The season of the Polish-Egyptian Preservation Mission at Marina el-Alamein lasted from April 8 to May 30, 2002.1) In the town area the focus this season (Fig. 1) was on houses H 10, H 19 and H 21c with only some necessary maintenance conservation carried out in previously completed structures. Debris and earth from the earlier excavations in the neighborhood were removed from further areas of H 10"E" and H 19. As for H 21c, the great hall H 21"N" (10.45 by 7.50 m) was cleared in preparation for preservation work.

In the necropolis preparations were made for a partial reconstruction of the entrance portico to tomb T 6 and for completing the interrupted preservation of parts of hypogeum T 1G H. Finally, assistance was given to the local Egyptian site authorities in completing the preservation of parts of another, recently uncovered hypogeum, T 18.2)

Specialized conservation work, which took advantage of improved on-site conditions, concerned elements of stone indoor architectural decoration and some surviving mural paintings, as well as a variety of small finds.

1) The mission was headed by Prof. Dr. Stanis³aw Medeksza, architect, and staffed by: Dr. Rafa³ Czerner, architect; Mr. Wies³aw Grzegorek, architect and civil engineer; Ms Gra¿yna B¹kowska, archaeologist; Mr. Piotr Zambrzycki, sculptor and stone conservator; Mr. Eryk Bunsch, stone conservator; and Ms Ma³gorzata Ujma, conservator of mural painting. The Supreme Council of Antiquities of Egypt was represented by the site director and inspector, Mr. Abdel Latif el-Wakil, whose continuous assistance and involvement in our work is duly appreciated as always, particularly his efforts to establish a fairly specialized on-site workshop for the conservation of stone decoration and wall paintings.

The Mission is indebted, as always, to the Supreme Council of Antiquities and to the Secretary General Dr. Zahi Hawass, newly appointed at the time of our work, for continuous support. The Mission is indebted to the following: AKME Zdzis³aw Wiœniewski from Wroc³aw, DSI Polska MiedŸ from Lubin, BP Polska and PolDach from Wroc³aw for their generous assistance in providing for much of the necessary conservation equipment and tools. A special word of thanks to Ms Iwona Zych for editing this version of the report.

2) All the tombs mentioned in this report were excavated by a mission from the Polish Center of Archaeology of Warsaw University between 1990 and 2001.
ARCHITECTURAL CONSERVATION WORKS

With regard to conservation methods, it needs to be reiterated that all mortar used for filling and reconstruction has white cement added in small proportions to avoid further corrosion and to counter the poor quality of lime available on site. The weakness of the traditional building materials, such as clay and lime mortar and clay coating used under the plaster, precluded the employment of ancient building technologies in the modern reconstruction. Surface cracking and heavy salt crystallization in places, as well as color variability are the outcome of mixing the mortars by hand in lieu of a mortar mixer.

Fig. 1. Site plan. Circled areas indicate structures where conservation work was undertaken in 2002 (Drawing based on plan by the Polish Archaeological Mission Marina el-Alamein: K. Kamiński, J. & A. Dobrowolski with later additions)

3) For more detailed discussion of conservation methods and specific problems, see earlier reports by S. Medeksza, PAM VII, Reports 1995 (1996), 42f. and successive volumes.
As our objective is to protect as much as possible of the surviving plaster, including the painted decoration, in situ on the walls of currently uncovered structures, we have left missing sections of plaster in some cases unfilled. This will be done with the proper technological background in a future season.

**COMPLEX OF HOUSES**

**H 10, H 10A, H 10B, H 10E**

In House H 10, apart from reinforcing the columns of the peristyle, some maintenance protection treatment had to be carried out on wall tops and joints. The key task of the season was the completion of an architectural aedicule, work on which had been ongoing since 1999. The shafts of the side columns, the architraves and cornices had all been reassembled and reconstructed in the earlier seasons, and work had proceeded on a partial reconstruction of the tympanum. Some 40% of the two decorated slabs constituting it had to be carved anew and set in their original positions, but using stainless steel dowels in addition to the original stone recesses to support the lower edges (Fig. 2).

