anomalies have been found – on the Temple hill and around the Pyramid. There are also local conductivity anomalies on the area close to the road. On the quarters of the Roman town the conductivity measurements are low and almost constant, see for example, Area 2. Therefore we decided to carry out detailed conductivity measurements in Areas 3 and 4 (Pyramid and Temple).

**Area 4. Temple Hill**

Magnetic survey was carried out on a large area of Area 4 in 2000. With the help of magnetic survey it was possible to reveal a large rectangular structure, the sizes of which are about 108m x 56 m in the central part of the hill. The orientation of the short axis of this structure is about 37 degrees from a northern direction towards the east.

It would be possible to interpret this rectangular structure as an enclosure, which is earlier, than the Roman Time buildings on the site. It is very interesting, that the neighbouring Early Dynasty site ‘Ain el-Gazzareen, which was investigated in 1999 and 2000 with help of magnetic survey, has almost the same dimensions and orientation of the walls. The dimensions of the enclosure in ‘Ain el-Gazzareen were approximately 112 x 54 metres, and orientation of the walls was about 25 degrees from the north towards the east.

The conductivity survey has been carried out on a quite big area. The results are presented as colour contour maps and as a grey-scale map. One could see that there is a big and quite complicated structure, consists of several rectangular blocks and two round structures. The material of this structure is more conductive for the electric current, than Roman mud brick walls. Therefore one could observe the high conductivity anomalies over the ‘early’ mud brick walls and the ruins of them. The hypothesis is that there was an earlier settlement on the Temple Hill, and we can see the contours of the enclosure walls and some inner walls. The extension of these positive conductivity anomalies gives an extension of the an early settlement.

One could suppose that in the Old Kingdom people used the clay from spring mounds and may be a special technology for preparing mud bricks for their constructions. The clay was different with the one, used later in the Roman period. It is a very fine clay, inreached with different minerals and iron hydroxides. For this reason, mud bricks of the Old Kingdom have high electrical conductivity and can be seen on on conductivity maps as high readings.

We have checked the electrical resistivity with help of Gossen resistivity meter of the Roman mud bricks, visible elsewhere in the town quarters and possible ‘early’ mud bricks, which are exposed at the excavations on the Temple hill and we came to a conclusion, that the Roman mud bricks do not conduct any electric current, while the possible ‘early’ mud brick have rather low electrical resistivity, or, which is the same, high electrical conductivity.

One of the most interesting feature, which has been found on the Amhida Main hill, is a strong magnetic anomaly on the top part of the area. The value of the anomaly is +100 and - 60 nT, the area occupied by it is about 10 x 10 m. It could correspond to a very big kiln (?). In any case, this is a big mass of hardly fired clay.

**Area 2 - South-of the Roman villa**
The magnetic survey has been carried out on the big area south of the Roman Villa, but there are almost no anomalies of electrical conductivity there.

**Area 3 – The Pyramid**

Another area with high conductivity measurements, as we already mentioned above, has been revealed around the Pyramid. The detail conductivity measurements has been carried out on a quite big area, including slopes and lower flat area to the east of the Pyramid. One could see, that there are high conductivity measurements on the rectangular area with a Pyramid in the centre and there are two anomalous zones to the north-east and south-east of it. One could interpret these anomalies as structures (may be earlier, than Roman structures), which we built in Pre-Roman time. We would like to emphasize, that there are underground structures not only below the pyramid and around it, but also on the southern and northern-eastern slopes of it, and may be also on the low flat area east of the pyramid.

**Possible Pre-Roman pottery kilns near the road**

Area 4 has been revealed with help of ‘free search’ conductivity survey: several quite strong anomalies has been found there. It is situated at the southern-eastern part of the site, close to the modern road, near two natural hills (see Figure 46).
The epigraphic work at Amhida concentrated on the recording of the blocks of temple decoration found in area 4.1. Some 50 blocks were recorded and drawn onto plastic. As a result of this season the history of the temple from the Roman period can be described with more accuracy. New reliefs were found from a chapel that can be attributed to the reign of the emperor Titus. These are mainly blocks belonging to a register at the lower part of the wall (the soubassement), with a row of male and few female fecundity figures. Some parts of thrones and other parts of reliefs in a large scale were also found, with life-size figures, belonging to this phase of the temple, which was executed in a raised relief. One of these is the head of a large baboon set in a chapel, the sacred animal of the god Thoth.

Some blocks found during 2005 can now also be attributed to the reign of Titus. Very few reliefs from the chapel decoration of Domitian were found this season, which demonstrates that there is still a relation between the original architecture of the temple and the current find spots of the blocks. The chapel decorated under Domitian must have stood to the north of the chapel decorated under Titus, which may have been the principal sanctuary of the temple. Further research is needed to confirm this hypothesis.

Other blocks appeared with a different style of sunk relief from a doorway set into a wall and decorated later in the Roman period, probably during the later half of the second century CE. These blocks are separated from the findspot of the larger part of the Domitian and Titus reliefs by a series of column segments, probably indicating a former hypostyle hall.

A limited number of blocks, not more than nine, was found that belong to earlier temples and that had been reused in the Roman period. This percentage of reused fragments is lower than that found during the previous season. One of these earlier reliefs shows the bodies of two goddesses in a high quality sunk relief that can be attributed to the 26th or 27th dynasty. No cartouches with royal names from earlier periods were found during this season.

In addition to the relief blocks, two hieratic ostraka were found in the temple area dating to the Ramesside period. The best preserved of these can be identified as a school exercise of a pupil, giving a text of a didactic nature.

The 2006 season produced a variety of objects (other than temple blocks) bearing writing. Among these were about 100 ostraka in Greek and a few ostraka in Demotic and Hieratic. The types of contents of the Greek ostraka were largely familiar from the ostraka of the two previous seasons. Many of the tags bearing the names of wells with which we have become familiar continued to be discovered. Another instance of such a tag embedded in a jar stopper, combined with a larger find of similar ostraka in stoppers at Kellis in this year’s season, makes it clear that these little tags were all used as labels on jars, mainly if not entirely of wine. Another highlight of the 2006 ostraka was inv. 11198, containing a rather faded few lines containing the names of three colours, found in Room 9 in Area 2.1.

