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B. J. Kemp, 'Site formation processes and the reconstruction of house P46.33', in B. J. Kemp (ed.), *Amarna Reports*, VI (EES Occasional Publications 10; London, 1995), 155–8 (subsequently Kemp, *Amarna Reports* VI, 157)

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EDITORIAL FOREWORD

THE Society has continued with its busy fieldwork programme, with excavation carried out at five sites, with the cooperation of the Supreme Council of Antiquities in Egypt. Preliminary accounts of their operations and findings appear in the Fieldwork, 1996–7 section of this volume. Additional exploratory work on various fronts was initiated or continued, both with the aim of establishing future Society fieldwork projects and of providing more technically-based knowledge drawing on previously excavated material. The recently established Cairo office of the EES, in the very capable hands of Miss Rawya Ismail since October 1996, has continued to provide active support in Egypt for the Society's projects as well as for several other missions.

The Society has always regarded the publication of the results of its fieldwork for scholars and those with a wider interest in ancient Egypt as one of its primary duties. In the last year several final excavation reports have appeared in print (see the inside back cover for details). Those by Professor William Y. Adams (mediaeval period) and Dr Pamela Rose (hinterland survey) are centred on the physical remains at Qasr Ibrim. That by Dr Patricia Spencer presents work carried out by the Society in 1938–50 at Amara West in Nubia. Happily for Egyptology, Lady Elizabeth Anne Hastings was able to complete her study of the sculpture found during the EES excavations in the Sacred Animal Necropolis at North Saqqara before her death, and the volume has now appeared in print. The Society has also published Professor László Török's account of the Liverpool University Institute of Archaeology's work at Meroe undertaken by John Garstang in 1909–13.

The EES office at Doughty Mews has continued to thrive and to be a hive of activity. The Society now has an email address at: eeslondon@compuserve.com.uk. After many valuable years of devoted service at both administrative and social levels, Miss Sylvie Weens left the London office for pastures new. She has been succeeded by Dott. Carla Gallorini, who has added a touch of Italian style to the London premises. Also after four splendid issues, Dr John Taylor has passed over the editorship of the Society's bulletin *Egyptian Archaeology* to Dr Patricia Spencer. The purchase of new equipment has meant that much of the setting and layout of the bulletin can now be done in the Society's office.

Despite impending alterations, the British Museum launched a major exhibition of ancient Egyptian mummy portraits. Entitled 'Ancient Faces', the exhibition was presented by the British Museum and the Fondazione Memmo. It ran from 14 March to 20 July 1997 in London, where it received enthusiastic reviews, especially for a type of painting not widely known, and was seen by 58,000 visitors. The accompanying catalogue was written by Dr Susan Walker of the Greek and Roman Department and Dr Morris Bierbrier of the Department of Egyptian Antiquities. The exhibition is currently at the Fondazione Memmo in Rome from 29 October to April 1998, and a smaller version will

travel to Greece in 1998. The British Museum also sponsored the popular Sackler lecture on July 16, this year delivered by Dr Dieter Arnold on 'Recent Excavations at the Pyramid of Senwosret III at Dahshur' and accompanied by excellent slides. The colloquium the following day, entitled 'Current/Recent Research in UK Egyptian Collections', contained contributions from the Oriental Museum in Durham, the Ashmolean Museum in Oxford, the Fitzwilliam Museum in Cambridge, the Manchester Museum, and the Petrie Museum and the British Museum in London.

Building and expansion plans will in the forthcoming months severely restrict access to British Egyptological facilities for the international scholarly community. While such disruptions are inconvenient, they are inevitable as major institutions strive to continue their valuable services, providing staff and visiting scholars with facilities which look forward to the next millennium. The Department of Egyptian Antiquities at the British Museum has sent us notification of restricted services:

> Due to the British Museum's extensive redevelopment and refurbishment programme, certain galleries and services will be affected as follows: Displays: Rooms 25a and b (sculpture gallery annexes) will be closed permanently from July 1; Room 60 (mummy room) has already closed; Rooms 62 and 63 will be closed by July 1. Room 61 now contains a temporary display of mummies and daily life; Rooms 62 and 63 will reopen at the end of 1998/beginning of 1999 with a new display of funerary archaeology, including mummies. From November 1997, the Egyptian sculpture gallery (25) will be partially affected, particularly the objects on the east wall.
>
> Visitor services: In view of the forthcoming construction works up to 2000, the use of the Students' Room in the Department of Egyptian Antiquities will be seriously restricted. Colleagues wishing to examine objects in the study collection are requested to advise us as far in advance as possible. In the circumstances, we cannot guarantee that all requested objects will be available for study. Due to construction works, objects in the basement storage areas will be largely unavailable for the next two to three years; these include most large stone and wooden artefacts and all small sculpture and stelae. The Students' Room may have to close completely during certain periods up to 2000. The Department will remain open for general enquiries and the authentication of objects between 2:00 and 4:30 on weekdays, but visitors may expect some delays and a reduced service.
>
> Photographic services: Customers with photographic requirements are advised to contact the Department's photographic officer well in advance of any publication deadline (tel. 0171-323-8683; fax 0171-323-8303). Some short-notice requests may have to be refused; delays in processing photographic orders are also expected. The Department's email address is: egypt@british-museum.ac.uk. The British Museum website is: http://www.British-Museum.ac.uk.

One exciting development from these enabling works for the British Museum's Great Court project will be the movement of the reserve collection of Egyptian sculpture and relief into a specially conditioned store for porous stone in the Museum. This store will allow the material to be much more accessible to scholars and students (by appointment) in the future.

Major building work in Oxford will also mean limited access to library and archive material there. Dr Jaromir Malek writes:

> The material in the Archive of the Griffith Institute and the records of the *Topographical Bibliography of Ancient Egyptian Hieroglyphic Texts, Statues, Reliefs and Paintings* will not be available for consultation from 1 March 1998 until October 2000. This is due to work on the new Sackler Library. The situation will be reviewed after the Archive and the *Topographical Bibliography*

records have been moved into temporary accommodation. Up to date information will be available on the Griffith Institute's website: http://www.ashmol.ox.ac.uk/Griffith.html.

It is rarely that even temporary Egyptological appointments can be heralded. We can now welcome Dr Mark Depauw, a demotic scholar, as the latest Lady Wallis Budge Junior Research Fellow at University College, Oxford, and wish him a productive tenure of the post. Also in Oxford, Dr Margaret Serpico has been appointed to a Wainwright Fellowship to pursue her investigations into chemical residues on Egyptian pottery.

Unfortunately, deaths are a more frequent occurrence, and our field has suffered the sad loss of several major figures in the last year. Dr Hellmut Brunner, Emeritus Professor of Egyptology at the University of Tübingen, whose wide-ranging studies have formed such an important part of so many Egyptologists' training and research, died on 20 February 1997 at the age of 83. On 4 March 1997 the International Association of Egyptologists announced the death of the Hungarian scholar Professor Vilmos Wessetzky. Egyptology generally and the EES have suffered a loss in the death of Lady Elizabeth Anne Hastings in March of 1997. Having earned an MPhil at University College London, she spent many years working in an unobtrusive but very valuable way for the Society and the subject. She was formerly a member of the EES Committee and undertook practical research on behalf of the Society's projects. Her book *The Sculpture from the Sacred Animal Necropolis at North Saqqâra 1964–76*, has just appeared in print and will serve as a substantial measure of her scholarship. Lady Hastings was also a liberal patron of the arts, and her family trust (the Fitzwilliam Trust) facilitated gifts to museums in Britain. Her breadth of interest is also seen in her long association with the Near Eastern Department of Christie's. We have recently heard of the death of Mrs Constance Pilgrim (1911–1996), who will be familiar to readers of the *Journal* for her exceptionally fine hieroglyphic hand, as seen in the transcriptions of the Semna Despatches (*JEA* 31 (1945)), and of the Wilbour Papyrus (Oxford, 1948). She was taught hieroglyphs by Sir Alan Gardiner, and her first husband was the British Egyptologist Paul Smither (1913–1943).

The *JEA* does not emerge unaided from the Nun, but is the result of many hours of labour. The new Editor-in-chief must thank the other members of the group who have worked gallantly with pen and keyboard to bring *JEA* 83 to fruition: Dr Richard Parkinson, Dr Geraldine Pinch, Professor John Tait and Dr John Taylor. The hieroglyphs and Coptic were set by Dr Nigel Strudwick, as in recent years. Professor John Baines, who has worked behind the scenes offering advice, moral support and technical expertise with the Oxford computer system, deserves our gratitude. Finally, it remains for me to thank Dr Helen Whitehouse who, having edited the last four volumes, has passed on the *Journal* in such a healthy state, along with much useful and sage advice. Her wry sense of humour and unfailing good spirits made her a pleasure to work with.

FIELDWORK, 1996–7

DURING 1996–7 a variety of work was carried out by the Society in Egypt. Accounts of the fieldwork and preliminary results from five sites at which the EES is currently involved are included below. Between March and May 1997 Patricia and Jeffrey Spencer inaugurated the Society's new survey of the Delta with visits to sites in the eastern Delta, east and west of the Damietta branch of the Nile, from the British Museum expedition house at Tell el-Balamun. Sais will provide a starting point for survey in the western Delta in the autumn of 1997 under the direction of Dr Penelope Wilson.

Work continued on other Society projects, directed towards eventual publication of fieldwork results. A further study season concentrating on the pottery from the 1977–9 Society excavations at the Anubieion at Saqqara was conducted by Peter French and Andrew Boyce in October–December 1996. At Buto the German Archaeological Mission made it possible for Peter French, Janine Bourriau and Tomasz Gorecki to continue to work on the ceramic material from the previous EES excavations (see the fieldwork report in *JEA* 82). From March to June 1997 they completed the recording and analysis of the pottery and drew up a typology; their work should be completed in 1998. Also during March 1997 John Baines spent a short period at Abydos photographing and collating scenes and texts for *The Temple of Sety I at Abydos* V. The season which Paul T. Nicholson had planned at the Saqqara Sacred Animal Necropolis for March–April 1997 had to be postponed for administrative reasons. He hopes that, with the kind cooperation of the Egyptian authorities, the mapping of the North Ibis Catacomb and conservation of bronzes discovered near the entrance to the Falcon Catacomb can be completed in March–April 1998.

The Society's activities in Egypt have been assisted and advanced by a number of organizations and individuals to whom it owes its deepest gratitude. The Supreme Council of Antiquities (SCA), under its former Chairman Prof. Abd el-Halim Nur el-Din and his successor as Chairman Dr Ali Hassan, has cooperated with its usual courtesy and efficiency with members of the Society's expeditions. The SCA, especially its Secretary Mr Mohammed Shaaban and the staff in the Abbassiya security office, deserve our warmest thanks. Miss Rawya Ismail has laboured diligently and enthusiastically in the Cairo office, assisting our fieldworkers and looking after the interests of the EES and its members in Egypt; her efforts are much valued and appreciated.

Memphis, 1996

THE 1996 Memphis season ran from 4 September to 10 December, the staff members being Bettina Bader, Richard Bevan, Janine Bourriau (Deputy Field Director), Sarah Buckingham, Veerle Calcoen, Ian Casey, Carla Gallorini, Dr Colin Hope, David Jeffreys (Field Director), W. Raymond Johnson, Mary Anne Murray, William Schenck, Anna Seiler, and Dr Toby Wilkinson. We acknowledge with gratitude the help and cooperation

of the Officers of the SCA: Dr Zahi Hawass, Director of Giza, Saqqara and Memphis; Mr Mohammed Hagras, Director of Saqqara; Mr Ezzat Mohammed Abd el-Salam, Director of Mit Rahina; and in particular Mr Shaaban Mohammed Saat, who was attached to our team as SCA representative.

There were three main objectives this season: to investigate the buried stratigraphy of the floodplain to the east of the North Saqqara escarpment (Bevan, Casey, Jeffreys, Murray, Wilkinson); to continue the epigraphic survey of re-used blocks of Amenophis III within the Ramesside Ptah temple on Kom Rabi'a (Johnson, Schenck); and to continue the post-excavation analysis of the ceramic assemblage from the Kom Rabi'a excavations of 1984–90 (Bader, Bourriau, Buckingham, Calcoen, Gallorini, Hope, Schenck, Seiler).The first of this season's two field projects was carried out as part of the medium-term investigation of the earlier history of Memphis. Drill cores taken previously from this area suggested that occupation as far back as the Early Dynastic Period might be located here, where a clear sequence of interfingered dune sand and fluvial silt deposits had been recorded.

Excavation and survey east of the Saqqara–Abusir escarpment (David Jeffreys)

A pilot exposure of 6 × 6 m was selected on the west bank of the Shubramant Canal (Grid Reference UTM 36 E328695 N3306780), 40–50 m north of two core sites (75, 90)[1] which had given particularly promising results. The site was given the identification code SMC 96 (fig. 1).

The early stages of the excavation were hampered by unusually high local ground water, due to record levels in Lake Nasser and the early release of water into the agricultural zones. Three weeks of excavation allowed us to excavate 1.20 m vertical depth of comparatively dry stratigraphy within a 12 sq m area of the site, showing a more complex sequence of deposits than had been observed in the drill cores (fig. 2).

Beneath the agricultural topsoil—a thin (30 cm) modern veneer of alluvial silt—lay a well-defined coarse yellow aeolian sand throughout the exposure, with a linear feature visible in its upper surface, consisting of slots and several postholes filled with charred organic material (fig. 3), with associated pottery of the Graeco-Roman and Coptic Periods and the Old Kingdom. At a depth of 90 cm (= 18.8 m above sea level), at the eastern end of the exposure, a dark grey clay feature running north–south was recognised, which may be an agricultural feature such as a plough furrow, but is remarkably regular and could well be brickwork. The orientation is markedly different from the more recent feature. At this lower level the associated pottery was no later than the Old Kingdom, but this dating is from a very small sherd sample. This apparent discontinuity in occupation is reflected in the history of the North Saqqara plateau immediately west of the site, and is demonstrated by the nearby cores, in which second and first millennium BC pottery seems to be absent. However, given the low sherd count from the exposure itself and the strong suspicion that any Old Kingdom pottery is likely to be residual, we cannot yet be satisfied of the true date of these lower features until a larger context is established for them.

The presence of cultural features interspersed through the different levels of the sand sheet is encouraging, since it promises some evidence of the seasonal use of the valley

[1] See *JEA* 78 (1992), 4, fig. 2; 79 (1993), 13, fig. 1.

margin, and may provide information on past strategies for coping with ecological change, in the form of massive intrusion of desert sand into a previously inhabited or cultivated area.