In House H 10a, the painted plaster protected last season has survived the winter on site in satisfactory condition. Some corrections were necessary only in rooms 22 and 28. The work concentrated on clearing the northeastern end of the house, including a northward running wall that apparently delimited a longitudinal street enclosing the quarter with house H 10. Part of this wall near the corner, originally built of clay mortar and rough chips of stone, was built up to 0.60 m and the entire wall reinforced with lime mortar. The top of the wall was given a coping of tightly packed stones bonded in mortar with a slight addition of white cement. The overall effect is to make the street running past houses H 10a and H 10E (where this wall was also added to) more evident to the visitor.

Most of House H 10b (Fig. 3) is still under the mounds of rubble and earth from earlier excavations. Partial reconstruction is planned of the courtyard (no. 37), as well as a bread oven (F, explored last year) and

---


5) The method had been developed by Piotr Zambrzycki after a theoretical reconstruction by Rafał Czerner, subsequently executed by them with the assistance, in 2001, of Eryk Bunsch.
Fig. 3. Plan of houses H 10, H 10a, H 10b, H 10E, and H 19. Scale in May 2002
(Drawing: R. Czerner, E. Łukiniak, S. Medeksza, Z. Solarewicz)
A set of steps was found during the cleaning of this area. The occupational level these had led up to was 0.90 m above the floor. The walls of the courtyard and kitchen were raised to 1.00-1.30 m above the ground, the same average height that is used for walls in need of restoration throughout the sector.

HOUSE H 19

Further clearing of the 1.5 m backfill from earlier Egyptian excavations helped clarify the layout of rooms 14, 15, 16, 17, 18 and 19, which is a staircase, and of the northern boundary wall (cf. Fig. 3). The staircase probably had three flights of steps, the walls being built of regular blocks set in lime mortar. In all other cases, the binder used in the walls was a clay mortar, which poses difficulties for maintenance or restoration.

The ambitus, which appears to continue westwards between H 19 and H 10a widens into a small rectangular square from which there were entrances, purportedly of a domestic character, to the two houses. The wall separating room 12 of H 19 from the alley was reconstructed, as was the opposite wall delimiting room 38 and courtyard 37 of H 10a, to a height of 1.20-1.40 m on average on the outside.

The doubling of certain functional features, like the staircase, suggests that yet another house existed west of the currently cleared H 19 and that this building had been added onto H 19 in the typical manner of agglutination that is characteristic of urban residential architecture in the ancient town.

HOUSE H 21C AND HALL H 21“N”

An architectural survey of this building (which had been excavated previously by Egyptian archaeologists) was completed this year (Fig. 4), resulting in an unexpected find in the western portico of the peristyle, in front of the entrance to room 5. Buried under the pavement was a foundation deposit in the form of an amphora, inside which a statuette of Aphrodite and a stand, both of bronze, were found (see section on archaeology below in this report).

Restoration works included replacement of joints in the walls of rooms 2, 3 and 12, reinforcing and building up of walls in rooms 3, 4 and 5, restoring a stone pavement in room 10 and a partial reconstruction of the staircase (no. 9). A broken stone parapet ring was reassembled and returned to its original location.

Fig. 4. House H 21c and hall H 21“N”. Schematic plan showing work completed in 2002 (in black) (Drawing S. Medeksza)
position above the opening of a cistern at
the edge of the eastern portico of the
peristyle.

The clearing of hall H 21“N”
demonstrated its floor level to be depressed
by 1.30 m with regard to that of house
H 21c. The blocks used in its walls were
regularly dressed and measured 0.40 x 0.30
x 0.60 m on average. The hall had three
entrances from the north, the central one
measuring 1.80 m, the lateral ones, sit-
uated near the corners of the room, 0.85 m
each. There was also a small doorway in the
west wall. The pavement consisted of slabs
measuring 0.40 x 0.60 m on average and
0.10 m thick.