In the newly opened Area 4.2, the stone foundation blocks revealed at least five instances of individuals having signed their name and patronymic on the top of a block, in a position such that the writing must have been invisible once the next block was laid (see the report for Area 4.2). Four of the five were of the same individual, Petosiris son of Tithoes; of these two were intact and two surviving only in chips of stone. The fifth was of Peteneophotes son of Petosiris.

The year’s most remarkable discovery, however, was the extensive writing in red paint on the walls of Room 15 in Area 2.1, parts of which were well preserved and other parts washed out (apparently deliberately in antiquity) or lost to the fall of plaster from the walls. These contained a series of short poems, epigrams in effect, written in elegiac couplets. Some of them bear indications of the persons to whom they were addressed – in the main, the students of the person who wrote them. The themes suggest a school in which the writing of rhetorical compositions in verse was taught, and the writing includes various aids to the students in their composition of such verses, with accents, breathings, long marks, and indications of caesura in the meter. The nearest parallels are teacher’s models on wooden
boards, although those are much smaller; the themes are found in fourth century teachers of rhetoric like Libanius and Himerius.

**Pottery**

This season saw the completion of the recording of the ceramic material from the 2005 excavations. The sherds from the 2004 excavations in areas 1.1 and 2.1 were labelled, and most of the latter group catalogued and drawn so that they could be integrated into the current system of analysis of the pottery from Amhida. This ceramic material was found, not surprisingly, to be of the same nature as the pottery from the contexts of 2005. It was decided that as the pottery from area 1.1 could not be directly related to that of area 1.3 the similarity between the two assemblages would simply be assessed.

Pottery was collected during the excavation of the same three areas that were opened in the 2005 season, and a few sherds were also collected in the vicinity of the pyramid. The ceramic material was sorted on site, recording for each unit the total weight of the sherds of each fabric, in order to study the proportions of each fabric and for what types of vessel they were used. Within each fabric group, the number of diagnostic sherds (rims, bases, handles, spouts) of each broad vessel shape was noted. A policy of discarding bases, handles and small, worn or damaged diagnostic sherds was introduced in this stage of the analysis to speed up the sorting and cataloguing processes. The remaining diagnostic and other interesting sherds were kept for further analysis and as a record of what was found in each depositional stratigraphic unit (DSU). Full recording of the diagnostic sherds continued in line with the established DOP system, in order to compile a catalogue of types for each site, with a record of where these types were found and the frequency of their occurrence. Additions were made to the catalogues compiled for each area in the 2005 season.

All of the ceramic material from Area 1.3 was fully recorded, new types drawn and the most complete vessels photographed. The pottery from this area is consistent with a late third or early fourth century date, perhaps slightly earlier than that of the higher status house (Area 2.1), and with the domestic function proposed for this house structure. Significant in situ floor deposits were found in rooms 5 and 6, consisting of a range of intact and reconstructable coarse ware vessels in an A1 fabric, including simple and carinated bowls (some with red dot or tick decoration on the rim top), large jars and lids. Two large closed vessels were also discovered sunk below the floor in the north east corner of room 6. Room 5, an open courtyard, contained a number of vessels that were burnt or blackened, including several so-called fire-dogs, possibly used to support cooking pots.

A sample of DSUs from Area 2.1 was fully recorded, but the finding of large and significant contexts from both room 9 (DSUs 127 and 151) and room 15 (DSUs 152 and 157) meant that completion of the analysis of the pottery from this area was not possible this season. Both of these rooms were apparently outside the main house structure. Room 9, perhaps an open courtyard, contained a large circular mud-brick structure, the fill of which was designated as DSUs 127 and 151. These units contained a vast quantity of sherds of a relatively small size, between which few joins could be made. This suggests that the ceramic material does not represent an in situ domestic assemblage, but was dumped inside the structure either opportunistically or for a specific reason, in which case it is likely to have been brought from elsewhere at Amhida. While it was not possible to record the pottery from these DSUs during the 2006 season, a preliminary assessment of the material was made. This consisted of laying out all of the diagnostic sherds from each DSU and recording the number of sherds of each type in order to summarise the composition of the assemblage. The most frequently occurring vessel types in these DSUs are simple bowls (27% of rim sherds), long-necked jars (8% of rim sherds) and jars with a shorter neck and thickened or turned down rim (10% of rim sherds). While other forms, such as lids and flasks, are present, they do not form a significant component of the assemblage. The reason for this predominance of a restricted number of vessel types is not yet clear.

Room 15 contained a possible floor deposit, the pottery of which was concentrated in the north east corner. It is not clear whether all of the pots were in situ on the floor surface, or were in fact associated with a roof deposit and fell to the ground when the roof collapsed. The room was gridded into six squares of equal size in order to preserve the spatial relationship of the objects and pottery, which was excavated in two arbitrary DSUs. Complete or significant portions of vessels were allocated a field number and their position recorded on the plan of the room. The ceramic assemblage seems to be slightly different to, and less varied than, that in the rest of the high status house. The most frequently occurring forms are simple small bowls, large ledge-rimmed bowls with interior red-painted decoration and jars with long necks and wide rim diameters, the latter often in a P37 fabric. There are also a number of flasks and large jars/amphorae in a coarse A11 fabric with a cream slip. A small but consistent quantity of late Roman amphora (LRA) 7, an import from the Nile valley, was also found, including both diagnostic and body sherds. A few fragments of Rhodian amphora (late fourth century BC to early second century AD) were also found in this DSU. Noticeably absent are more complex bowl and jar forms and legs. The shoulder of a LRA 2 amphora was also found in the vault collapse (DSU 178) of room 18.