This season's drill cores in the area suggest that the true level of Old Kingdom occupation is normally at about 16.5 m SL (4 m below ground level). They have also contained enough pottery of the Early Dynastic Period for us to be able to predict with reasonable confidence that unmixed deposits of this date occur between 14 and 16 m SL, and lie directly over archaeologically sterile clays which run up to the cliff face. This is lower than the alluvial ridge, associated with third millennium pottery, observed in cores west of the ruin field;[2] it is still, however, relatively high-lying for a valley-edge zone 5,000 years old. Six cores (120, 122–7, see fig. 1) were extracted along and beyond the raised track which leads from the Shubramant Canal towards the Saqqara Antiquities Inspectorate, supplementing the earlier cores 75, 90 and 92 along the same line. This allowed a profile of buried dune deposits to be compiled up to half a kilometre from the cliff face (fig. 4). The most westerly core in the line (125) shows that a deposition episode or

FIG. 1. Local plan of valley between western escarpment and Shubramant Canal, showing excavation and drill core sites. Contours at 1 m vertical intervals; UTM grid intersects at 100 m intervals.

[2]See *JEA* 74 (1988), 21–2, figs. 4, 5.

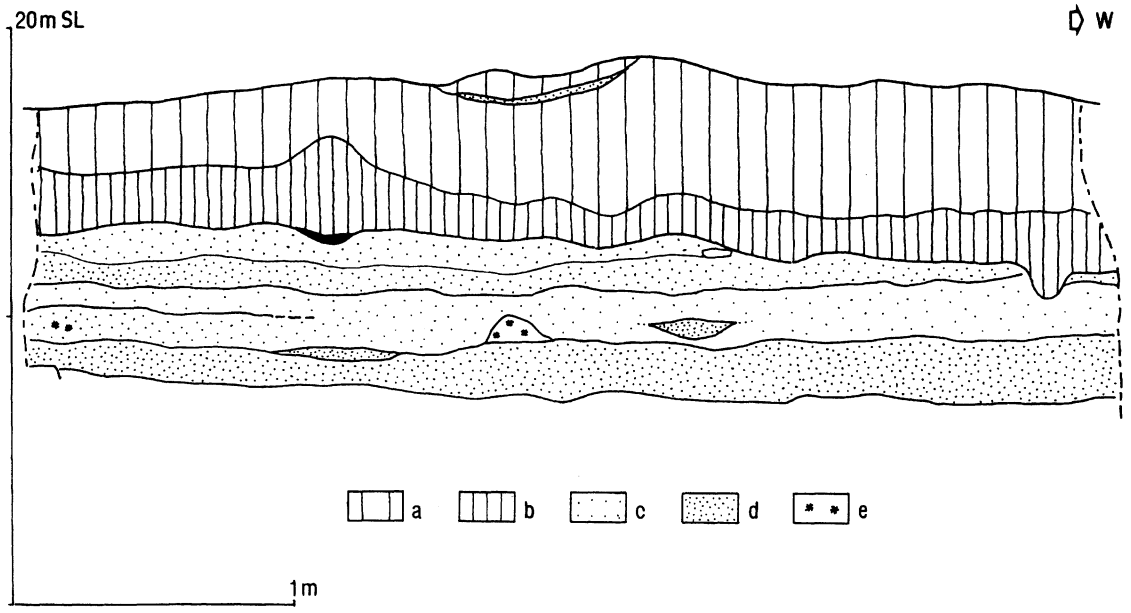


FIG. 2. North-facing section of SMC 96 at end of season. Key to soils: (a) silty topsoil; (b) clayish silt subsoil; (c) pale brownish yellow coarse sand; (d) darker brown mixed sands and silts; (e) charcoal inclusions.

episodes brought river clays and silts to within 100 m of the escarpment; the most easterly (126) contains the bluish black silt (*iblîz*), typical elsewhere of permanently wet deposits—perhaps the bed of a buried stream or canal to the east of the present Shubramant Canal, and possibly a remnant of the residual neck of water shown on nineteenth-century maps and views, leading north–east from the seasonal pond at the Unas valley temple. It is worth noting that there are no such *iblîz* deposits in any of the more westerly cores, with the exception of deep black river sands at around 9 m SL (in core 75), supporting the idea that this stretch of the floodplain margin once formed a high dry shelf or platform between the 'lakes' at the Unas and Abusir valley temples.

A field trip to Abusir in the company of Mohammed Yusuf of the Saqqara Inspectorate confirmed several locations where archaeological finds had been rumoured or reported in recent years; most of these corresponded to past drill core sites. We also visited one central location where the ground rises to just under 30 m SL, where fresh stratigraphic sections were exposed around a current building development. Another visit, to the Early Dynastic cemetery excavated in the 1980s by Radwan to the north of the Niuserre sun temple at Abu Ghurab, provided some valuable field observations of the strata underlying the tomb superstructures. In particular, it is clear that in this comparatively low-lying position some sand encroachment had begun before the tombs were built, in contrast to the situation of the contemporary pit-burials at Abusir itself.

Ptah temple epigraphic project (W. Raymond Johnson)

The programme of recording the re-used limestone blocks at the small Ramesside Ptah temple on Kom Rabi'a resulted in the identification of another 31 blocks and fragments

to add to the 31 recorded in 1995; it is clear that more re-used blocks have been used in the fabric, turned in towards the core of the sanctuary walls. Measured drawings and 1:1 tracings were produced for all the re-used examples, using impressing and tracing techniques which allowed access to awkwardly-placed blocks and which worked well underwater (the lower part of the temple was completely flooded this year).

New material included several fragments of offering lists in raised relief; more name-frieze blocks and fragments with cartouches of Amenophis III in raised and sunk relief, and procession scenes of priests carrying the barque of Ptah-Sokar on their shoulders. Re-used architectural fragments and decoration relating to the barque of Ptah-Sokar make it likely that the structure dismantled by Ramesses II to build his small Ptah temple was a barque sanctuary dedicated to this deity. The inscriptions and the style of the relief work, with its innovative solar iconography, date it firmly to the end of Amenophis III's reign, and it was undoubtedly part of his great Ptah temple complex, 'Nebmaatre-United-

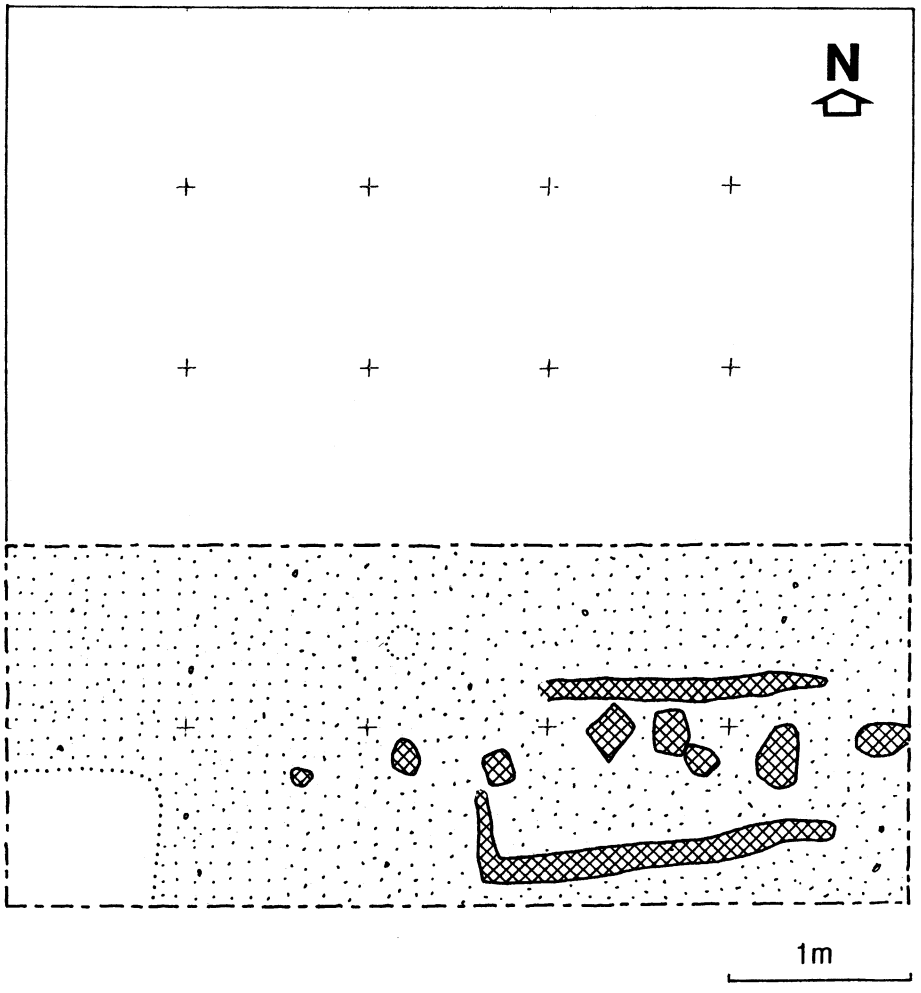


FIG. 3. SMC 96: plan of organic-filled features at 19.3 m SL.

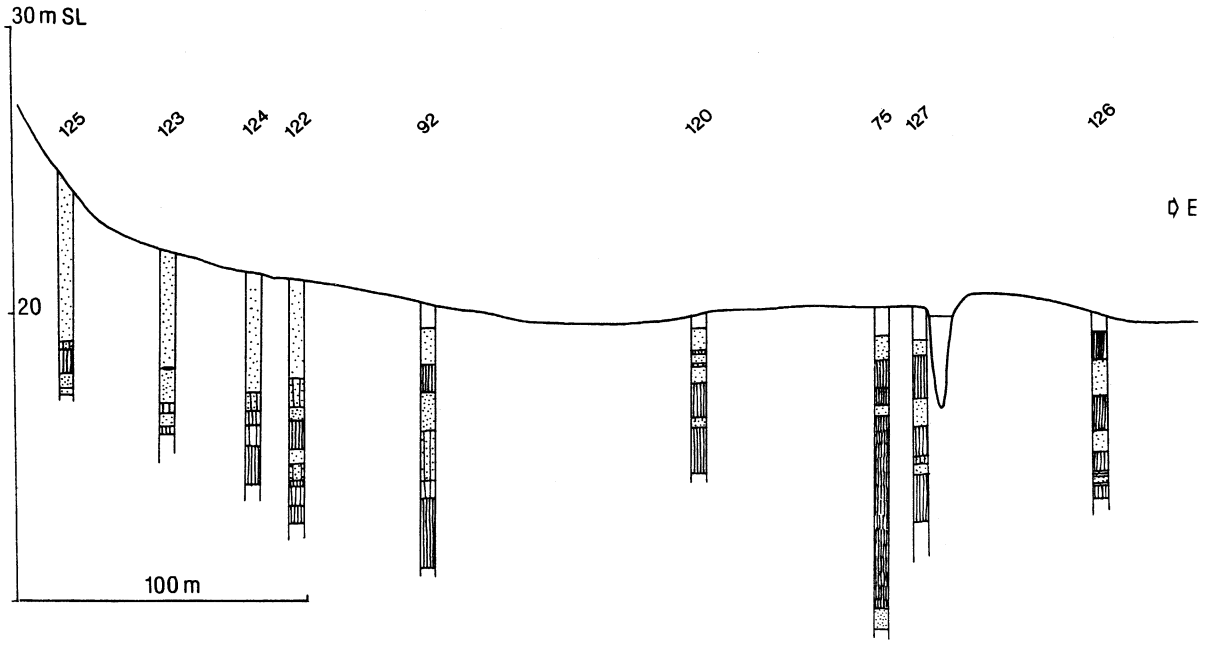


FIG. 4. Composite profile from past drill cores (75, 92) and 1996 cores 120, 122–127. Vertical scale exaggerated. Key to soils as for FIG. 2.

with-Ptah', described in the autobiographical inscription of his Great Steward of Memphis, Amenhotep Huy.[3]

Post-excavation work (Janine Bourriau)

Recording of pottery from the New Kingdom contexts was completed on schedule, and the opportunity to compare the Memphis material with Eighteenth Dynasty pottery from Thebes and Elephantine was particularly useful. Work on the blue-painted wares is also near an end, and a preliminary draft of the chapter on Cypriote and Mycenaean imports was revised. Work on pottery from Middle Kingdom (mid-Twelfth Dynasty) contexts continued, and the recording of a substantial Middle Kingdom corpus is now 25 per cent complete. Through the valuable comparisons with Tell Dabʿa, whose ceramic chronology is a point of reference both for Egypt and for the Near East in the Middle Bronze Age, we understand more clearly how our material differs, while also observing an overlap between some pottery types. The importance of such informal collaboration through exchange visits has been amply demonstrated again this season, and we look forward to similar arrangements in the future.

D. G. JEFFREYS, J. D. BOURRIAU *and* W. R. JOHNSON

[3]W. C. Hayes, *JEA* 24 (1938), 18–19.

Saqqara New Kingdom Necropolis

A season of study, recording, and restoration was carried out by the joint EES–Leiden mission in 1997. The fieldwork lasted from 3 January until 6 March. The staff consisted of Geoffrey Martin, Evgen Strouhal, Jacobus van Dijk, Julia van Dijk-Harvey, Barbara G. Aston, Ladislava Horácková, and Katja Goebs. Thanks are extended to Dr Zahi Hawass (Director General of Giza, Saqqara and Memphis), Mr Mohammed Hagras (Director of Saqqara and Memphis), Mr Magdi Ibrahim el-Ghandur (Chief Inspector of Saqqara), and Mr Khaled Ali Mohammed Osman el-Krety (SCA Inspector attached to the mission).

Restoration project

Major works of reconstruction were carried out under the supervision of Dr van Dijk in the newly positioned substructure of the tomb of Maya. Work was completed on the re-erection of reliefs in Room K, minor adjustments were made to previous work in Room O, and the original wall reliefs were removed from their location in Room H and brought to the surface without mishap. A promising start was made on the re-erection of the latter in the new substructure, which will be completed in 1998. Preparations were also made to take impressions of the five rock-cut stelae in the substructure of the tomb, preparatory to their being cut out and placed in their new location. At the same time the north wing of the pylon entrance of Maya's tomb was reconstructed practically from the ground up, and some minor rebuilding in mudbrick was carried out on the north and west walls of the outer court. A column, cast in sections in concrete, was erected in the courtyard to give an impression of the original appearance of the west colonnade.