An aedicule(6) discovered among the
elements of architectural decoration prob-
ably came from the south wall, opposite
the entrance and on the same axis as the
main doorway. Enough of it remained for
a theoretical and then actual reconstruction
to be carried out. It was set in the thickness
of the wall (0.45 m), its back wall being
0.10 m thick and its decorated elements
projecting 0.24 m from the wall face. The
architectural frame consisted of a sill, a pair
of engaged columns standing on it and
accompanied by two flat pilasters flanking
the inside of the niche, capped with capitals
echoing the so-called Nabatean type in
form (Fig. 5b). Topping this was the
architrave and rounded cornice of the
tympanum. The blocks of stone used for
the sill were typically 0.26 x 0.26 x 0.52 m,
those for the engaged columns and pilasters: 0.33 x 0.33 x 0.64 m, and the
architrave and cornice were of blocks of
varying size. The dimensions of the niche
and the form of the lower part, now lost,
could be reconstructed based on knowledge
gained from the study of three other aedicule found at the site.(7)

Since the proportions of these niches,
regardless of actual size, appear always to be
the same, it was possible in this case, hav-
ing the width of the niche – 1.36 m –
to reconstruct the height proportionately at
2.16 m. Also the level of the sill – 1.50 m
above the floor – was taken from a com-
parison with other aedicule.

In the actual reconstruction, the lower
parts of the niche were recreated in stone in
simplified form. The original pieces of the
upper part were protected and then reas-
sembled. The tympanum was reinforced
structurally and will be mounted in the
coming season (see remarks in the spe-
cialized conservation section below in this
report).

The hall H 21“N” incurred heavy
damages due to earth subsidence, possibly
in effect of an earthquake. The walls had
cracked and slipped and a large section of
the floor had settled (Fig. 5a). Restoration
of the original form would have been
extremely difficult and would have entailed
a virtual rebuilding of the hall from scratch.
It was deemed unnecessary and the pre-
servation was limited to a structural
reinforcing of the walls and floor with
additional masonry. The crack in the floor
and subsiding of the western two thirds of
the hall can be seen also in rooms 10 and 1
of house H 21c abutting the hall on the
south. Again, this difference in levels was
kept. The walls were built up, especially
the northeastern and northwestern corners,
to a height of 1.20 m for the corners and
1.00 m for the walls. The cracks in the

---

6) The following remarks on the aedicule have been contributed by R. Czerner, who is also the author of the theoretical
reconstruction.

7) The other aedicule include the niche in room 2 of House H 10 (cf. S. Medeksza, PAM XI, op. cit., 50 and Figs. 5-6;
id., PAM XII, op. cit., 69 and Fig. 5); the niche in room 14 of H 9 (cf. id., PAM XI, op. cit., 51 and Figs. 9-10); and a small
niche from room 2 of H 21c (cf. id., PAM XII, op. cit. 73 and Fig. 10.)
Fig. 5a. Hall H 21"N". Before conservation. Close-up view from the north of the cracked south wall and displaced pavement (Photo S. Medeksza)

Fig. 5b. Hall H 21"N". After reconstruction in 2002. View from the north with the reconstructed aedicule in the south wall (Photo S. Medeksza)
walls were filled with masonry, but recessed with regard to the original wall face. For the walls, original stone blocks were used bonded in lime mortar mixed with some white cement.

**HYPOGEUM TOMB T 6**

Specialized stone conservation works followed the partial reconstruction of walls surrounding the open courtyard and the external walls in the front part of the tomb, carried out in 2000, and also the anastylosis and reconstruction of engaged columns, pillars and door jambs, which has continued from the previous season. Two to three courses of reconstructed elements were mounted in order to clarify the functional layout of the aboveground mausoleum.

In the course of the 2002 season several column drums were reconstructed of Helwan limestone, the objective being to recreate the rhythm of columns in the front portico. The two columns flanking the main entrance were built up to a height of 1.15 m, while the remaining columns were made to be from 0.95 to 0.76 m high. The lime mortar used for the bonding included some white cement. No dowels were used as anathyrosis of the sections afforded sufficient adherence of the elements.

Landscaping around the tomb (done by the archaeological mission earlier in the season) was intended to make the facade of the monument better visible from the tourist route (Fig. 6).