The excavations in the temple area were divided into two parts, the first being the continuation of the investigation of the pitted area designated as Area 4.1 in the 2005 season, the second (Area 4.2) being a mound to the north of the previously excavated area. Area 4.2 was excavated to investigate the theory that it might be the temenos gate on the
basis of a scatter of a large number of limestone chips, mortar and subsurface stones. The excavations revealed founda-
tions of various mud brick and stone walls constituting the substructure of a possible monumental feature. The surface and sub-surface pottery in this area was of the same character as that of Area 4.1, consisting mainly of fourth century types similar to those in Area 2, but with a few recognisable early Roman (Eastern *sigillata*, Barbotine) and dynastic vessels. DSUs 14 (collapsed mud brick wall) and 19 (sand fill of pit F20) were distinguished by their high component of Late period sherds, particularly jars with thickened rims and baggy shoulders, dimple bowls and a bread 
tray. The substrate into which pit F20 was cut (DSU 20) was sampled for diagnostic sherds, which were found to be predominantly Late period to Ptolemaic period in date, including fragments of a bread tray, a body sherd of a polished 
ware bowl with a fugitive red slip, a so-called goldfish bowl and a calcium rich bowl of this date range. Sherds of other 
periods were also present, such as the rim of a basin thought to be of the Middle Kingdom to Second Intermediate 
period, and the rim of an Old Kingdom conical bread mould.

The composition of the surface material in both Areas 4.1 and 4.2 was extremely mixed, spanning the Old Kingdom to the fourth century. The part of Area 4.1 excavated this season was distinguished from that of 2005 by the lack of New Kingdom bread moulds. It was noted that Old Kingdom single and double bread moulds, some with simple incised motifs, were particularly abundant in DSUs 61 (subsurface in AP50-AQ50), 72 (windblown sand below DSU 61) and 86 (fill of pit F11, mainly characterised by collapse of sandstone blocks), and many conical bread moulds were found in DSU 99 (subsurface in AN 50). DSU 73 (lowest level of fill of pit F27, possibly associated with the substrate into which it was dug, DSU 100) was found to be entirely composed of dynastic sherds, including a large number of single and double bread moulds.

An extremely deep pit (F32), the bottom of which was not reached after 3m, in the south east of the excavated area produced a stratigraphic sequence. Sherds were collected from DSUs 94-7, upper levels of the substrate into which pit F32 was cut, containing occupational or dumped material. These indicated that the entire sequence contained ceramic material of the Old Kingdom, consisting of fragments of polished ware bowls and conical, single and double bread moulds, the latter group including a body sherd with an incised motif known from the 2005 season. *In situ* vessels at a high level in the surrounding area included large coarse basins that perhaps date to the Second Intermediate period (DSU 95), and a blackened bowl in a nearby wall collapse (DSU 93) with a stubby knob handle.

Pottery was also collected at the pyramid (Area 3.1) during its conservation in this season. Material from a small surface survey was of fourth century date. A small sherd of a silt *sgraffito* bowl, of a style consistent with finds at the Delta site of Tell Tinnis dating to the Ayyubid period, was found on the east slope leading up to the pyramid. A tiny glazed ware sherd was among the surface material from Area 4.1 and part of a white-slipped frit ware lid was found in a wall collapse (DSU 4) in Area 4.2 this season.

**Archaeobotany**

During this season, archaeobotanical samples from three areas of the site were analyzed, Areas 1.3, 2.1, and 4.1.

A total of 32 matrix samples were taken. Of these, 22 came from Area 1.3, including some samples from the 2005 season, 8 from Area 2.1, and 2 from Area 4.1. These show a similar plant assemblage to that found last year. Because of the better preservation and lower humidity in Area 1.3, a higher percentage of desiccated plant remains and a greater variety of plant species are found in Area 1.3 compared with Area 2.1.

The cereals include bread wheat, hard wheat, and barley. Emmer wheat was found in high quantities only in the temple area 4.1. The woody garden plants are represented by the common species: grape, olive tree, date palm, fig, and rarely peach. Several field crops and herbal garden plants, such as lentil, flax, cotton, safflower, coriander, rosemary, and black cumin occur in the samples. Weeds are represented by grasses, members of the pea family, such as clover, vetch, medick, along with mustard, asphodill, mallow, marigold, sea-blites, sea club-rush, and nettle-leaved goosefoot. Acacia and tamarisk occur in most of the samples. Dung was also found in some samples, occasionally in high concentrations.
Figure 28
Figure 29  Area 2.1, Room 9: Circular feature F93 and gypsum floor F88 during excavation.

Figure 30  Area 2.1, room 15: floor level with baked brick piers and beam holes in the south partition wall.
Figure 31   Area 4.1, north part of AP50, aerial view.

Figure 32   Area 4.1, FN 31, Cavetto cornice, in situ.
Figure 34  Area 4.2, view from above, facing W.

Figure 35  Area 4.2, view from above, facing S.
Dakhleh Oasis Project

Figure 36.

Figure 37  Area 1.3, overview of the house.
Figure 38  Area 1.3. The oven in Room 9.

Figure 39  Area 3, S-E corner of the Pyramid.

Figure 40  Area 3, S-E corner’s collapse of the Pyramid.
Figure 42.
Dakhleh Oasis Project

AMHEIDA ◯ ROMAN HOUSE

New mudbrick blocking walls constructed 2006
New temporary timber and jarrid roof
Areas backfilled in 2006
Unexcavated areas
South face of Amheida Pyramid pre-consolidation

Photogrammetric drawing pre-consolidation

Post-consolidation February 2006

AMHEIDA PYRAMID
Fig. 2. 12-21.01.06. Amheida. Temple Hill.
Conductivity survey. Contour interval 1 mS/m. cale 1:500

Figure 44
A Sandstone Quarry in central Dakhleh Oasis

During the course of surveying for ancient lake shoreline evidence, a sandstone quarry was discovered. It lies in an area some 2 km south of the village of Massara, above the oasis cultivation floor. From the appearance of the quarry faces, this is a quarry which was used for temple blocks. There are four sandstone temples within a reasonable transporting distance – Ismant el-Kharab temples of Tutu and of Neith, a temple at 'Ain el-Azzizzi of unknown ascription, and the temple of Seth at Mut el-Kharab. Each of these temples is within easy walking distance from this quarry.