Epigraphy

A facsimile record was made of the reliefs and inscriptions in Rooms K and O of the newly positioned substructure of Maya.

Pottery

Attention was focused on material from the underground complex of the tomb of Pay, excavated in 1996. The tomb had three phases of use: the original Eighteenth–Nineteenth Dynasty burials, followed by Saite and lastly Persian (fifth century BC). Only from the latest phase were any vessels found which could be completely reconstructed.

The New Kingdom pottery, recovered primarily from the burial chamber at the lowest (third) level, included a diverse collection of marl clay vessels. In addition to eight vessels with painted floral collars, the pottery team recorded large and small flasks with long necks and horizontal loop handles, a wide-mouthed jug with a single handle, and ten Egyptian-made amphorae of both pointed and carinated base types. The shoulder of one amphora bore a hieratic docket: *bnrw*, 'dates'. Many of the marl vessels still retained traces of their contents. Twenty-one large storage jars were also recorded from the lowest chamber, as well as plaster sealings in which one large plate had been broken up and used for each seal.

As well as the sherds from the tomb of Pay, small assemblages from the floor of the courtyard of the tomb of Raia, son of Pay, and from in and around the late New Kingdom shaft 96/1 were also dealt with.

Human remains

The elaboration of skeletal material from the tomb of the harim official Pay and his son Raia was completed this season. The bones in question derived from Room A and Shaft 1. Despite their fragmentary state and disturbed nature, it was possible to obtain valuable results by studying the totality of the material by the anatomical method, bone by bone, and making calculations according to a number of characteristic features.

Chamber A must originally have been tightly packed with burials, surprisingly as many as 210 at a minimum. Only one of the skeletons was found and excavated *in situ*, the other remains being dispersed. Almost 60 immatures (infants, children and juveniles), more than 90 adult males and some 60 adult females were discerned. There can hardly have been room for all these burials in Chamber A at the same time. It seems probable that fragmented bones from earlier interments were pushed aside to make room for new ones. According to the evidence of small finds and pottery, Chamber A was used from the Twenty-sixth Dynasty down to the First Persian Period (*c.* 664–404 BC).

The area at the bottom of Shaft 1 yielded the remains of 3 immatures, 6 adult males, and 4 adult females. Some or all of them could be parts of the same bodies as those found in A. The entire substructure of the tomb of Pay contained approximately 250 burials.

As regards the skeletal material found in the superstructure, the bones were dispersed. Thus they were studied only for palaeopathological purposes. The full elaboration of the rich variety of palaeopathological finds (traumas, degenerative-productive changes, inflammations, tumours, congenital anomalies, dental problems, etc.) will shed new light on ancient bone and tooth diseases present in the inhabitants of the ancient Memphite region.

GEOFFREY T. MARTIN

Tell el-Amarna, 1996–7

IT proved possible to organize two seasons, one in September–October 1996 and one in March–April 1997. The full staff comprised (for the former) Barry Kemp, Lucinda Clark, Jane Faiers, Alison Gascoigne, Odile Hoogzaad, Caroline Jackson, Patrick Gilbert, Rosemary Luff, Paul Nicholson, Gillian Pyke, Pamela Rose, Peter Sheehan, and Katherine Spence; and (for the latter) Barry Kemp, Ann Cornwell, Ian Dennis, Surésh Dhargalkar, Jane Faiers, Lucia Gahlin, Rainer Gerish, Patrick Gilbert, M. A. Leahy, Rosemary Luff, Michael Mallinson, John Muir, Gwilym Owen, Pamela Rose, Delwen Samuel, Margaret Serpico, and Katherine Spence. Thanks are due to the SCA and its Chairman Dr Ali Hassan and to Mahmoud Hamza, Samir Anis, Yahyia Zakaria and their colleagues in the inspectorates of el-Minia and Mallawi. The EAO was represented by Inspectors Helmi Hussein and Atta Makramalla Mikhail, assisted by Assistant Inspector Bassem Bahgat and Conservator Ahmed Abd El-Daim. Their assistance is gratefully acknowledged. The McDonald Institute for Archaeological Research at the University of Cambridge provided

the expedition base in the UK. The North Palace work was funded by the Amarna Research Foundation. Individual projects were supported by the Leverhulme Foundation, the G. A. Wainwright Fund, the Thomas Mulvey Fund, and Scottish and Newcastle Breweries. Grateful thanks for assistance are due to Richard Keen and Keminco (Cairo), Alf Baxendale and Cementone-Beaver, and the EES members in Cairo.

The survey of the Central City

The survey, which included the re-examination of the Small Aten Temple, was extended to the area south of the Great Palace, and to the pair of stone and brick buildings, O42.1 and .2, dug by Pendlebury in 1934 (see his *City of Akhenaten* III). Each was a pavilion constructed partly of brick and partly of stone on foundations of gypsum concrete. They lie side by side but on slightly different alignments, and (according to Pendlebury's plan) seem to be attached to the west wall of the huge pillared hall thought to have been built by Smenkhkara, which implies that they are of the same date, although the plan of the brick walls also implies that one pavilion was built subsequent to the other. If the pillared hall was built by Smenkhkara, then in Akhenaten's time the area must have looked very different: the ground must either have been an open space or the site of another building.

The complex of walls around O42.1 and .2 was an obvious place to start looking for evidence. By means of two broad strips of excavation, key parts were replanned (by Kemp and Gilbert) and the correct relationships of walls obtained (pl. I). The edge of the gypsum foundations for pavilion O42.1 was found to be in excellent condition. To its east the foundations of many walls planned in 1934 and belonging to pavilion O42.2 were relocated, together with several new ones, some from an earlier building phase and on the same alignment as O42.1. An entirely new feature is a brick pavement in front of O42.1 which serves to fix the original floor level, now considerably above the level of nearby fields. Several fragments of decorated stonework were found in Pendlebury's dump, one of them mentioning the 'House of Rejoicing'. From debris packed between the foundations of old and new walls came a number of fragments of painted gypsum floor.

An order of building was established, in which O42.1 came first, then O42.2, and finally the Smenkhkara hall. The most significant discovery was that pavilion O42.2 probably formed part of a building complex of Akhenaten's time which had extended eastwards across the ground later occupied by the hall. A long mud-brick wall attached to O42.2 ran into this area and was later crossed by the surrounding wall of the hall. More work is needed to explore this further.

North Palace

In the half century that has elapsed since it was first exposed the mud-brick walls have steadily decayed, to the point where repairs are essential. The expedition has now begun a programme of repairs and conservation, supervised by Surésh Dhargalkar. The first repairs were to the range of rooms on the north side of the garden court in the north-east corner of the Palace where the brickwork is in a particularly dangerous condition on account of the loss of timber beams originally set into it. Once gone, a deep groove is

left which weathering opens up, threatening to undermine and topple the brickwork above. Replacement with modern wood is not an answer, for experience has shown that, even with insecticide treatment, termites quickly reappear. Our chosen remedy is simply to fill the grooves with a mix of mud and gravel, inset slightly to preserve its different character.

In other places, where the lower parts of the walls are badly eaten into, greater intervention is required. We have found it necessary to add a facing layer of bricks, and sometimes a capping layer of mud and gravel to the top of the wall (pl. II). As far as possible the original brickwork has been kept, but in some places missing areas of wall have been replaced entirely with new brickwork. Repairs were also done on the staircase in the north-east corner where the treads had largely eroded away. By the end of the season all the rooms on the north side had been repaired except the central room (the Green Room). The brick pillar in the north-eastern corner room, where traces of paintings still cling to the surface and are protected by a wall of bricks and sand, was also left to a future occasion.

It was necessary to make a large number of new mud-bricks to the correct ancient sizes, using mud from the river banks and sand, which gave a firm result. Experiments were done with other mud mixes, using ash and animal dung.

The opportunity was also taken to continue a long-running scheme to publish a final report on the building. This required fresh and more detailed plans of the most important parts. Katherine Spence recleared the stone portal in the middle of the thick wall or pylon which divides the building into an eastern and a western part. More of the gypsum foundation layer was preserved than expected, and many more details were planned than in 1924. She also continued the outline replanning, concentrating on the south-eastern corner area. One part of the Palace that has barely been investigated before is the large central depression. A deep trench down the south side made it possible to follow the steeply dipping bedrock for 5·5 m beneath the present surface, into a flattish layer of silt. There was insufficient time to complete this probe, but it is planned to do so in a future season.

Small Aten Temple

Work continued from previous seasons under the guidance of Michael Mallinson as architect. The main task currently is to lay out the original stone sanctuary in new stone blocks, using as a guide the remains of the ancient gypsum foundations, which preserve a good part of the original plan. Using blocks from a local quarry, and corner blocks with torus mouldings cast in white cement, the aim is to complete the outline of the building to a height of two or three courses of blocks and then to fill the platform so created with sand and chippings from adjacent dumps. A large part of the pylon which crossed the building behind the colonnade has been completed. Between its towers had run a broad gateway, probably through a portal of massive sandstone blocks. Its two surviving fragments have been set in position on either side of the gateway. Inside the forecourt, six square areas have been outlined with blocks, to serve as bases for displaying a selection of the original sandstone drums from the colossal columns.

Two parts of the temple were examined for the first time (Lucinda Clark, Katherine Spence). One is the corner of a walled enclosure in the north-western corner of the

sanctuary court which does not appear on Pendlebury's plan. Its full extent is still disguised by the huge dump of excavated material on the north. An area of plastered and whitewashed floor survives, however. The other part investigated is the gateway between the two towers of the second pylon. At a deeper level than that reached by Pendlebury were the remains of a gypsum concrete foundation for stonework within the gateway.

Tombs

Peter Sheehan carried out the first stage of mapping the various buildings of the Christian Period in and around the area of the North Tombs. Gwilym Owen completed his photographic survey of the South Tombs, with pictures of a selection of the most complete texts, large-format photography of various subjects in colour and black and white, and some 35mm photography of the decoration and architecture. He also made a preliminary survey of the North Tombs with a view to continuing his survey next year.

Work at the field station

A broad range of material from previous seasons of excavation was studied, in particular the Eighteenth Dynasty pottery (Pamela Rose, Odile Hoogzaad and Ann Cornwell), Byzantine pottery (Jane Faiers and Gillian Pyke), Canaanite amphorae (Margaret Serpico), small finds from both periods (Lucia Gahlin), stone fragments, mainly architectural, from the Small Aten Temple (Alison Gascoigne), small finds from the glass kilns (Ian David), inscribed material (M. A. Leahy), charcoal from both periods with the identification of species (Rainer Gerisch), and fish bones from both periods (Rosemary Luff). The numerous soil samples from the Workmen's Village excavations were separated into their component parts by flotation and extensive collections of plant remains and related material were recovered by Delwen Samuel and John Muir. Studio photography of various categories of material was done by Gwilym Owen, in particular of Byzantine pottery vessels and decorated sherds, and pieces of statuary. Ian Dennis undertook the drawing to publication standard of objects connected with the Glass Project excavated in previous seasons.

Amarna Glass Project

During the autumn season Paul Nicholson and Caroline Jackson continued the experimental archaeology which is a necessary part of the Amarna Glass Project. The aim this time was the replication of the better preserved of two furnaces discovered at site O45.1, in order to determine better its function and the nature of the materials associated with it.

The size of the furnaces (internal diameter approximately 1.50 m) previously excavated at O45.1 has led some authorities to suggest that they could not have reached temperatures sufficient for the making of glass. Glass cullet (scrap) can be melted at temperatures below 1000°C, but to manufacture glass from its raw materials requires higher temperatures, between 1100°C and 1200°C. It is conventionally said to be extremely difficult to raise the temperature of an updraught kiln/furnace much above 1000°C.

The replica was oriented with its stoke-hole facing north to take advantage of the

prevailing wind. The brickwork was copied from the original, with the mud-bricks manufactured locally. Excavated evidence suggested that the furnace may originally have had a domed roof and a mud-brick dome was therefore incorporated into the replica. Three openings were built into the dome at ground level, and from these protruded small shelves to support the crucibles. The shelves and walls of the kiln interior (but not the inside of the dome) were mud-plastered, as were the above-ground portions of the exterior. Four crucibles were placed on the shelves: two tall, beaker-like examples on the west side, and two wide shallow crucibles on the east. The two shallow crucibles and one tall one contained a mixture of Amarna sand and the ash of seaweed, whilst the second tall crucible contained broken sherds from a green bottle. Seaweed ash was used as a substitute for the ash of halophytic plants from Egypt. A small amount of cobalt was added to give the mixture a blue colour. Thermocouples were placed beside the south-eastern crucible and by the western pair, protruding beyond the shelf. The first of these measured the temperature close to the crucible, the second gave the general air temperature above the fire on the west side. The ports were blocked with uncemented mud-bricks. The fuel used was timber (pine and two so far unidentified types) and palm fronds. The weight of fuel used was recorded during the firing. Firing lasted eight hours, during which temperatures in excess of 1100°C were achieved without difficulty. A small wall of loose bricks was built near the stoke-hole to funnel the breeze into the furnace, but no forced draught was necessary.

At the end of the experiment the bottle had melted, and had reached a temperature such that it was sufficiently liquid for gas bubbles to escape. This was not unexpected, since cullet melts at lower temperatures than do raw ingredients. The second tall crucible mostly contained frit, the reacted product of the seaweed and sand at low temperatures, but its lowermost part contained a poor quality glass. The south-eastern crucible was lost when it dropped into the ash. The more northerly crucible produced a good quality dark blue glass with very few bubbles or particles of unreacted material. This glass ingot was produced without the aid of a separate fritting stage, and implies not only that the ancient Egyptians had the technology to produce glass from its raw materials, rather than simply importing and re-melting cullet, but that they could produce it without a fritting stage. This might imply that the frit found in excavation is for use with faience or pigment rather than directly for glass, and is a particularly exciting and unexpected result.

As well as producing the glass and frit, the furnace also reproduced other features known from excavation. The first of these is the slaggy material (Arabic *khorfush*) with which the furnace was lined, and into which overheated crucibles might turn. The clay packed around the crucibles did in fact become *khorfush*. Where the crucibles sat on the mud-plastered shelf the plaster became a yellowish brown and its organic matter burned out. This closely replicated the enigmatic yellow plaster known from excavation at O45.1 whose original location and purpose were unknown.

This experimental work has done much to help us understand the technological processes taking place at O45.1, and will be the key to separating those aspects of production which belong to glass from those which are part of the faience- or pigment-making process.

Scientific analyses of samples of glass and related materials from site O45.1 at Amarna,

and of Egyptian glass in museum collections, continues at the University of Cardiff (Nicholson and Jackson, with the assistance of Walter Gneisinger).