**HYPOGEUM TOMB T 1GH**

Earlier conservation by a mission directed by J. Dobrowolski covered staircase G and the subterranean chamber, the ceiling of which had to be supported on a masonry pillar.8) In 1998, a piece of cornice decorated with dentils from the main entrance through a kiosk at the top of staircase G was reassembled from pieces and restored. A theoretical reconstruction of the kiosk was also prepared.

---

In 2002, the casing wall of the shaft opening into the burial chamber was reconstructed from original pieces, based on the original reconstruction drawings from 1993. It was necessary to recreate some of the original blocks which had been lost over the past nine years.

In need of immediate protection were the casing walls of the secondary staircase (H) leading to the burial chamber. They had partly collapsed due to atmospheric factors and, unfortunately, vandalism. What survived was also at risk of collapsing. Sand and soil were removed from behind the casing walls, the blocks were cleaned and the walls built up to a secure height. The slabs used (0.20 x 0.40 x 0.70 m) were laid in alternate layers of headers and stretchers and the space behind the walls was filled with sand to anchor the headers. Building up was also necessary for the transversal head wall at the end of the staircase, this in order to recreate the original appearance of the tomb superstructure, which had been at least three courses of stone blocks underground in antiquity.

Still more work needs to be done on the kiosk remains above staircase G.

HYPOGEUM TOMB T 18
In view of errors made in the rebuilding of the courtyard perimeter wall by an Egyptian team of builders working before the mission's arrival on site in 2002, it became necessary to undertake corrective steps. The uneven lower courses were covered with sand, the walls were leveled and the wall faces properly jointed.

The missing parts of the vault of the staircase, one near the courtyard and the other near the aboveground kiosk, were then reconstructed of new stones laid on timber scaffolding. At the top end, the vault turned out flatter than desired due to weakness of the scaffolding, but the structure appears sound overall. The walls of the kiosk were built up to a height of 2 m and left thus in the absence of any elements from the roofing of this structure that could make a proper reconstruction possible (Fig. 7).

Finally, landscaping around the tomb created a tourist path leading to both tombs T 6 and T 18.

“TOWN SQUARE”
Excavations by the Polish Archaeological Mission directed by W.A. Daszewski have started a systematic clearing of a large square situated in the town center.\textsuperscript{9} An exedra with stuccoed wall decoration was

\begin{quote}
9) For the first seasons of work, cf. W.A. Daszewski, \textit{PAM} XII, op. cit., 58-61; id., \textit{PAM XIII, Reports 2001} (2002), 80-86 and especially Fig. 10 for the exedra, as well as the contribution in this volume.
\end{quote}
found in the southern portico. The rectangular paneling, once presumably painted, required specialized conservation.¹⁰ The plaster was reinforced after sand had been removed from all the voids between layers and between the plaster and the stone wall face. These voids were subsequently filled with sand and lime mortar. The mortar was modified with acrylic resin to reinforce it and to improve its adherence to the base. It was unified chromatically and in surface quality by powdering with desert sand and infusing with a water dispersion of an acrylic resin PRIMAL AC33.

SPECIALIZED CONSERVATION

Polychrome column shaft from H 21c.¹¹) Continued salt migration from the stone core to the polychrome plaster surface of the column shaft remained a key conservation issue, as it tended to cause blistering and powdering of the painted layer.

The secondary layer of uniform red plaster was removed leaving only a small section to testify to its presence. Consequently, the underlying floral motif was revealed, including the pitting that had once ensured better adherence of the secondary coating of plaster. To unify the overall effect, this pitting was filled with lime putty (modified with PRIMAL AC33) with quartz sand as filler, and point-retouched (3% water dispersion of PRIMAL AC33 and dry pigments).

Elements of the aedicule from H 21“N”.¹²) In the case of the poorly preserved elements of the aedicule from H 21“N”, the objectives of the conservation were to preserve the original substance and to prepare it in aesthetic terms for conditions of outdoor exposition.