There are several prehistoric sites in the area of the quarry and one Neolithic petroglyph. Otherwise, there is no sign of any other ancient activity in the area.

There is a series of low sandstone hills and a few isolated inselbergs. It seems that wherever there was a suitable vein, the stone was taken out. The working is all open-face and no underground works were seen. At each worked area there is a large area of rubble and tailings, downhill from the quarry face. From the configuration of the work faces, both round column drums and square/rectangular wall blocks would have been extracted. A preliminary estimate of the amount extracted from this quarry is 120,000 m$^3$, which would have almost enough to build a small temple such as that at 'Ain Birbiyeh.

It is proposed that a survey of the entire quarry and some excavation will be necessary in order to come to a fuller understanding of this ancient industry.

CONSERVATION OF ANCIENT SITES

‘Ain Birbiyeh Temple of Amun-Nakht

During the season we completed our work in the eastern Gateway, we continued excavating into the Sanctuary and the Contra-temple, the two remaining decorated areas of the temple, and into the western end of the south corridor.
The areas investigated and conserved this season were:

**The Eastern Gateway**

This gateway had been found during a geophysical survey and testing by excavation had confirmed its existence. Initial excavation began last season and during the 2006 season we completed our investigations at this part of the site by excavating to the floor. Only a part of the flooring was exposed due to a very large block which had fallen into the centre of the gateway. The structure was quite undecorated and it was felt that a complete clearance would provide no useful additional information. The structure is considerably larger than the inner, ‘Augustus’, gateway (which was decorated), and is built of rather larger stone blocks than elsewhere in the monument, but is of the normal configuration with a pier of the usual shape on either side of the Processional Way. The flooring at the eastern end of the gateway consisted of two very large limestone flags, which filled the entire space east of the niches. These blocks must have come from a considerable distance, although they may have been taken from ‘Ain Aseel, a nearby, much older Egyptian site. In any case, limestone is an unusual material for temple buildings of the Roman period in the Dakhleh Oasis. Evidence for the location and opening of the doors was seen and these must have been some 80 cm inside the eastern façade of the gateway and opening inwards. The evidence was in the form of the hinge-point holes in the floor and scrape marks on the inside step.

Having established the architectural details of the eastern gateway, it was decided to proceed no further with this part of the site. It will be refilled next season, following the taking of a latex squeeze of a long Greek inscribed graffito on the western face of the north pier.

**The Sanctuary**

As will be seen in Zielinski's report, below, the condition of the walls deteriorates the lower in the monument we reach. It became necessary at the beginning of this season's work to install a support system of heavy timbers in order to make the lower parts of the chamber safe. Excavation continued slowly, after two further heavy stones were removed by a crane from the local council, and we now suppose that we are about one meter above the Sanctuary floor pavement. The fill throughout has been largely sand, with a large number of block fragments.

**The Contra-Temple**

This part of the temple of Amun-nakht lies directly behind the west side of the Sanctuary, and is centered on the Processional Axis. It is accessed from outside the main temple, in this case via corridors on the north and south sides of the temple building. One of the main reasons for excavating in the western end of the south corridor was to find out the access into the Contra-temple. The east wall of the Contra-temple was decorated with the usual rows of uraei and stars beneath which are the large figures of Amun-nakht shown in the same pose as in the inner Gateway. He had outstretched wings which were inlaid with various materials, and strikes an aggressive pose. It is probable that he is accompanied by his consort, Hathor, but this figure has yet to be revealed.

This wall is in particularly poor condition. There is a large hole towards the north, which may be due to a collapse or to human intervention. A course at the level of the breast of the Amun-nakht figure was almost completely disintegrated and our excavation had to cease at that point and a shoring of sand and brick was installed. No further excavation below this course will be undertaken. There were water spouts in the form of lions, one on either side of the main scene. These both had to be removed as they were unable to stand in situ. At the south side of the Amun-nakht figure is a pilaster some 5 metres high, which seems to have been built after the temple wall was constructed. The west face of this is decorated with well-cut hieroglyphics, some of which still retain traces of their colour. This pilaster was excavated down to a stone floor, but this may not be the ultimate floor of the Contra-temple as it seems to be about a metre higher than others nearby. The western enclosing wall of the contra-temple has yet to be properly ascertained.

**South Corridor, west end**

We excavated into the end area of the south corridor in order to ascertain whether walls in the corridor were decorated and to discover the relationship of the corridor to the Contra-temple. The fill of this small excavation area was chiefly burned clay mixed with the debris of a living structure – pottery, bronze, and other objects. The walls were burnt and blackened, the result of fire. The evidence does not seem to indicate the normal temple activities and it is difficult to understand this phenomenon. One interpretation is that there was a domestic house built over this end of the corridor, perhaps in the 5th or 6th century, which was destroyed by a fire and collapsed into the corridor which had been retained as a cellar.

The objectives of this small investigation were met. There were no decorative carvings, nor even graffiti, on the walls of the corridor; and a small doorway was discovered, complete with blocked-out cornice and jambs, which led...
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directly into the Contra-temple. This doorway, at the north side of the corridor, was also in deteriorated condition and required structural engineering to ensure its safety.

Mr. Zielinski's conservation report is as follows:
In the course of our 2006 season in the Temple of Amun-nakht at Ayn Birbiyeh, we continued working in the west part of the complex. The work concentrated in the Sanctuary chamber, Contra-temple are and south corridor at Contra-temple.

The condition of lower parts of walls, both exterior and interior becomes markedly worse at the depth of about 2.5 m below the tops of existing walls. The temple masonry is typical Pharaonic dry masonry, where stone blocks are placed in the wall without mortar. Each block acts as an individual load-bearing element.