BARRY KEMP *and* PAUL T. NICHOLSON

Mons Porphyrites

THE fourth season of work at Mons Porphyrites took place between 26 February and 10 April 1997. The project is sponsored by the EES in collaboration with the Universities of Southampton and Exeter and the Vrije Universiteit van Brussel. In the field we thank Mr Hussein el Afyouni of the Qena office of the SCA and his Inspectors Mr Ayman Hendi and Mr Mohammed Riad. The field team comprised Donald Bailey, Nick Bradford, Rebecca Bridgman, Sean Goddard, Catherine Johns, Jenny Mincham (Ford), Jill Phillips, Paola Pugsley, Wilfried Van Rengen, David Spencer, Roberta Tomber, Marijke van der Veen and Cathy Wouters in addition to the directors, David Peacock and Valerie Maxfield.

The season focused largely on excavation. At Badia, a heap of industrial debris inside the fort comprising burnt brick was investigated, revealing two curious circular brick structures of unknown purpose, dating to the early fifth century AD.

Excavations at the fort in Wadi Abu Ma'amel continued and a number of small trenches were excavated, each designed to focus on a particular issue. The line of a possible early palimpsest of the fort was investigated, showing the structures concerned to be of much later date than expected. *Sebakh* of the late second century suggested remodelling prior to this and underneath was a substantial wall, perhaps an early wall of the fort. At some point after the late second century the fort may have been extended to the east.

Two trenches were excavated in *sebakh* outside the fort. On the western side a dump associated with the northern annex was examined. It proved to be very rich in organic materials and in ostraca. A further trench was laid out to examine dumping on the eastern side, probably in a late period after the fort had been expanded in that direction. It comprised unpromising grey ash, but a small sondage produced about 200 ostraca, comprising a remarkable archive of bread orders. These open up the possibility of examining the daily distribution of bread, and hence personnel, throughout the quarries and settlements. Because of lack of time, it was impossible to complete the excavation this year, but it will be a priority in 1998, as the archive seems to be of immense significance in our understanding of the site.

A small trench was also placed in the *sebakh* of the north-west village in order to compare food remains and artefacts in a village with those in the main fort. There seemed to be very little difference, suggesting that a similar way of life was enjoyed in both types of settlement.

The most important survey work this year was a detailed appraisal of the north-west quarries. These are the most inaccessible and least known of the quarry mountains and it was possible to examine extraction technology with unparalleled clarity.

VALERIE MAXFIELD *and* DAVID PEACOCK

Qasr Ibrim, 1997

THE study season began on 18 January and ended on 13 March. The team consisted of Pamela Rose (Director, ceramic specialist), Lisa Heidorn (ceramic specialist), Alison Gascoigne (ceramic illustrator), Andrea Methner (ceramic illustrator), Peter French (small finds registrar), Adrian England (finds illustrator), and Helen Bland (archaeological chemist). The expedition was greatly assisted by Inspector Shazly Aly Abdel Azim, and Chief Inspector Mohl el Din M. Ahmed.

Ceramics

The season saw the completion of the study of ceramics from the 'Church on the Point', begun in 1996. The Church and monastery form an isolated building complex outside and overlooking the hilltop fortress of Qasr Ibrim, and both were excavated by Martin and Birthe Biddle between 1990 and 1995. Their work demonstrated that the Church and monastery had a complex architectural history, and that the buildings underwent many alterations during the course of time. The Church eventually fell into disuse, but parts of the building were later reused as a mosque. A detailed examination of the sherds from the earliest deposits in the church complex indicates that occupation began in the earlier part of the Early Christian Period, although the heaviest use was in the later part of that period, in the eighth to tenth centuries AD.

There were two main elements to the study of the pottery. The first was to complete the drawing of significant diagnostic pieces extracted during the 1996 season, and to annotate these drawings with notes pertaining to fabric, technology and decoration. Over 600 drawings were made this year, which, when added to a similar number from the previous season, will constitute the best corpus of Early Christian Period pottery from Lower Nubia currently available. Several new forms were identified, some of which are without parallel from contemporary Nubian sites. The second task was to undertake a major refitting exercise to identify sherds belonging to individual vessels, and from their various archaeological contexts to look at their dispersal across the site. Even at this preliminary stage, it is clear that pieces of a single vessel could be very widely spread. Whilst this means that in many cases it is not possible to identify the original place of usage of a vessel, the information gives an insight into site formation processes and the rubbish disposal practices of the monks.

The types of vessel in use in the Church and monastery consisted most commonly of open forms, bowls and dishes, that is, pottery probably used for serving food or for display. These were commonly decorated with simple geometric designs, such as bands and festoons, and a few vessels had rims or applied clay bands with 'piecrust' indentations. A few sherds come from vessels with large stamped motifs as decoration, which include clearly Christian symbols. Forms otherwise without parallel include what seems to be one or more large jars with holes cut out of the walls, long cylindrical vessels with applied piecrust decoration, and a range of small potstands. The vessels, which appear to be of local Nubian origin, are well made and finished, and seem to be of a better quality than the pottery from contemporary occupation levels in Qasr Ibrim itself was. This, along with other evidence from the site, suggests that the community living around the Church was considered to be of high status.

Lisa Heidorn spent part of the season completing her study of pottery of the Napatan Period from Qasr Ibrim. This material comes from a number of different locations within the fortress where excavation has penetrated into early deposits, although remains of this period have not yet been the focus of extensive excavation. The material studied adds to that already documented from the site from area 12000, and appears to date from the second half of the eighth, or early seventh, century to perhaps as late as the fifth century BC. Recent publications of Egyptian and Nubian pottery of the early first millennium BC will undoubtedly help better to date the ceramics, but it is also hoped that the Qasr Ibrim material, much of it from well-stratified contexts, will contribute to the knowledge of ceramic development in Nubia during the Third Intermediate Period and the subsequent period covered by the Twenty-fifth and Twenty-sixth Dynasties.

Residues research

Helen Bland's work focused on the study of residues preserved either as visible remains on the surface of pottery vessels or in their walls, which study forms part of her doctoral research. The vessels came from deposits ranging from about the first century AD through to the mediaeval period, and include amphorae, cooking vessels and lamps. Much of her work was carried out in the Department of Environmental Sciences of the South Valley University, thanks to the kind co-operation of Prof. Ahmed Esmat Belal. About 150 samples were extracted from the vessels, analysis of which is currently underway. It is hoped that the identification of the substances contained in the various vessels will give important information on the subsistence economy of the inhabitants of Qasr Ibrim through time.

Study of objects

Peter French and Adrian England spent three weeks at Shellal, cataloguing, drawing and photographing small finds from previous excavation seasons, principally 1992. About 130 objects were recorded, mostly relatively minor pieces, but including several leather items found crushed or folded. These were relaxed and flattened out as far as practicable. Study of the beads, of various materials, mainly glass and faience, was also completed, and more than 700 examples were added to the series. A bead corpus can now be prepared. With the exception of the beads, almost all the objects were drawn, together with a number of X-Group and Christian stamped jar sealings previously catalogued but not drawn. Almost all the objects were photographed.

PAMELA ROSE

Ground south of the Great Palace. Foundations of walls of buildings O42.1 and .2, view to the south. Note the edge to the gypsum foundations of O42.1 on the right

TELL EL-AMARNA (pp. 8–13)

PLATE II

Conservation at the North Palace, showing a stage in replacing rotted bricks with new bricks

TELL EL-AMARNA (pp. 8–13)

THE NATIONAL MUSEUMS OF SCOTLAND SAQQARA SURVEY PROJECT 1993–1995

By IAN MATHIESON, ELIZABETH BETTLES, JOANNE CLARKE, CORINNE DUHIG, SALIMA IKRAM, LOUISE MAGUIRE, SARAH QUIE and ANA TAVARES*

The National Museums of Scotland is engaged in producing an up-to-date archaeological and sub-surface geophysical map of an interesting and little explored area of the necropolis of Memphis at Saqqara. The area concerned comprises the Gisr el-Mudir (also known as the 'Great Enclosure') at the southern boundary, the open valley between the Sekhemkhet complex and the Gisr el-Mudir stretching north to the Serapeum and containing the L-shaped enclosure at the Old Kingdom tombs around the mastaba of Ptahhotep, the area of the Serapeum and its dependencies and the valley to the north-west of the Sacred Animal complex down to the edge of the remnant lake at Abusir in the north. Structural details, ceramics, archaeological contexts, human and animal skeletal remains from sondage trenches excavated to confirm geophysical anomalies are described and discussed.

THE last report of our work was published in 1993.[1] That report finalized the record of preliminary accounts of the fieldwork and archival research to date, to the end of the 1992 season. The conclusions to that report explained that work would continue on the geophysical survey but in addition, sondage trenches would be explored to confirm anomalies found during the sub-surface survey. This constitutes the final report for the 1993–95 seasons. The National Museums of Scotland acknowledge with gratitude the help and co-operation of the Supreme Council of Antiquities of Egypt in granting permission for the work at Saqqara, especially that of the present Chairman, Dr Ali Hassan, past Chairmen, Prof. Dr Abd el-Halim Nur el-Din and the late Drs Ahmed Kadri and Sayed Tawfik, and the ever generous help of the Secretariat at Abbassiya, especially of Mme Samia. They are also grateful to Dr Zahi Hawass, Director of Antiquities for the Giza region and to the Director for Saqqara, Mr Mohammed Hagras, his predecessor Dr Yehia Eid, Mr Magdi el-Ghandoor, Chief Inspector, and the SCA field inspectors, Messrs Sabri el-Din Farag, Said Farag, Abdel Hamid Rehan and Hazim Said for their courteous assistance and collaboration on site. The work was made possible by grants from the British Academy, the National Museums of Scotland, the Trustees of the Gerald Averay Wainwright Fund (Oxford University) and the Clydesdale Bank; assistance in map reproduction has been contributed by Survey and Development Services, Bo'ness, West Lothian.

The locations of survey lines, structures, tombs and sondage trenches are based on local triangulation schemes laid out by the Survey of Egypt, Cairo University Engineering

*Ian Mathieson and Prof. H. S. Smith are co-directors of the project, and all authors wish to thank Prof. Smith for his kind help and advice. Other contributors are: Ana Tavares (archaeological field director), Elizabeth Bettles (archaeological site supervisor), Joanne Clarke and Louise Maguire (ceramicists), Corinne Duhig (human skeletal remains), Salima Ikram (animal skeletal remains), and Sarah Quie (archival research). Other contributions are acknowledged in the text.

[1] See I. J. Mathieson and A. Tavares, *JEA* 79 (1993), 17–31.

Department and the Egyptian Exploration Society, all of which have been reduced to the UTM Grid (Universal Transverse Mercator Grid, Projection-Hayford 1909 International Ellipsoid), which is the base for the topographic map sheets produced in 1978 for the Ministry of Housing and Reconstruction (MHR 1978) at a scale of 1/5000. It is from these map sheets that the basic topographic features, including elevation data, used by the NMS Saqqara Survey Project are obtained. Sondage trenches are named according to the geophysical profile number and electrical anomaly located thereon, with the excavation grid axis in line with the profile. The basic recording system is a series of numbers applied to debris, layers, walls, etc. with a grid reference supplied; on plans and sections the context number appears in a circle and when referred to in text, in square brackets.

Gisr el-Mudir: work carried out in 1993 (fig. 2) (Site supervisor: Ana Tavares)

At the time of building the Gisr el-Mudir would have been a massive construction project and even today still looks very impressive despite extensive use as a quarry. The Gisr el-Mudir is approximately twice the area of the Djoser enclosure and four times the area of the Sekhemkhet complex, its closest neighbours. By the end of the 1992 season the resistivity cross-sections across the monument in an east–west direction had been completed and the anomaly indicated in the 1990 survey which was located at the south-west end of the assumed South Wall had been investigated.

It was decided in 1993 to test the results of the resistivity data by sondage trenches over the previously discovered anomalies. This would allow for a calibration of the recorded data against the actual material seen in the sondage trench. Four areas on the main anomaly were chosen by study of the resistivity profiles and local topography. These areas were designated anomaly A7a, b, c and d, as shown on fig. 2. The geological and geophysical discussion covering these areas will be part of a future article reporting on the earth science and topographic content of the NMS Saqqara Project.[2]

On the north side of the assumed South Wall ridge, a fall in resistivity led to the investigation of an area where traces of mud-brick can be seen on the surface. Sondage A7c (fig. 2, pl. III, 1; area 15 m × 20 m) revealed a feature consisting of one course of mud-bricks laid directly on the desert surface, which in this area is a stratum of coarse reddish-coloured breccia-type material forming a slightly concave east–west basin. The feature was fully exposed showing a *pavé* one brick thick roughly laid with headers (north–south) and occasional lines of stretchers. The latter still formed a well-preserved edge at the south-west corner but the feature is severely eroded in the north-north-west to a trace of brick dust or to less than half a brick in thickness. The bricks are small (26 × 12 × 8 cm; pl. III, 2), light grey in colour and of a fine silt with some sand and no obvious inclusions. This is unlike settlement bricks which show a high percentage of pottery and organic material used as temper. The size and composition suggests that these are Archaic bricks especially fabricated for funerary monuments.

The brick feature was overlaid by a layer of dark grey brickdust in a distinctive matrix of orange sand and fine white gypsum, which consists of decomposed local limestone similar to the type of material excavated from circular pits in sondage A7d (fig. 2). This deposit sealed the full extent of the brick feature which was completely exposed, but due

[2] I. J. Mathieson and J. Dittmer, forthcoming in *JEA*.