The first step, following a full documentation of the pieces, was to prepare templates of the missing parts of carved decoration. These elements (sill, bases of engaged columns and pilasters, shafts and back wall of niche) were then recreated in new stone material. The original substance of the niche was protected, including the shafts of engaged columns, two capitals and elements of the architrave and cornice. One element of the engaged column shaft had to be attached to new stone by slotting with stainless steel dowels (20 cm long, \( \pm 10 \) mm) and an adhesive mix based on epoxy resin (ARALDITE by Ciba Geigy) modified with limestone filler.

The heaviest damage was to the two capitals and required considerable parts (70% and 30% of the right and left capitals respectively) to be redone in suitable stone material and attached with epoxy resin and stainless steel dowels (volutes of the less destroyed capital). In the actual reconstruction, the original stone surfaces were exposed to view. The restoration was executed based on a study of the preserved original forms and carving techniques.

The meander cornice in the central part of the architrave was also glued together and the missing parts were reconstructed in stone. As a final step, the niche was remounted in its original position in the south wall of the hall and any small lacunae were filled with mineral mortar.

¹⁰) The conservation was executed by M. Ujma, who also kindly provided the following description of the procedure.
¹¹) The actual conservation and the following remarks are by M. Ujma. Cf. also S. Medeksza, _PAM XIII_, op. cit., 100 and Fig. 14.
¹²) All the remaining specialized conservation work was performed by P. Zambrycki, who also kindly contributed the following comments on treatment procedures.
A different procedure was followed in the conservation of the rounded cornice of the tympanum. Of the five pieces making it up, four were preserved, but the condition of the stone was poor. The stone was therefore reinforced with an ethyl silicate (FUnCosil 100 by Remmers, Germany) and will be remounted in the next season, after the consolidation process has had the required time to work.

**Tympanum elements of the aedicule from H 10.** Conservation followed the same basic procedure as in the case of the above-described aedicule and resulted in a remounting of the preserved fragments in their original position crowning the niche in room 2 of house H 10. The stainless steel dowels (ø12 mm) that were used were 28 cm long and were spaced symmetrically on both sides of the tympanum base.

**Small finds.** Artifacts from the ancient town demonstrate the destructive effects of collapse and burning of the buildings, in which they were found, as well as deterioration due to long-term contact with salty soil and rapid temperature changes.

In the case of objects made of pottery, stone or faience, the first step is always consolidation of the structure, only afterwards followed by cleaning and restoration of the original form. As for artifacts of bronze or iron, it is not always prudent to remove fully the layers of corrosion. Continuous maintenance by conservators under museum conditions is advised.

In the course of the season special attention was paid to the bronze finds: statuette of Aphrodite (cf. Fig. 8), stand, coins and pieces of jewelry. The necessary photographic documentation was made, after which the surfaces of these artifacts were cleaned using water solutions (10%) of sodium benzoate and trisodium EDTA. Mechanical cleaning was applied locally and post-conservation documentation was prepared.

Faience bowls posed a special problem. Their initial cleaning involved mechanical removal (with scalpels and soft brushes) of dirt and encrustation. Then they were infused with Funostil 100 and seasoned under stable conditions. Desalination and gluing will follow.

**ARCHEOLOGICAL RESCUE WORK**

Preparations for conservation and building activities frequently required archaeological supervision, especially where it was necessary to clear previously unexcavated sections of buildings.13)

Perhaps the most dramatic find of the season was a foundation deposit discovered in a pit under the stone pavement of room 1 in house H 21c, situated just in front of the entrance to room 5. The body of a big amphora had been placed vertically in the ground, the hole at the top covered with a paving slab of limestone and a piece of marble tile. The fill of the vessel consisted of sand with sherds of pottery, glass and animal bones. Inside the vessel an altar stand of bronze was found on the bottom and lying next to it a bronze statuette of Aphrodite, which had once stood in the middle of it on top (Fig. 8).14) There were traces of burning inside the top of the altar.