Walls exposed in the Sanctuary chamber include blocks that are displaced, cracked or damaged by long exposure to rising damp. In order to preserve the existing walls and to improve the safety, new masonry infills and supports are installed as the exposure progresses. As an additional measure, we installed horizontal braces, manufactured from heavy timbers. These are designed to prevent further horizontal displacement of north and south walls. The exposure of much of the exterior face of the west (back) wall came to a halt when the removal of exterior clay fill revealed deep voids in the wall face, where entire blocks of stone simply perished and were replaced by sand and clay. A small side door was found in the side wall of the Contra-temple. As in the other parts of the complex, the door opening is damaged, with its lintel cracked and door jambs distorted. To prevent further damages to the masonry a set of heavy timbers and steel reinforcing bars were used to stabilize this part of the structure. Lime mortar infills are (were) installed where the parts of original stone blocks are missing. This is done to ensure load transfers within the wall. A separate work is the consolidation (hardening) of exposed decorated surfaces of walls. Removal of sand infill from the sanctuary enabled the recovery of a substantial volume of wall blocks and fragments of blocks from decorated faces of the chamber. All recorded material undergoes hardening and cleaning treatments.

Prof. Kaper's report on this season's epigraphic recording is:
The ongoing excavations at Ain Birbiyeh of the sanctuary and the contra temple produced much more epigraphic material. The walls of the sanctuary can now be described in more detail, because the general layout of the decoration is now clear. As in Deir el-Hagar, the north, west and south walls each have two registers of offering scenes, bordered above and below by horizontal bandeau inscriptions. At the bottom was probably a scene of fecundity figures, but this part has not yet been exposed. The emperor in whose name the decoration had been made, is named in seven different cartouches found thus far. Unfortunately, even though the reading of the cartouches is clear, the name of the emperor can not yet be established beyond doubt. It is thought that the name refers to the emperor Commodus who ruled at the end of the second century CE.

On the rear wall of the sanctuary are four offering scenes in which the emperor offers to the gods Amun-nakht and Hathor. On the side walls Amun-nakht is depicted in the company of various other deities. On the northern wall, the newly exposed first register depicts Amun-nakht followed by the gods of Thebes: Amun-Re, Mut, Khonsu and another goddess, possibly Hathor. On the opposite register upon the south wall, the excavations have revealed a scene of the gods of Panopolis (Akhmim) in the company of Amun-nakht. They are Min-Re, Amun-nakht, Horus, Triphis and another goddess, possibly Hathor.

The doorway into the room was decorated on its inner reveals in sunk relief. On the southern side the so-called 'shadow-of-the-door' pattern appears, with ankh and w3s signs set upon baskets. The decoration upon the northern reveal is not yet apparent. The lintel over this door was decorated on its inner face with a large scene of two squatting fecundity figures tying the plants of Upper and Lower Egypt around a stem (a scene of smA-tAwy), upon which Amun-nakht is depicted in the form of a falcon. No inscriptions were present upon this scene, which is rare because of the squatting posture of the gods. The larger part of the scene was found upon a loose block that had fallen into the sanctuary fill.

On either side of the doorway were images of the two Meret-goddesses, as at Deir el-Hagar, placed within the second register. Beneath them were scenes of the emperor being received by Amun-nakht. Only fragments of these lower scenes have survived.

In the contra temple, the large figure of Amun-nakht upon the central section of the back wall of the temple was further revealed, but no more legends were found with it further down, even though the parallel scene upon the Augustus gateway had inscriptions beneath the wings of the god. On the southern side wall of the contra temple another image of the winged Amun-nakht was found, painted directly upon the stone and later plastered over. The painting is now badly preserved, and no text remains with it. It is remarkable that the god is oriented towards the temple, in a reversal of normal practice.

To the south of the principal relief image inside the contra temple a buttress was added which was fully covered in relief decoration. At the top is an offering scene showing a pharaoh figure, presumably the emperor Titus, offering a
field symbol to Amun-nakht. The legends give the names of the two figures, but the titles of the god are faulty. Beneath this scene is a triple column of large scale hieroglyphs, the largest of which measures 20 cm in height, with much remains of colour in its upper part. The text describes Amun-nakht and mentions the emperor responsible for the decoration of the contra temple, probably Titus, whose name is preserved in the adjoining scene on the rear wall. The text stands out for its faulty orthography, as in the other inscriptions on the wall. The scribe responsible for its design regularly confused signs belonging to different words and phrases, and it may be taken as an indication of the diminishing role of hieroglyphs in this late phase of the development of the script.

A preliminary transcription and translation may be given as follows:

Line 1: Horus Amun-nakht the great god, the lord of Imeret ('Ain Birbiyeh), great of strength, who overthrows the enemies that are in the oasis. living ---

Line 2: Victorious Horus who hears, the temple of Kenmet (? the Southern Oasis) ... the enemies ... when they (attack his) father Osiris. who pleases the heart of Wennefer ---

Line 3: (who destroys) his towns (i.e. of Seth). His son whom he loves, the king of Upper and Lower Egypt, the Lord of the (Two Lands, Titus), the son of Re, Lord of appearances Caesar, who lives like (Re) for ever. He has made ---”

El-Qasr

The report of Prof. F. Leemhuis follows:

**Report on research and restoration activities Season 2006**

- Research and excavation in al-Qasr.
- Conservation, restoration and reconstruction of private houses in al-Qasr.

The fifth season of the Qasr Dakhleh Project (QPD) has been interesting and successful. Administrative matters with the Supreme Council of Antiquities (SCA) were fast and efficiently finalised and work could start immediately after al-'Id al-Kabir on 14th January. The progress of the reconstruction of Bayt al-Qurashi was much advanced by the permission to start the necessary production of mud bricks more than a month before the beginning of the reconstruction proper.

In the 2006 season the activities again consisted of two distinct, but not completely separate parts. The research activities, which included excavation, were mainly funded by the University of Groningen, and for the restoration and reconstruction activities a generous grant was received from the Netherlands Embassy in Cairo. Also from the contributions of Vodafone Egypt to QDP's umbrella organisation, the Dakhleh Oasis Project, part of the costs of the QDP were paid. All these contributions are very gratefully acknowledged.
Research

The research activities consisted of three parts: completion of the study of Bayt al-Qurashi, continuation of the research into the material found in Bayt al-Qurashi and the study of the early history of the habitation of al-Qasr.