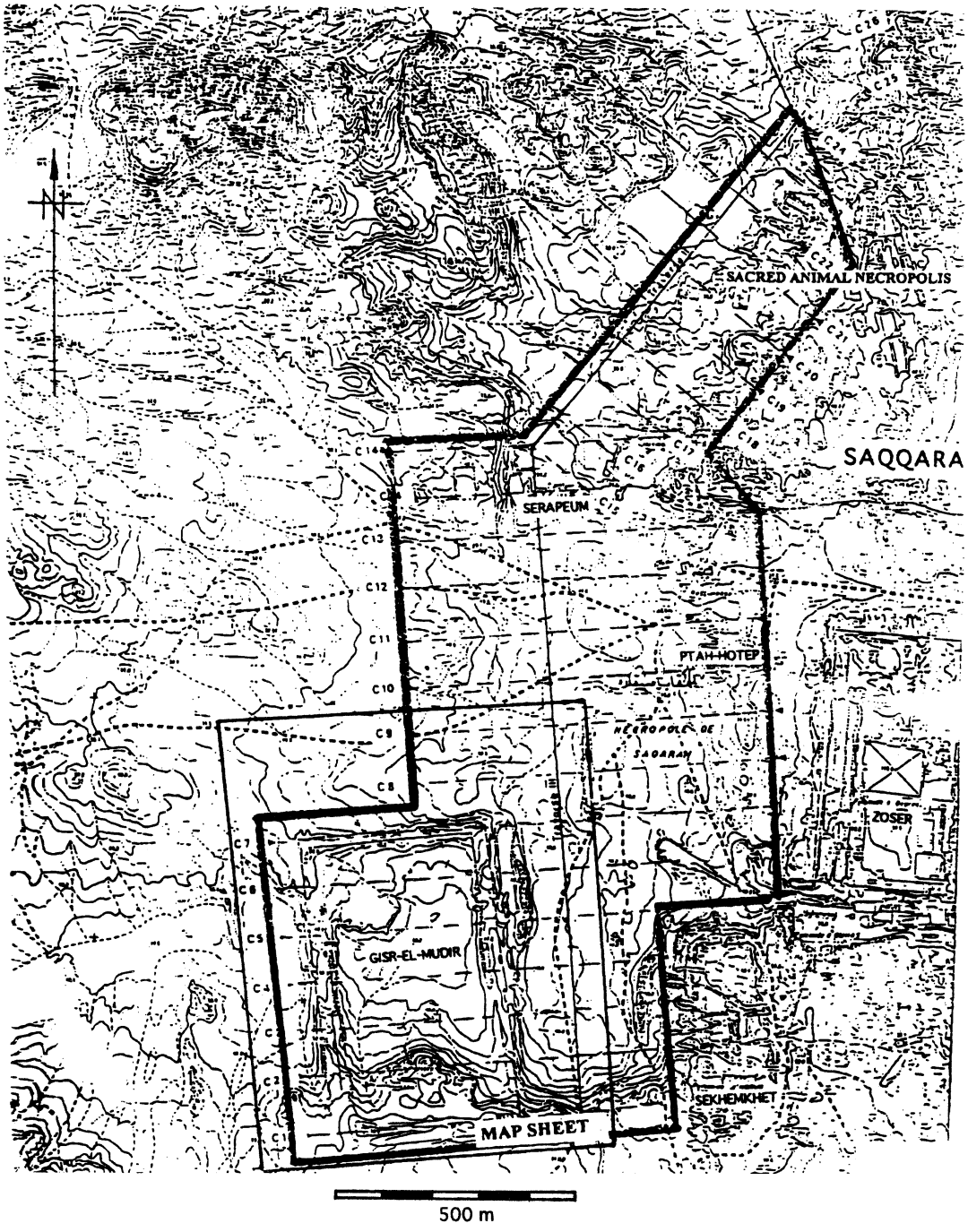


FIG. 1. National Museums of Scotland concession area.

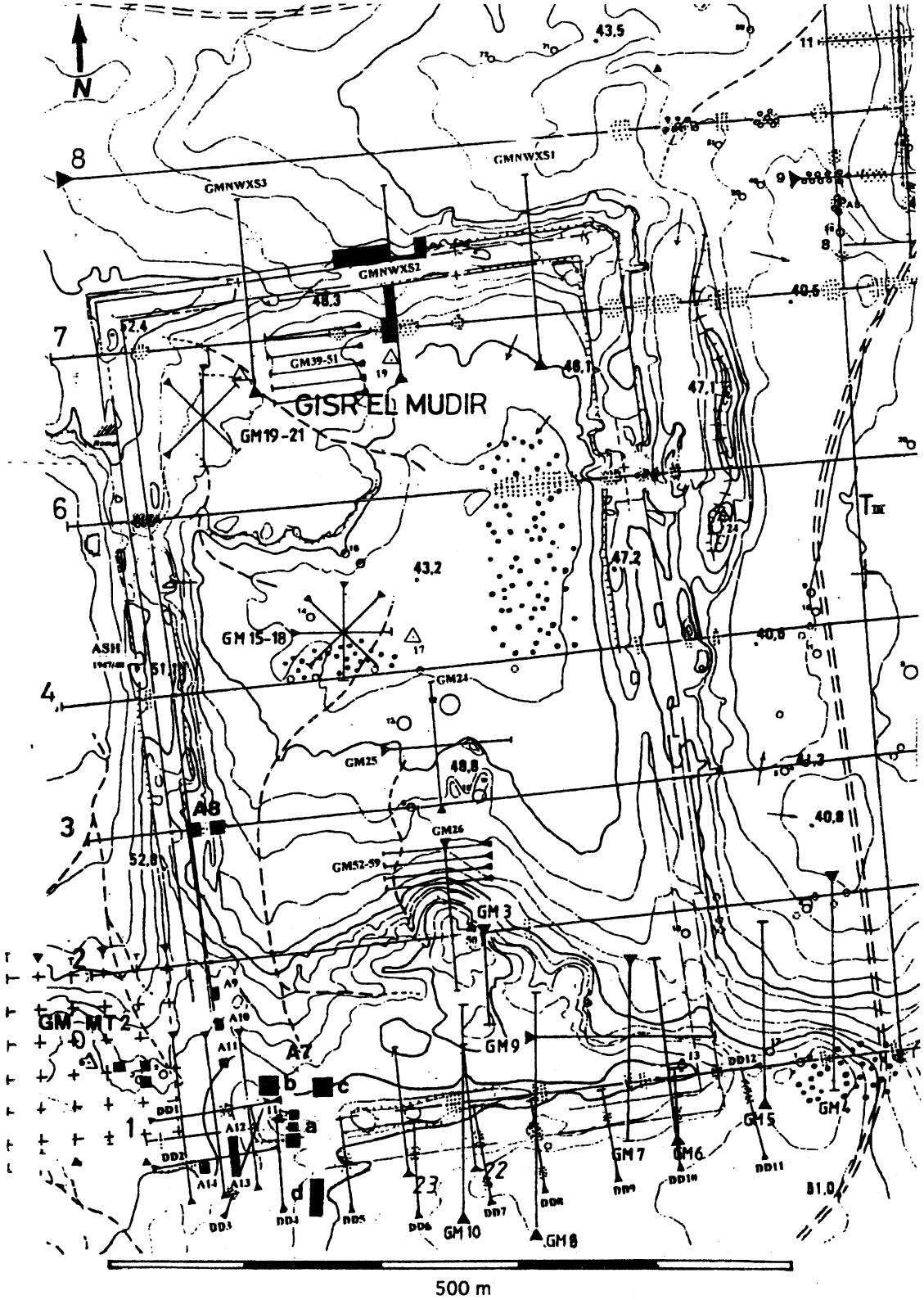


FIG. 2. Gisr el-Mudir enclosure.

to erosion and probable robbing, the original shape is unknown. On the east the natural surface of the desert has been cut down and prepared, with the brickwork running up to the cut and then continuing at a higher level, although still only one brick thick. The difference of level was disguised by a single half row of stretchers forming the only area where two brick courses appear to have been laid (pl. III, 2). The bricks in this area are fragile and eroded, with no trace of the coarse sand mortar present elsewhere (fig. 3).

The central and southern part of the feature was covered with a thin, hard, compacted mortar with irregularly spaced ridges 20 cm to 60 cm apart, 3 cm high by 10 cm thick, which wander across the surface in an east–west direction. As it seems clear that the feature did not support a building (there are no traces of walls or edges), it may be that this is an aid to construction and that the ridges and the mortar covering are explained by the movement of heavy objects across the surface. The extreme hardness of the mortar and ridges could be the result of the compacting of liquid mud poured in front of sledges or some other form of transport (fig. 3; pl. III, 1). Examples of Egyptian mud slipways,[3] and mud-brick building ramps, do not seem directly comparable, although recent work at Giza and experimental archaeology may shed light on this feature.

Sondage A8WW (Site supervisor: Ian Mathieson)

Some 200 m to the north of the south-west corner (resistivity cross-section GM90-XS3, fig. 1) there was a rise in resistivity values as the profile approached the assumed position for the east face of the West Wall of the monument. This suggested that the wall comprised east and west faces of masonry and that the intervening space was filled with a conductive material. The presence of the West Wall was previously known from photographs of unpublished work by Abdel Salam Hussein (the original 'Mudir'?), the Director for the Egyptian Antiquities Service in 1947, but its character, construction and dimensions were unknown. Sondage A8WW was opened to explore this area. The excavation confirmed the data recorded and an impressive section of wall was exposed standing to a height of 3.2 m, in twelve courses of limestone masonry (fig. 4; pl. IV, 1). There was a specially prepared hard-packed sand deposit which formed a level buttress 1.5 m deep against the east face of the wall, and it appeared to continue to the north and south of the trench. The top five centimetres of this fill was compacted and had numerous mud-brick and limestone fragments embedded in such a fashion as to lead to the conclusion that in addition to buttressing the lower courses, this had formed a pavement or inner platform to the east face of the wall. There was no apparent foundation trench, the base course being laid on the level desert surface. This level pavement extended outward from the wall for a distance of 25 m, where it merged with the natural desert surface (fig. 4). The fill had also protected a much harder, grey-coloured plaster which had been used to face and protect the bedding mortar between the stone blocks of the wall face. This mortar was thick and composed of fine sand and mud.

The roughly-dressed facing blocks which batter at approximately seven degrees towards the centre of the wall are supported from behind by further undressed blocks set in fine sand, forming a buttress to the facing and sloping towards the centre of the wall (fig. 4). If it is assumed that the west face is constructed in a similar manner, then the builders produced a pylon-shaped construction with masonry walls 15 m apart,

[3] See A. Vila, in J. Vercoutter, *Mirgissa* I (Paris, 1970), figs. 11–20.

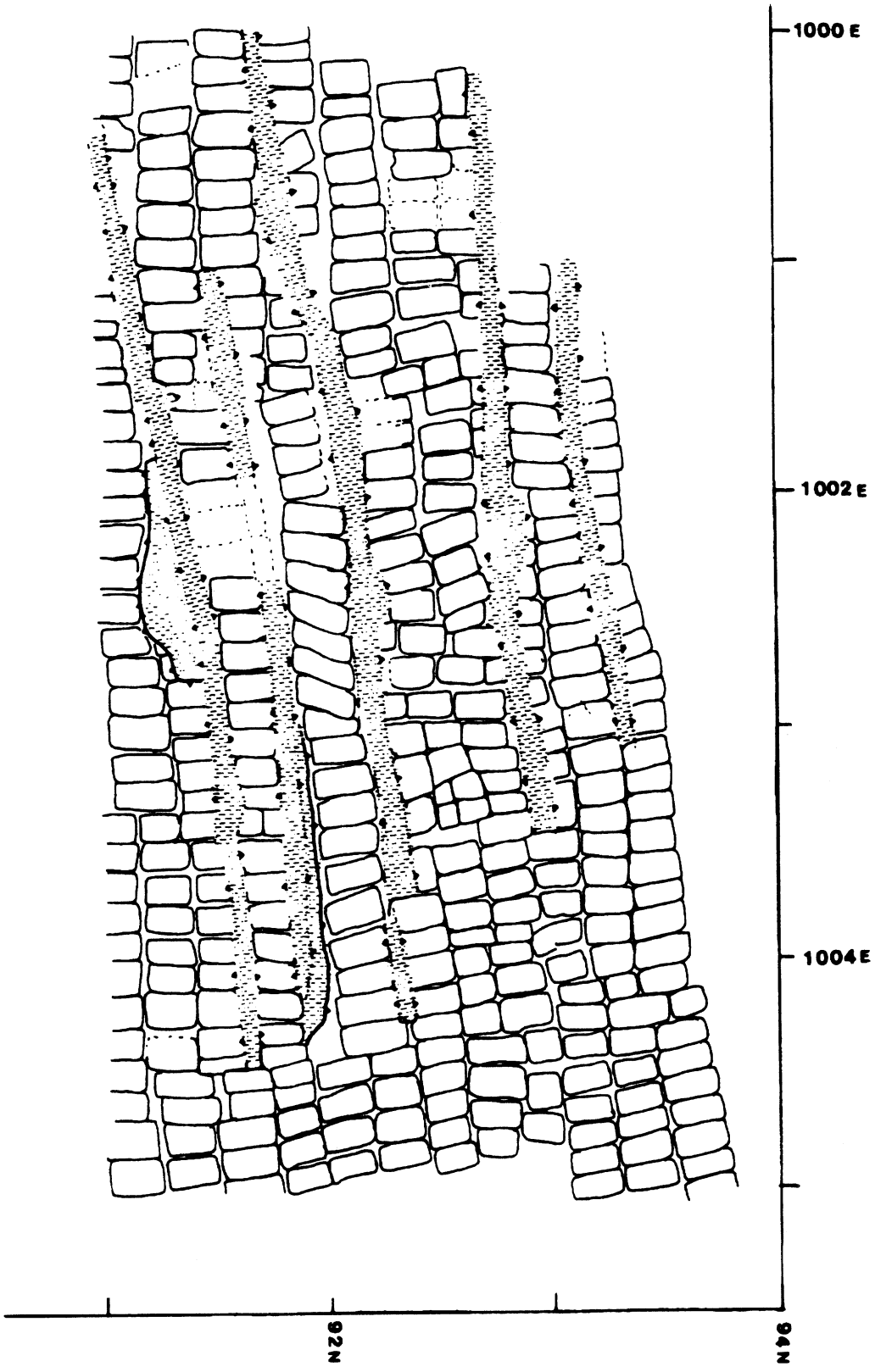


FIG. 3. A7c brick articulation and mortar ridges.