---

13) The following is a contribution by G. Bąkowska, who supervised all the archaeological work at the site this season.
Fig. 8. Bronze statuette of Aphrodite (top left) and altar stand (bottom left) found in a foundation deposit in House H 21c. Reconstruction showing presumed original appearance (right) (Photos P. Zambrycki; drawing W. Grzegorek)
Clearing in House E 10“E” concerned rooms 2, 4, 6, 10, 14 and 15. Room 15 (2.20 by 4.00 m), partly cleared, turned out to be connected by a meter-wide doorway with room 14 (at least 6.10 m E-W by 4.90 m N-S). Three stone slabs by the southern wall formed a bin. In a lower stratum, traces of a hearth appeared with considerable quantities of potsherds nearby. Bronze artifacts were also numerous in this layer and consisted of coins, a pendant, a brooch (Fig. 9), rings, needles, nails and fishing hooks. Other finds included a fragmentary oil lamp with a representation of Medusa, a faience sculptured head, a small faience bowl and a virtually complete glass bottle.

Two levels of floors not connected to any observable wall were cleared underneath the structure, the lower of the two appearing on virgin sand.

The western part of the southern wall of room 15 was at the same time the eastern wall of room 6 (5.30 by 5.20 m). Under the rubble cleared from the room a wall of up-ended stone slabs (0.50 x 0.30 m) was found to run for a length of 4.25 m, parallel to the room’s north wall. A doorway, 1.60 m wide, pierced the east wall and a plain rectangular niche (0.52 m wide and 0.45 m high) was observed in the south wall. A stone hearth with quantities of ceramics and burned animal bones around it was found inside this room. A square altar with a round depression in its top had been reused in the construction of the hearth; one side of it was decorated with a building façade. The pottery included fragments of amphorae, kitchen vessels, terracottas and oil lamps (one with a handle in the form of a bust of Sarapis).

15) Similar enamelled disc brooches are dated to the second half of the 2nd century AD, cf. Ori delle Alpi, eds. L. Endrizzi, F. Marzatico (Trento 1997), 481, fig. 93 and 482, fig. 94; R. Hattat, Brooches of Antiquity (London 1987), 214, no. 1132 and 173-174, nos. 1048, 1050.

16) For a similar ring with empty bezel from the 2nd century AD, see e.g. V. Galliazzo, Collezioni e Musei Antichita del Veneto (Roma 1979), 169, no. 69.
A test pit by the east wall yielded two bronze coins\(^{17}\) as well as pieces of lamps, glass bottles and a faience plate.

Clearing of the north wall of room 5 brought to light a considerable deposit of kitchen vessels in room 2. Room 4 yielded a bronze ring with a bust of Sarapis attached to the oval bezel (Fig. 10).\(^ {18}\)

In H 19, rooms 13, 14, 15, 16, 17, 18 and 19 in the western part of the house were cleared of rubble. The lintel and jambs belonging to the west entrance, 0.65 m wide, were found in room 14 (which measured 3.80 by 3.20 m). The south door at 0.85 m was wider and the east one at 1.05 m was the widest. Two ostraca were found on the floor with a quantity of pottery.

A hearth occupied the northwestern corner of room 15 (which measured 2.50 by 1.40 m). Traces of earlier hearths were found in the layer below the foundations of the walls of this room. This layer also yielded a fragment of a stamped frying pan in addition to some pottery vessels, glass vessels, a block of limestone with carved triglyph decoration, a fragment of mortar and pieces of oil lamps with a personification of Africa on the discus.\(^ {19}\) Room 13 (5.00 by 6.50 m) also contained a hearth and a furnace, the latter made of an amphora surrounded by stones. The earlier stratum yielded bronze coins, two complete oil lamps, an unguetarium, a faience bowl and a terracotta woman's head.

---

18) F.H. Marshal, Catalogue of Finger Rings, Greek, Etruscan and Roman in the Departments of Antiquities, British Museum (London 1907), 178, Tav. XXVIII, no. 1122; 204, Tav. XXXI, nos. 1301, 1302.
19) G. Ciurletti (ed.), Le lucerne antiche del Trentino (Trento 1986), 77, no. 33, dated to the second half of the 1st century AD; G. Sfameni Gasparro, I culti orientali in Sicilia, EPRO 31 (Leiden 1973), 41, Tav. XL, figs. 58, 59; 96, Tav. XXIV, fig. 38.