Figure 1  Plan and room numbering of the first floor of Bayt al-Qadi, Bayt al-Qurashi en Bayt Al ’Uthman.

Figure 2  Remnants of stair south of BQur 8b.
1. Completion of the clearing of Bayt al-Qurashi.

Even now, with only a little part left to be cleared out, Bayt al-Qurashi was good for another little surprise. At the beginning of the reconstruction of room BQur 8b (Figure 1) it became clear that the wall which separated BQur 8b from the passage way to BQur 11 was not original. Moreover, when the space was cleared out the lower steps of stairs south of BQur 8b appeared (Figure 2). Further investigation led to the conclusion that the space which now is indicated by BQur 12 contained the staircase to the first floor of BQur 8b and to the built-in filing cabinet BQur 11. This was indirectly confirmed by the find of a number of fragments of documents clearly belonging to the same collection as those which were found in previous seasons. Like the documents of previous seasons these fragments were rehydrated and put between glass by Vreni Leemhuis-Obrecht.

2. Continuation of the research into the material found in Bayt al-Qurashi.

Anetta Lyzwa-Piber and Szymon Maslak continued cataloguing and studying the pre-modern pottery which was found in Bayt al-Qurashi. A set of the best preserved specimens as well as pots and shards with red painted or grooved decoration was recorded: drawings, photographs and precise descriptions. The aim is to compile a catalogue which will present a typology of the common local domestic pre-modern pottery of al-Qasr. Provisionally this collection is dated from the end of the Ottoman period till the thirties of the twentieth century.

During a short visit Sandor Fodor continued the study of the magical documents. The first results of the pottery research, the research into the magical documents and a new analysis of the lintels of al-Qasr have been presented at the fifth international conference of the Dakhleh Oasis Project which was held in Cairo from 3rd till 6th June 2006.

Ruud Peters continued the study of the legal documents. Of the documents found in the 2003, 2004 and 2005 seasons about 170 complete or nearly complete ones have been identified as having legal or financial contents. These documents consist mainly of contracts, often notarized in court, of receipts of payment of taxes, appointment of proxies and notes regarding debts or expenses. In addition a few waqfiyya and fatwa were found. Sfar only one judicial sentence ending litigation was identified. The transcripts made earlier from photographs were checked against the originals and a start was made with new ones. So far about seventy have been studied and transcribed. The documents studied so far clearly point to the fact that the Qurashi family, or at least that part of it that lived in the house, were mainly involved in agriculture. More than half of these documents are contracts relative to agricultural activities: lease or sale of land or water rights, sharecropping or payment of taxes on land or springs and wells. In addition there are some documents regarding the maintenance of springs and lists made by individual farmers of the persons they leased water rights from. So far no documents have been found indicating that they were engaged in cattle breeding, trade or artisanal production, nor documents related to the sale of the date harvest.

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The first results of his research were presented by Ruud Peters in a paper at the Conference ‘Customary Law in the Middle East and North Africa’ held on 13th and 14th May 2006 at Princeton University. On the basis of the double document D.04.291 (Figures 3 and 4) from 1206 AH/1791 AD, which contains a sharecropping contract concerning a piece of land in ‘Ayn al-Najjabin, south of al-Qasr and a follow-up of sixteen years later and other sharecropping contracts he stresses the importance of these documents which are called ja`ala contracts.

This kind of a ja`ala contract is interesting because its use for sharecropping is questionable under Shafi`i shari`a law, which was adhered to in the Dakhleh Oasis during Ottoman times. The person who drafted this document apparently was well aware of this. At the end of the document it is therefore explicitly mentioned that consent has legal effects and custom and customary practice as well. The Koran is quoted to underpin this: “Hold to forgiveness; Command what is right [the word ‘urf which is used here can also mean ‘custom’] But turn away from the ignorant.” [Surat al-A’raf (7): 199].

These documents – as well as most others found in al-Qasr – show that there was a high level of legal expertise and sophistication. We do not know where the ‘ulama’ from al-Qasr studied, but at the madrasa in the town no doubt Islamic jurisprudence was taught.
Figure 5  Subterranean wall.

3. Research into the early history of al-Qasr.

During the continuation of the survey of the northern part of Harat al-Shihabiyya Wolf Schijns came across a mud brick wall extending downward from the present floor level for about three metres (Figure 5). This wall, quite clearly, is part of a pre-Ottoman building phase. Its stone foundation is approximately at the same level as the lowest level of the trial trench which was dug in 2004 in front of Bayt al-Qadi en Bayt al-Qurashi and which corresponded with the Fatimid period.

To find out more about the earliest history of al-Qasr two trial trenches were excavated directly west of the old well, ‘Ayn al-Hamiya, on a lower level than the foundations of the adjacent ruins of the probably late mediaeval or early Ottoman houses. None of these two trenches produced any clear results. In none of them even a rough stratigraphy could be discerned. The provisional analysis of the found ceramic shards indicates that in both cases we are dealing with a very disturbed area. Consequently we can only conclude that apparently since Mamluk times this area has been turned over at least once, probably in connection with building activities.

Figure 6  Overview of the remnants of a Roman wall.
Closer visual inspection during these excavation activities, however, made it clear that important data relevant for the
determination of the earliest history of al-Qasr had simply been overlooked in the previous years. Near to the now
dilapidated old mosque the clearly visible remnants of a six meter wide mud brick wall were discovered (Figures 6–8).
This wall is situated below the foundation level of what later has become the Islamic town of al-Qasr.
The situation of this wall (underneath the foundation of the Islamic houses), the thickness of the wall (6 m) and the
measurements of the mud bricks (± 8 x 16 x 33 cm) make it highly likely that it are the remnants of a Roman defensive
wall, most probably of a castra. The still standing remnants (to a height of at least six meters) to the east of the old
mosque, which are built with mud bricks of the same size may well be the remnants of a gate building or a bastion
(Figure 9). However, further investigation is needed to more precisely determine the extent and the period of these
remains.
On old aerial photographs from the sixties the probable remains of a wall parallel to the course of the discovered wall are visible further to the north, just outside the built-up area (Figure 10). It is conceivable that these were the remnants of the northern wall of the *castra*. This, however, could not be checked, because exactly in this area new houses have been built since these photographs were taken.