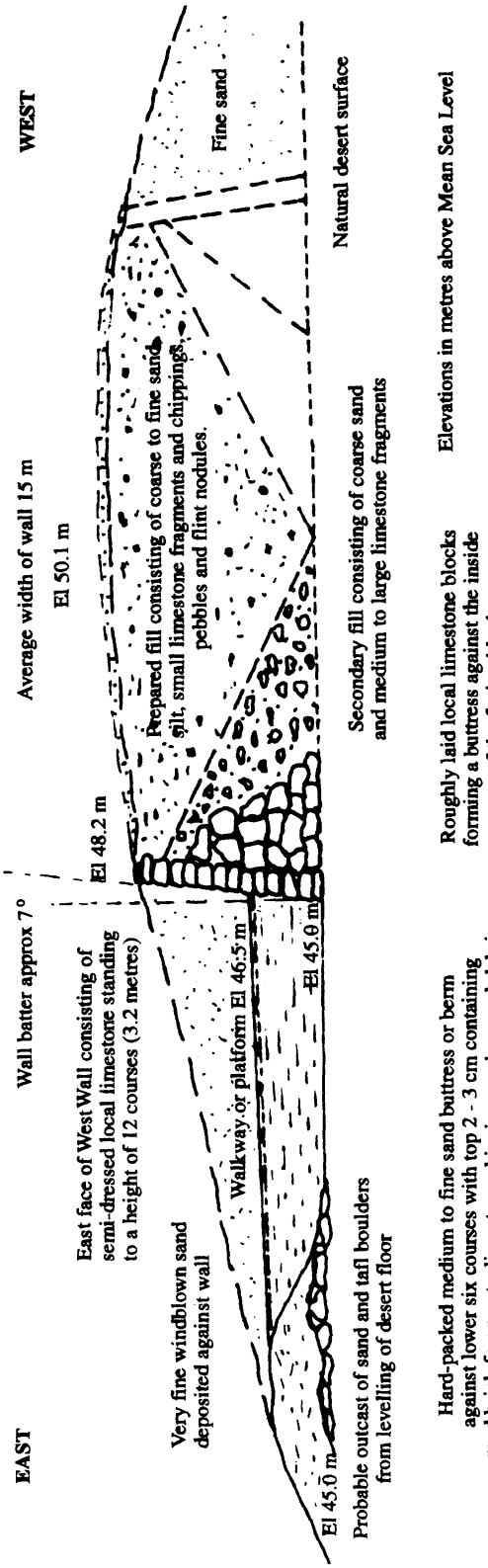


FIG. 4. Diagrammatic section of West Wall at anomaly A8 (FIG. 2).

buttressed on the inside by further masonry and the central portion filled with a prepared material made from mud, limestone fragments, sand and flint nodules. Once again the resistivity results were confirmed, as this material is low in resistance and shows clearly on the profiles. These features, together with the failure to trim away soft *tafl* layers in the limestone and the irregular laying of the blocks (so that the masonry joint on one course was not centred between an upper and lower course block), probably contributed to the collapse at the southern end of the exposed wall (pl. IV, 1). Several mason's marks and graffiti were found on this wall face.[4]

Gisr el-Mudir: work carried out in 1994 (fig. 2, GMNWXS2) (Site supervisor: Elizabeth Bettles)

During the 1994 season, a sondage was made in the area of the North Wall of the Gisr el-Mudir. Previous resistivity surveys along the sounding GMNWXS2, Easting 326640, had detected anomalies to the north and south sides of the wall. The results of the sondages in this area revealed a) the North Wall with an appending structure on its north face, and b) a cemetery of simple rock-cut and surface sand burials.

The North Wall of the Gisr el-Mudir

The North Wall of the Gisr el-Mudir is located on top of a ridge running east–west, which gently slopes up one metre above the surrounding area. The wall itself measures 13.90 m wide at its base and has a present-day maximum height of over 2.20 m (fig. 5). The original height of the wall could not be ascertained because of past stone-robbing activities. The facing blocks consist of undressed pieces of limestone, variable in size, though cut roughly to the same width (25-30 cm), the quality of which is poorer than Tura limestone. The extant south face reaches a height of six courses, whilst seven courses remain on the north face (pl. IV, 2). Between the limestone blocks there is a plentiful application of mortar made of mud mixed with small limestone flakes and desert pebbles, to cement the uneven blocks together. The faces of the wall have a batter of six to seven degrees sloping inwards.

At grid reference N305720, E326618, stone-robbers' activities have exposed the interior construction of the North Wall. Up to 0.5 m of rubble mortar overlies limestone blocks which had been carefully articulated and laid in courses. These good quality blocks are of variable length and width (50–100 cm long and 30–60 cm wide), but are regularly 26–29 cm in depth (pl. V, 1).

Occasionally portions of mud-brick are incorporated into the filling. These bricks are made of pure dark grey silt with no organic or mineral inclusions, the most complete example measuring $12 \times 12 \times 7+$ cm.

In the preparations to erect the wall the builders had scraped the bedrock to level the surface, exposing the greenish colour of the soft *tafl* (calcareous desert clay) bedrock [31]. At the south face a shallow foundation trench a few centimetres deep had been cut into the bedrock in readiness for the blocks of the lowest course. This trench extended 18 cm from the wall face. In order to set the lowest blocks firmly in place, a mixture of

[4]The mason's marks and graffiti found during the NMS Saqqara Project will be the subject of a separate publication.

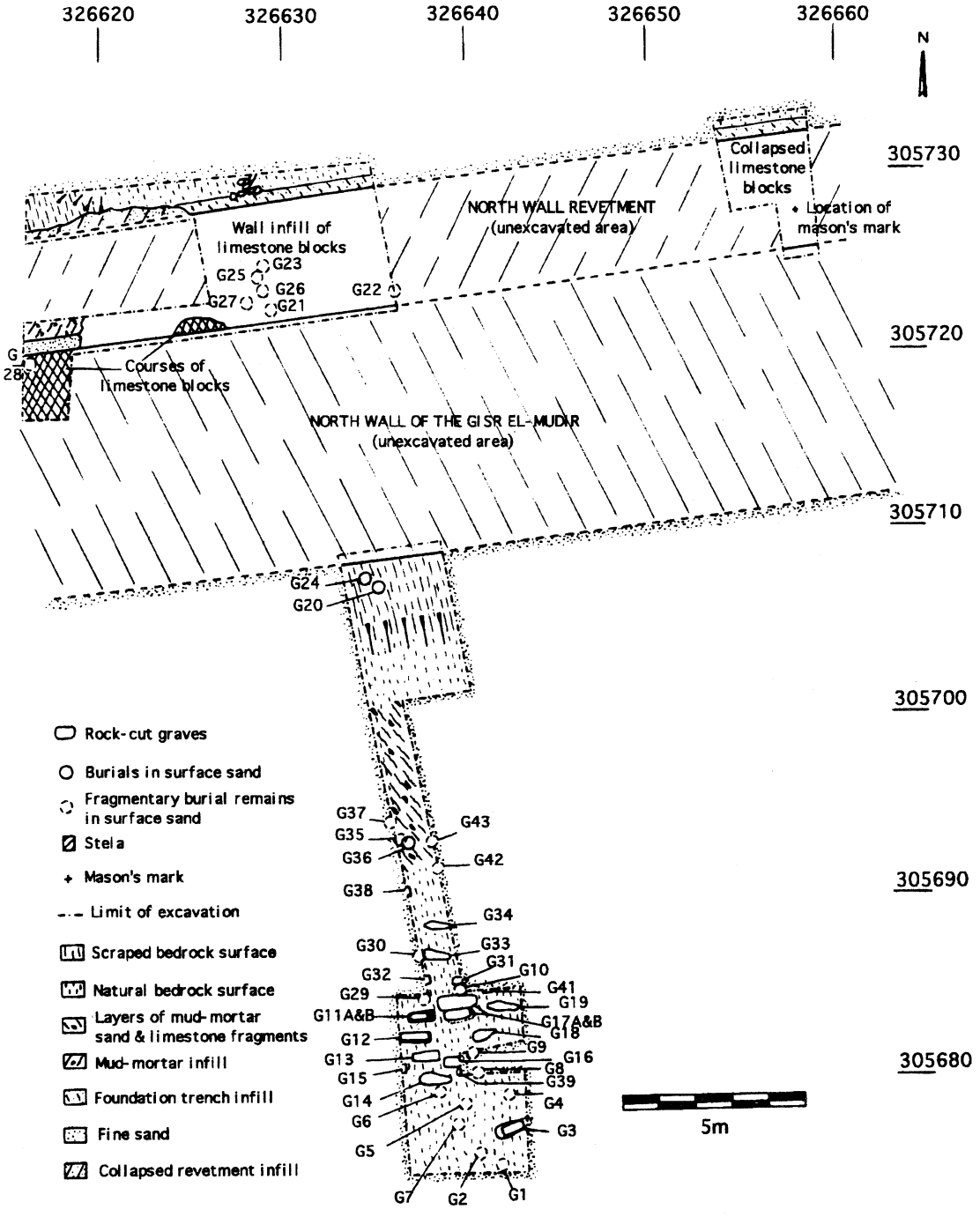


FIG. 5. Plan of sondages at the North Wall of the Gisr el-Mudir.

mud mortar, sand, limestone flakes and crushed *tafl* was poured into and over the hollow and compacted to create an exceedingly hard matrix [30]. This formed a kind of platform, reaching as far as the top of the first course (26 cm) and stretching back 4.40 m from the face of the wall (fig. 6). At the base of the north face the depth of this foundation trench was much greater (36 cm), allowing the lowest two courses of the wall face to be inserted into the bedrock.

On clearing collapsed rubble to the north of the wall the excavators were surprised to uncover courses of masonry which extended northwards 6.6 m and ending in another wall face. This apparently forms some kind of revetment against the main North Wall (fig. 6). The infilling of this structure consists of regularly-laid limestone blocks cemented with mud mortar, with a tendency for larger blocks to be positioned in the lower courses. The masonry lies against the face of the main wall, indicating a later date for this structure, although the method of construction resembles that found in the main wall (pl. V, 2). The extant north face of the revetment reaches a maximum height of only four courses, with a gentle batter of six degrees sloping inwards towards the main wall. The revetment facing blocks are set in a foundation trench 55 cm wide which has subsequently been filled with a compacted mud mortar [109] similar to that noted at the south face of the North Wall [30] (fig. 6). Occasionally pieces of mud-brick with organic inclusions are incorporated in the wall infilling. The most complete example measures $18 \times 12 \times 20+$ cm.

Westwards at grid reference N305725, E326619, the fill of this structure changes from stone masonry to become a solid area of thick mud mortar incorporating limestone fragments up to 30 cm long and handfuls of organic material (straw/palm fronds), usually cut into 3 cm long strips. This mud conglomeration, standing about 1.5 m high on the bedrock and extending for a length of 2.5 m to the edge of the excavated area, does not touch the north face of the main wall. There is a gap of a metre between it and the wall face, which is filled with fine sand (pl. V, 2). One can surmise that stone-robbers made this gap in order to gain access to the masonry at the north face of the main wall. It would have been easier to hack away this mud conglomeration than to remove the compacted stone masonry characteristic of the revetment fill which adjoins the face of the North Wall in the rest of the excavated area. Indeed, such an attempt had obviously been made 6 m to the east of this locus, where a hollow had been created by robbing activities in the masonry fill where it abuts the north wall face, but with few casing blocks extracted.

The purpose and the original form of this revetment remain enigmatic. Because of its much-robbed state, its original height cannot be ascertained, nor are there any distinctive architectural or decorative features. No objects or pottery in sealed contexts were encountered which could give an indication of date. A mason's mark was discovered on the smooth face of a stone amongst collapsed masonry in the revetment in grid reference N305727, E326658, although it is possible that this stone had fallen from the face of the main North Wall and may not be from the revetment itself.

Another puzzling feature is the layers of rubble and mortar to the south of the North Wall. An accumulation of aeolian sand [53] had banked up in layers against the south face of the North Wall, extending southwards and overlying the bedrock. At a point over 8 m from the south face of the wall, on the sloping surface of the aeolian sand, is a substantial layer of limestone fragments which are up to 30 cm in length [162] (fig. 6). These are

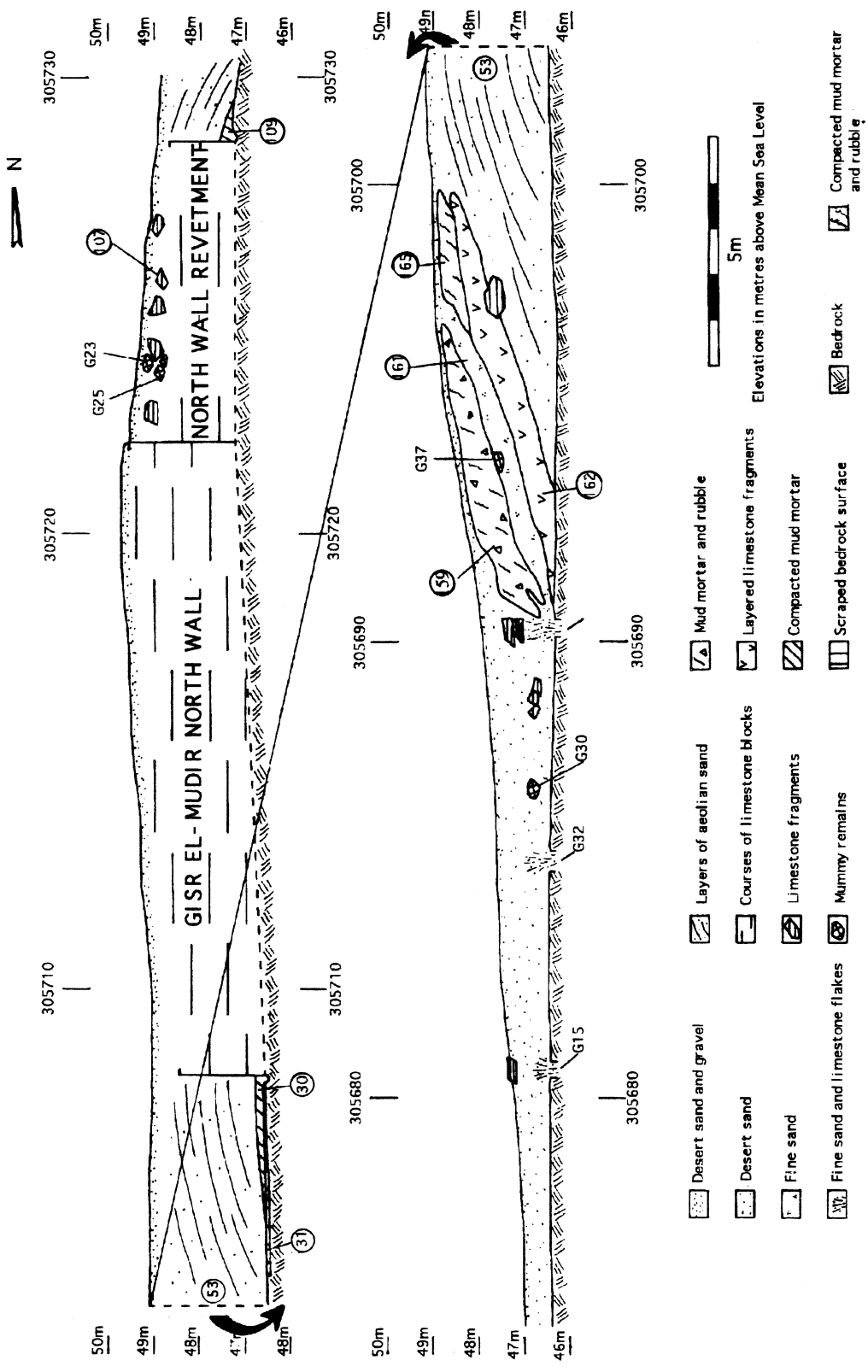


FIG. 6. Section of sondage GMNWXS2 from the east.

very angular, as if they have been flaked off larger stone blocks. Above these fragments is a layer of extremely hard and compacted mud mortar incorporating limestone pieces up to 25 cm long [165]. Less than a metre to the south of these contexts, and overlying the southern extension of the limestone pieces [162], is a layer of fine sand [161] about 0.50 m deep, above which lies a further accumulation of rubble with mud mortar and limestone flakes [159]. The substantial amount of mortar and rubble in this locality certainly suggests some fairly large-scale or prolonged activity, but its nature is unclear. In all probability it is associated with a period of destruction of the North Wall, but the 8 m stretch of sand between these contexts and the south face of the wall suggests that it is not due to a collapse of the North Wall infill after the facing blocks were removed, as is seen at the south-west corner of the Gisr el-Mudir enclosure (see 1995 report below).