**Restoration and Reconstruction**

Already prior to the start of the season, from mid December 2005, the production of mud bricks needed for the reconstruction of Bayt al-Qurashi could be started. Thus the reconstruction and further restoration could proceed as efficiently as possible.

1. Bayt al-Qadi
The replastering of Bayt al-Qadi was completed with room BQad 1 on the ground floor (Figure 11). At a later stage in the season, after the completion of the façade of Bayt al-Qurashi both the façades of Bayt al-Qurashi and Bayt al-Qadi were entirely replastered from top to bottom.

2. Bayt al-Qurashi

During the 2006 season by far the largest part of the activities were connected with the continuation and completion of the reconstruction of Bayt al-Qurashi.

The reconstruction of the ground floor of Bayt al-Qurashi was continued with the reconstruction and roofing of rooms BQur 8b and BQur 10a (Figure 12). During the reconstruction of BQur 8b and the necessary clearing out of the adjacent part it became clear that this part, now designated as BQur 12, at some stage had become part of Bayt al-Qurashi providing the stairs to the first floor of BQur 8b and to the built-in filing cabinet BQur 11 also on the first floor. These stairs were reconstructed.

Because of the necessary sequence of the reconstruction activities we could start only relatively late in the season with the reconstruction of the stairs in BQur 12 and so not enough time was left for the last stage but one of these stairs to dry. That meant that the last stage of these stairs and the first floor of BQur 8b and BQur 1 could not be completed (Figure 13).
In the front part of the house the first floor* of room BQur 7b including, of course, its part of the façade was reconstructed and covered with the flooring of the second floor (Figure 14). The decision where to put the window in the façade wall of this room was entirely left to the judgment of the master builders, because no clues could be found from the existing remains of the building. In the back part of the house the first floor of rooms BQur 3, BQur 4 and BQur 10a were reconstructed and covered with the flooring of the second floor. On the masters’ recommendation BQur 3 and 4 were joined together to form one room.

On the second floor the front part with rooms BQur 1, BQur 7a and BQur 7b was reconstructed. At the same time the stairs adjacent to BQur 1 and leading to the top floor were completed. The reconstruction of the three rooms on this floor required also the partial or total reconstruction of the respective parts of the façade wall. In BQur 1 the most southern one of its three large windows was reconstructed, the other two were reopened. The windows in the reconstructed façade wall of BQur 7a and BQur 7b were placed in accordance with those of the floor below. These three rooms were roofed and covered with the flooring of the third and top floor. In the back part the joined rooms BQur 3 and 4 as well as BQur 10a were reconstructed, roofed and covered with the flooring of their third and top floor.

The stair well of the back part of the house which begins on the ground floor at the eastern side of BQur 6 was built up stage by stage in connection with the reconstruction of the successive floors. At the end of the season not enough time was left for the last stage but one of these stairs to dry. That meant that the last stage of the reconstruction of this stair well was not executed.

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* In this case, it is actually the second floor, because in the case of BQur 7 a–b there is a mezzanine between this floor and the ground floor, which does not exist in the rest of Bayt al-Qurashi. Apart from this mezzanine the rest of the floors of BQur 7 a–b is on the same level as those of the rest of Bayt al-Qurashi.
On the top floors of both the front part and the back part the roof terraces above BQur 1, BQur 7a and BQur 7b and above BQur 3, BQur 4 and BQur 10a respectively were provided with protective walls. The highest point of the building was reached on the first of February (Figure 18) and was celebrated appropriately.

After having dried sufficiently the inside of the reconstructed rooms in Bayt al-Qurashi were plastered in the same way as was done in Bayt al-Qadi. The preserved fragments of a late nineteenth century band of inscriptions in red on a layer of whitewash in the entrance hall BQur 1 on the ground floor were secured and conserved and subsequently plastered over. This was considered the best way to preserve these by itself not very special inscriptions for the future in case further study would be desirable. In view of the sort of the here and there remaining fragments of older layers of plaster it is probable that in this way the intended reconstruction of the probable situation of the beginning of the nineteenth century will be best approximated.

* See the report of 2004, page 9.
Not all parts of the house had dried sufficiently or were not entirely completed and so were not yet plastered: BQur 2a, BQur 7b, BQur 8, BQur 10 and BQur 12 on the ground floor and the open room BQur 6 together with the adjacent stair well and also some parts of the roof terraces on the third floor above BQur 3 and 4 and BQur 10a. In all appropriate doorways either fitting old doors or new doors (Figures 24 and 25) manufactured according to the traditional pattern were placed.
The combined façade walls of Bayt al-Qadi and Bayt al-Qurashi were entirely (re)plastered (Figures 26 and 27) and likewise the lower roof terrace above BQur 2 and BQur 5. The rear side of Bayt al-Qurashi could not yet be plastered, because the upper part was not sufficiently dry.

Now that the reconstruction of Bayt al-Qurashi is nearly completed, it still remains unclear if the space which provisionally is indicated as BQur 9 was part of Bayt al-Qurashi and how the connection with Bayt al-Qurashi and the house south of it, especially on the first floor, has been.

3. Bayt Al-’Uthman

The reconstruction of room BAIUth 3 including its covering was completed. A beginning was made with the reconstruction of the stairs in BAIUth 1 (Figure 28).
Figure 29  Surroundings of Bayt al-Qadi and Bayt al-Qurashi on ground floor level.
4. Survey and drawing of Harat al-Shihabiyya

After the survey and drawing of the immediate surroundings of Bayt al-Qadi and Bayt al-Qurashi which Wolf Schijns completed last year (Figures 29 and 30) he continued in this season with the detailed survey of the rest of the Harat al-Shihabiyya. This survey is approaching completion; only the north-western part remains to be done. Finished drawings are expected to be completed before next season.

In the 2006 season which lasted from 11th January to 15th March the QDP-team consisted of Prof. dr. Alexander Fodor (23 – 27 January), Mrs. Verena Leemhuis-Obrecht (20th February – 12th March), Prof. dr. Frederik Leemhuis, Mrs. Anetta I. Lyzwa-Piber MA (14th February – 6th March), Mr. Szymon Maslak MA (14th February – 6th March), (11th January – 12th March), Prof. dr. Rudolf Peters (14th February – 12th March) and Dr. Wolfgang H.M. Schijns (7th – 22nd February). The activities with respect to restoration, reconstruction and excavation were executed in close
cooperation with the local collaborators of the QDP-team. These local collaborators consisted in 2006 of a group of 52 workmen from al-Qasr and surroundings. Many of those have worked with the project for three or more seasons and clearly have gained experience and skills that proved very useful. Their restoration and reconstruction work was executed under supervision of and in cooperation with the master craftsmen Mr. Ahmad Salih Mohammed, Mr. Subhi Abdallah Sanusi, Mr. Abd-al-Ghaffar Mohammed and Mr. Mus‘ad Faris Mohammed who all have collaborated on the project before. In the 2006 season they were joined by master Ahmad ‘Ali Mahdi and for a short period by master ‘Abd al-‘Aziz Mohammed Mohammed. Apart from the fact that the collaboration and the experience of these masters is crucial with regard to the complex matter of the construction of high-rise buildings in mud brick they also guarantee the transmission of their traditional expertise.

Within the framework of the QDP this transmission is taking place in a structured manner, because it was tried, with success, to employ each season as much as possible the same team of workmen. To the satisfaction of the old experienced masters two of the younger collaborators have in the previous two seasons proved their mastership and it is to be expected that in the near future one or two others will likewise reach that stage.

The transmission of traditional expertise and knowledge took place not only in the domain of building techniques related to restoration and reconstruction. In order to provide traditional rush mats for a basic furnishing of some of the rooms of the houses the old mat weaver of al-Jadida not only agreed to resume his old trade and make new matting with traditional material and according to the old pattern, but also to teach his skills to a younger generation (Figure 36).

The very skilful and experienced Mr. Rizq Abdalhay Ahmad, chief restorer for Islamic Antiquities of the SCA in Dakhleh again was charged with the day-to-day management and coordination of the restoration and reconstruction. Especially his knowledge about traditional expertise and whether and/or where it still exists continues to be invaluable to the project.

The supervision on behalf of the SCA was entrusted to the supervising inspector Mrs Affaf Saad Hussayn. The support of Mr. Hamdi ‘Uthman, director Coptic and Islamic Antiquities of the SCA for West Dakhla, Mr. Kamil Bayyumi, director Coptic and Islamic Antiquities of the SCA for East Dakhla and Mr. Magdi Mohammed Abdallah, inspector for al-Qasr of the SCA must also be mentioned. As always, the active interest and support of the director Islamic and Coptic Antiquities of the SCA in the New Valley, Mr. Ahmad Salim is gratefully acknowledged.

The QDP owes much gratitude to the various people mentioned in this report. Their dedication, especially that of the local collaborators of the team, has made also this phase of the restoration and reconstruction of mud brick houses in al-Qasr a success, which, I hope, will eventually lead to the reconstruction of this unique historical little town.

Figure 31 Bayt al-Qadi and Bayt al-Qurashi seen from the old minaret before the 2006 season.

Figure 32 Bayt al-Qadi and Bayt al-Qurashi seen from the old minaret after the 2006 season.
Figure 33   Bayt al-Qadi and Bayt al-Qurashi seen from the rear side before the 2006 season.

Figure 34   Bayt al-Qadi and Bayt al-Qurashi seen from the rear side after the 2006 season.

Figure 35   The local collaborators of the al-Qasr team in 2006.

Figure 36   The mat weaver.
Report on the Human Bioarchaeology 2005

Prof. J. E. Molto reports as follows on the work of his team.

In 2005 the Bioarchaeological team had a short study season that focused on the reconstruction, analysis and photography of subadult burials 582–630 from the cemetery ‘Kellis 2’ at Ismant el-Kharab, that were excavated in the previous season. As well, they reanalyzed a number of burials as part of an error study which is required when you can only analyze data in the field.

The analysis of the subadults included 3 fetal remains (~10%) which has been consistent with previous analyses of this cemetery. The burials in general did not provide unexpected results from those previously analyzed. For example, porotic hyperostosis, a sign of iron deficiency anemia, was low (33% in those between 6 months and 3 years of age) but two individuals had diverse changes that foreshadow other conditions which might be new infections in the population.

The most unexpected result was finding several cases (at least three) of subadult trauma. These cases will be evaluated to determine their etiology (cause). The fact that this part of the cemetery has yielded more cases of trauma than the others may have significance temporally. The new subadult cases could have impact on the understanding of trauma in this ‘cohort’ in antiquity.

In sum, this years field season was designed to analyze previously unanalyzed material, an objective that was successfully accomplished.

Conclusion

The exciting results of this, the 28th season of the Dakhleh Oasis Project fully justify the continuation of our methods. Each of the participants has contributed to the advancement of our understanding of the history of the environmental and cultural development of the oasis and in so doing, contribute to our understanding of the history of both Egypt and the eastern Sahara. We also are helping to advance the science of fieldwork in developing new methods and techniques. It must be said that the interest and generous help of our Egyptian colleagues of the Supreme Council of Antiquities has always made our work in Dakhleh Oasis better. In Cairo, Dr. Zahi Hawas and Dr. Magdi el-Ghandour are to be thanked; and in the Dakhleh Oasis inspectorates, Maher Bashendi, Ahmed Salim and Kemal Bayumi, and the conservators Senaid Safina, Bahaa Osman, Hanna Shawki, and Risk Abdel Hay are all to be thanked for their help and good humour through our long season. Without all of these and many more, our work could not go forward easily.

Respectfully submitted,

Anthony J. Mills
Project Director.