As these layers of mud mortar and limestone pieces overlie the deep aeolian sand [53] which has banked against the face of the North Wall, this activity must post-date the construction of the wall by some span of time. Of significance to the dating of the sand [53] was the discovery of pieces of a broken water jar in a heap on context [30] at the base of the south face of the wall. This jar has been dated to the Archaic/Old Kingdom period (see p. 38). Furthermore, the remains of mummy wrappings (G37 and G43) were noted in the sand [161] between the layer of limestone pieces [162] and rubble and mortar [159] (figs. 5 and 6) and, in the east section of the sondage, mummy wrappings (G42) could be seen poking out of the rubble and mortar context [159]. The location of these remains indicates that activity relating to the cemetery post-dates the deposition of the limestone fragments [162] over the aeolian sand; if G42 was truly remains of a burial *in situ*, then this shows that the cemetery belongs at the end of an era of wind deposition of sand and after some activity of destruction.

The Cemetery

On examination, an anomaly noted in a resistivity survey 30 m south of the south face of the North Wall proved to be shallow, sand-filled, rock-cut graves (figs. 7 and 8; pl. VI, 1). There are indications in 38 loci in this area of complete or fragmentary remains of burials (each locus has been given a separate number, labelled on plans and section as 'G' followed by its number). Fourteen loci consist of partial skeletal remains with mummy wrappings in the surface sand, which could have been scattered from grave disturbances in the area; three consist of mostly complete, but very friable, mummies deposited 30-75 cm below the sand surface level; and, as mentioned above, G42 was noted within a mortar and rubble context. The remaining 20 are graves, oriented east–west, cut into the soft *tafl* bedrock. They are 0.5–1.0 m deep and either rectangular or anthropoid in shape.

Of these rock-cut graves, a sample of eight was chosen to be cleared of their sand infill for closer examination (G3, G11A/G11B, G12, G14, G17A, G17B, G18, G19). The mummies within these graves were not removed, unless they were in a very fragmentary state, to allow for future study. From the location of the graves far from the more prestigious and congested localities in the cemetery to the east and from the simplicity of the graves themselves, it appears that this is a cemetery for poor people. Very few objects and no pottery were found in clear association with the burials. There is some

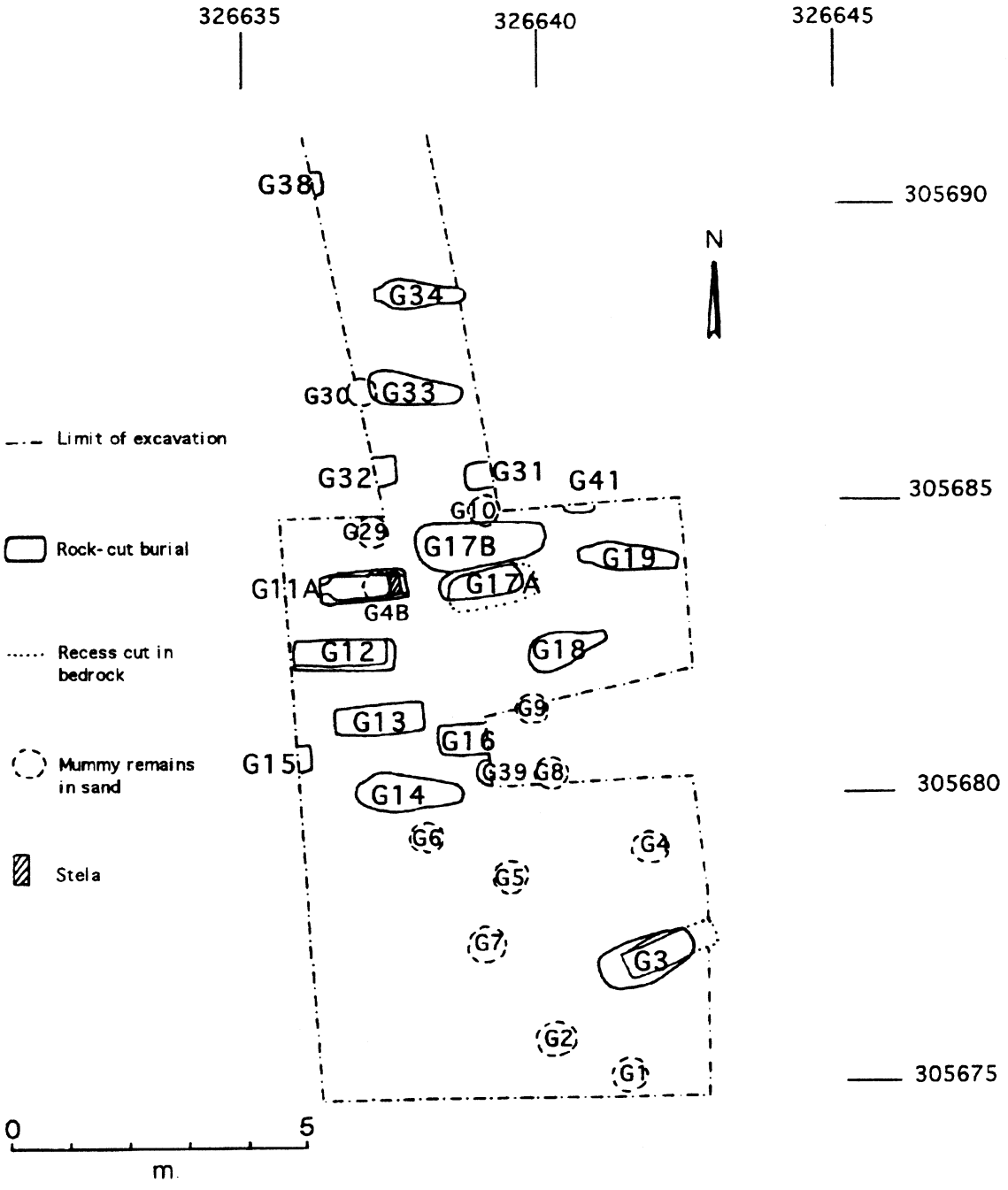


FIG. 7. Plan of rock-cut grave cemetery (FIG. 5).

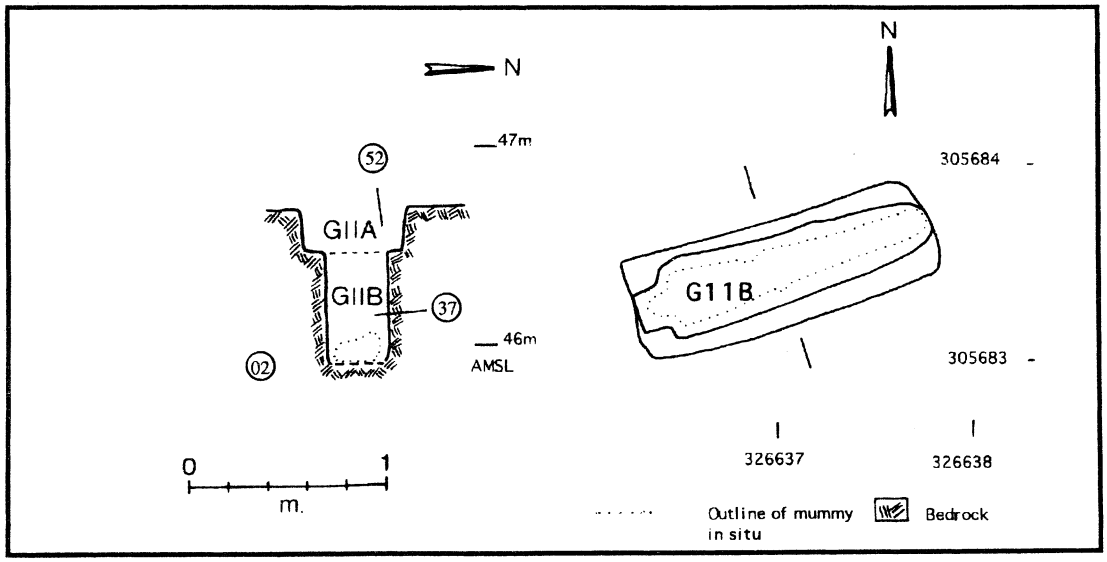


FIG. 8a. Cross-section and plan of G11A and G11B.

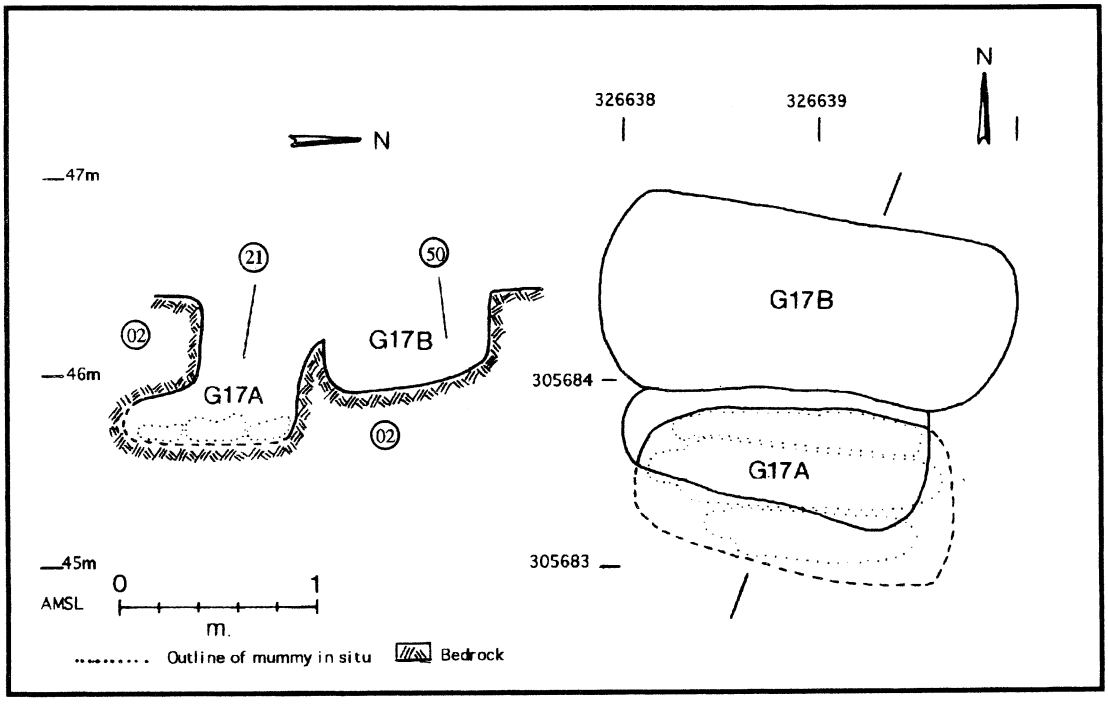


FIG. 8b. Cross-section and plan of G17A and G17B.

evidence of grave-robbing, with some burials disturbed and burning in the torso areas of a few mummies, presumably caused by robbers looking for amulets (G3, G14). However, associated grave objects are extremely rare in the majority of graves (see Table 1).

Of the burials themselves, three of the rock-cut graves (G3, G17A, and G18) and one of the surface sand graves (G20) were multiple, with the wrapped remains of up to three bodies in one interment. In two rock-cut graves were remains of children accompanying adults: G17A had one adult and two children, and G18 had one adult and one child. It is also possible that G17B contained one adult and one child, although this grave was much disturbed, with bones and pieces of two wooden coffins (one for an adult and one for a child) scattered on the grave floor. In G3 were mummies of three adults, though being rather small, they could have been adolescents. All were extended burials, with the bodies lying supine. The only exceptions occurred in cases of multiple occupancy where a child's mummy was tilted on its side to fit beside the body of the adult (G17A, the northernmost body (fig. 8b)). The ancient grave diggers provided extra space for a multiple occupancy interment by excavating horizontally in the bedrock, creating a recess in one of the sides of the grave. In G17A this recess added to the width of the grave, whereas in G3 it extended the grave lengthways (fig. 7). Usually the bodies had been wrapped with the arms lying at the sides, or with the hands resting over the pelvic region. In G18, however, it could be seen through the tight wrappings of the mummy that the adult had his/her right arm flexed so that the right hand was placed over the left shoulder. In G19 the adult had both arms flexed so that the hands rested one on top of the other over the chest area.

Evidence of wooden coffins was uncovered in two rock-cut graves, G17A and G17B, with, as noted above, the fragments in G17B including pieces from an infant's and an adult's coffin. Because of the very disturbed nature of this burial it is possible that the wood recovered from the uppermost sand layers in G17A may have originated from G17B, and may not be associated with G17A. The wood bears the remains of white gypsum plaster and faint bands of blue and yellow paint on one face. Three burials in the surface sand (G21, G24 and G30) had also been furnished with wooden coffins (or at least planks of wood to lay the body on), with no extant decoration. In G14 four tapering strands of corroded metal (probably copper or bronze), varying in length from 1.0–4.7 cm and 0.5 cm wide, were recovered from the torso area of the mummy. These could be rivets (although no wood was discovered in this grave) or some kind of personal adornment.

Having seen the paucity of grave goods, it was a surprise to encounter, resting on a ledge above the feet of the mummy in G11B, a beautifully carved limestone stela of Persian Period date (figs. 7, 8a; pl. VI, 2).[5] One surface bears inscriptions in both hieroglyphic and demotic, and has funerary scenes portraying iconography adapted to Persian as well as Egyptian tastes. The stela was found face downwards, and no other goods accompanied the burial. No comparable objects were found in any of the other graves excavated in this area. Presumably, therefore, this exceptional piece had been reused from its original location. The use of this stela possibly to mark the location of G11B may help to explain the presence of other slabs of limestone over the east ends

[5] For a detailed examination of this stela, see I. J. Mathieson et al., 'A Stela of the Persian Period from Saqqara', *JEA* 81 (1995), 23–41.

TABLE 1. *Burial data at North Wall of the Gisr el-Mudir*

Grave no.	*Context* S = sand B = bedrock M = mortar C = collapsed masonry	*Context no.*	*Grid sq.*	*No. of bodies* F = fragmentary/ disturbed U = unknown number	*Objects in grave* W = wood S = stela C = copper? strands	*Rock-cut graves* M = depth of mummy R = grave recess I = incomplete excavation		
						Length	*Width (max)*	*Depth*
1	S	003	B	F				
2	S	004	A/B	F				
3	B	005	B	3		1.30 + R	0.80	0.50 + M
4	S	006	A	F				
5	S	007	A/B	F				
6	S	008	A	F				
7	S	009	A/B	F				
8	S	010	C/D	F				
9	S	011	C	F				
10	S	012	C/D	F				
11A	B	014	C	F		1.40	0.52	0.22
11B	B	015	C	1	S	1.34	0.31	0.48
12	B	016	C	F		1.47	0.48	0.70
13	B	017	C	U		1.46	0.48	I
14	B	018	C	1	C	1.55	0.46	0.41 + M
15	B	019	C	U		I	0.39	I
16	B	020	C/D	U		I	0.60	I
17A	B	021	C/D	3	W	1.52	0.52 + R	0.72
17B	B	050	C/D	F	W	2.13	0.83	0.49
18	B	022	D	2		1.34	0.69	0.31 + M
19	B	023	D	1		1.60	0.38	0.89
20	S	025	M	3				
21	S	103	S	F	W			
22	S	104	T	1				
23	S	105	S	1				
24	S	029	M	1	W			
25	C	111	S-5	2				
26	C	114	S-5	F				
27	C	115	S-5	F				
28	S	119	S-15	F				
29	S	151	E	F				
30	S	152	E	F	W			
31	B	153	E	U		I	0.42	I
32	B	154	E	U		I	0.48	I
33	B	155	E	U		1.80	0.63	I
34	B	156	E	U		1.68	0.45	I
35	S	157	G	F				
36	S	158	G	1				
37	S	160	G	F				
38	B	163	G	U		I	0.30	I
39	B	033	D	U		I	0.50	I
40	B	034	D	U		I	0.54	I
41	B	035	D	U		I	0.55	I
42	M	172	H	U				
43	S	173	H	F				

of G15 and G38 (fig. 7) and G3. These slabs are up to 30 cm long and 5–9 cm thick and are undressed and unevenly shaped. These may have been used as grave markers or the scattered remnants of a protective layer covering the grave aperture. In G34 five flat stones (29-60 cm long, 16–25 cm wide and 6 cm thick) were positioned over the burial at the level of the bedrock, sealing the sandy infill of the grave.

From the small sample of graves excavated it is difficult to ascertain a chronology of the burials through their spatial distribution. However, two surface sand burials partly overlay, and therefore clearly post-dated, the rock-cut ones beneath them (G10 over G17B; G30 over G33) (fig. 7). In addition, the grave diggers of G17A had cut into the south side of G17B, indicating an interment post-dating G17B (fig. 8b). Of the graves sampled, six were rectangular and three were anthropoid in shape (fig. 7). Most were cut vertically into the bedrock. In G3, G11B and G12 further cutting to the grave sides had resulted in the forming of ledges (fig. 8a). In the case of G11A/G11B the rectangular shape in the upper portion of the grave (G11A) was thus transformed from anthropoid in its lowest part, where the mummy earlier rested (G11B).

An additional seven surface burials were located in the area to the north of the North Wall (fig. 5). Three lay just a few centimetres below the sand surface (G21, G22, G23), while a further three were uncovered when clearing away the collapsed masonry on top of the revetment infill (G25, G26, G27). One (G28) was located in grid reference N305719, E326616, in the hollow where stone had been robbed from the main North Wall, indicating that the burial was later than the stone-robbing activities. From the similarity of burial technique, it seems probable that these northern graves were part of the same cemetery as those to the south of the main wall, and occupants were interred at some point after a period of wall destruction. The burials consisted mostly of fragmentary mummies, simply-wrapped and with no associated grave goods. All were single interments, except for G25, where parts of two mummies were laid side by side. Accompanying G21 were fragments of undecorated wood, suggesting the use of a coffin.

Gisr el-Mudir: work carried out in 1995 (Ana Tavares and Elizabeth Bettles)

The West Wall

During the 1995 season we aimed at tracing the full extent of the West Wall. The positions of the outer and inner faces of the north-west corner of the enclosure have been located at the intersection of the excavations made by Abdel Salam Hussein in 1947–48 which had exposed the base course of the outer corner and several courses of the inner corner. The upper remaining courses of the east and west faces of the West Wall of the Gisr el-Mudir are indicated by several exposures visible on the surface. The wall is denuded, with its preserved upper courses varying from 50.89 m amsl. as exposed in sondage A8 (1993) to 50.64 m amsl. in areas exposed by Hussein (fig. 2). Twelve masonry courses were excavated in sondage A8, revealing the base course to be at 45.0 m amsl. (see sondage A8WW pp. 21–4 above; fig. 4). The south-west corner, however, was not apparent on the surface and had not been investigated archaeologically. Given the depth of sand to be removed, it was felt that the best use of resources would be to concentrate on the inner face of the corner. Sondages were therefore extended south from A8 along

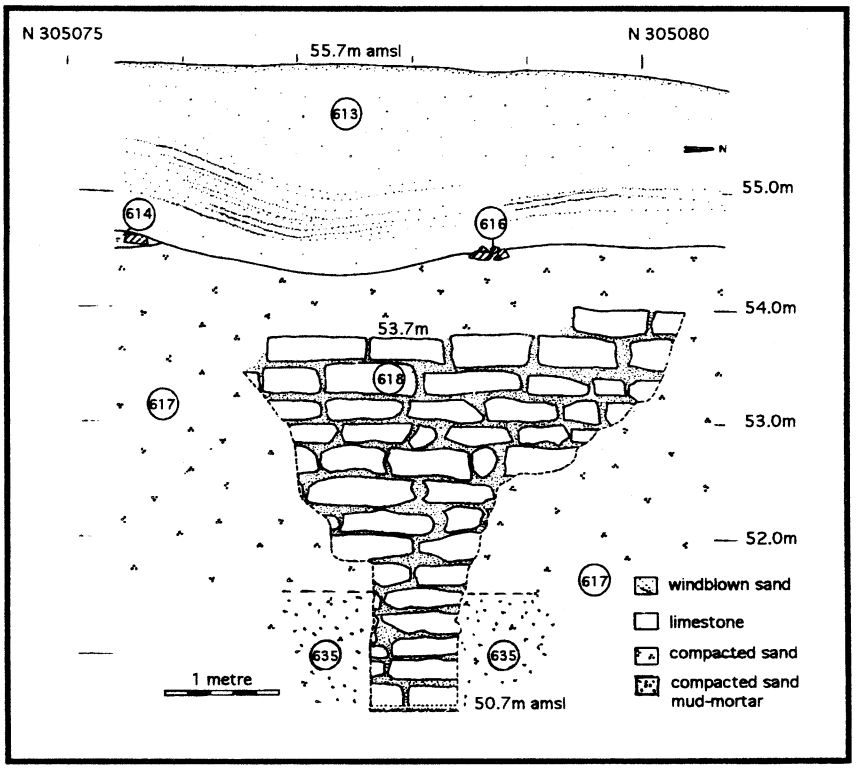


FIG. 9a. Sondage A12 exposed east face of West Wall.

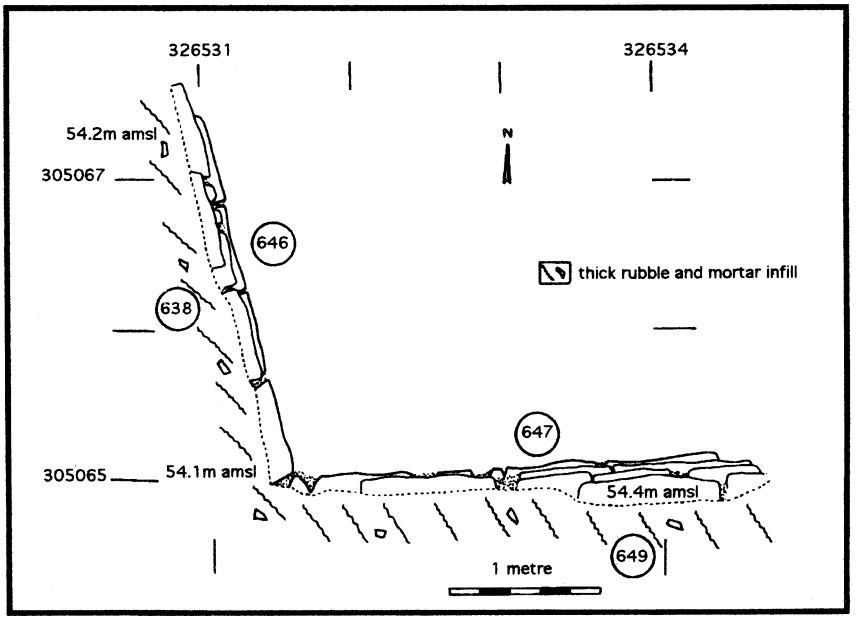


FIG. 9b. Sondage A12B plan of south-west corner.

the inner face of the wall. We had previously questioned the existence of this corner based on the data from sub-surface sensing investigation, and it is now clear that the depth of sand cover had obscured our results.

Fig. 2 shows the positions of A9, A10, A11, A12 to A13 and A14. Sondages A9–A12 revealed the inner face of the West Wall with the upper courses being overlaid by sand deposits varying from 0.5 m to 2.5 m in depth. The wall construction consists of a facing of local limestone masonry and an inner rubble fill which has been truncated due to robbing of the facing blocks. In the case of sondage A12, which coincides with resistivity cross-section GMXS1 (1991) and the sections covering anomaly A7 taken in 1993, an area of wall face, probably of locally quarried limestone blocks rather unevenly shaped and cemented together with abundant mud mortar incorporating limestone chippings, was exposed to a depth of fifteen courses (fig. 9a, pl. VII, 1). The face of the wall has a pronounced batter inward of 15 degrees, with what is probably the lowest course projecting 16 cm from the wall face. Abutting the bottom four courses is a compacted mixture of mud, sand and fine pebbles [635] which slopes downwards away from the wall face. This evidently functions as a support for the blocks at the base of the wall, as was observed against the bottom courses of the North Wall (fig. 6, contexts [30] and [109]) and in GMWW8 in fig. 4). At irregular intervals down the wall face, on unprepared stone surfaces, four mason's marks had been executed in red ochre. The making of the marks was probably contemporaneous with the wall's construction as a triangular lump of red ochre pigment was recovered from the mud mortar matrix [635] abutting the base of the wall.

The south-west corner of the Gisr el-Mudir

At a point about 15 m south of sondage A12 the uppermost courses of the south-west corner of the Gisr el-Mudir were uncovered. The corner construction was achieved by the abutting of limestone blocks of various sizes as a straight join. The substantial gaps which result from this method were filled with variously sized small limestone fragments and abundant mud mortar, with the excess mortar dripping down copiously. Bonded quoining, a feature noted in early pharaonic architecture, is absent (fig. 9b, pl. VII, 2).[6] The facing blocks at the corner were cleared of sand to a depth of five courses at the West Wall and eight courses at the South Wall. Exigencies of time precluded the clearing of the sand down to the desert surface. The blocks on the inner face of the South Wall reflect poor stone-wall construction techniques, with vertical alignment of blocks one on top of the other for a height of four courses (pl. VII, 2). This creates a vertical line of mortar which becomes a point of weakness in the wall. A similar instance can be seen on the wall face in A12, between the second and fifth courses from the base (fig. 9a). This provides a further indication of a poor awareness of sound construction techniques in stone by the builders of the 'Great Enclosure'. Where facing blocks at the south wall of the corner were robbed, this allowed the rubble wall infill to spill over the wall face and extend 7.5 m northwards into the enclosure area. This rubble, with its layers of conglomerate consisting of masses of coarse mud mortar, finer mud mortar and limestone

[6] See D. Arnold, *Building in Egypt* (New York and Oxford, 1991), 125–32.

fragments up to 30 cm long, had fallen onto the deep layer of aeolian sand accumulated against the wall. This collapse, and thus probably the associated robbing of the facing blocks, is provided with a *terminus post quem* by the discovery of a water jar which had lain on the sand and was probably broken as the rubble fell onto it. This jar has been dated to the end of the Old Kingdom/beginning of the First Intermediate Period (see fig. 16.2, and p. 43). Of particular significance, however, to the dating of the Gisr el-Mudir was the discovery of three whole beer jars within the fill (context [620], which consists of stratified layers of compact rubble with lumps of mortar, limestone fragments, desert flints and pebbles covered by layers of surface windblown sand). These jars have been provisionally dated to the end of the Second Dynasty/beginning of the Third Dynasty (see figs. 15.1 and 2, 16.1, and p. 46).

Two courses of corner core masonry were exposed in sondage A13, showing large articulated limestone blocks. The blocks measure approximately $0.75 \times 0.5 \times 0.3$ m and are laid in east–west rows with some mortar in the bedding joints and smaller limestone fragments in the rising joints (fig. 10b). Sondage A13 was extended to the south in an attempt to define the south face of the South Wall. A large expanse of robbed-out mortar fill and disarticulated core blocks was exposed at a depth of 53.9 m amsl., extending to the limit of the excavation some 21 m south of the inner face of the corner. In all the sondages it was seen that the wall structure is sealed by deposits of fine aeolian sand (fig. 10a, sondage A11) which have accumulated from the east and overlie both the masonry and the core fill; the latter has often been substantially removed. The absence of archaeological material in the deposits sealing the wall suggest that the dismantling and reuse of the wall masonry may have occurred soon after its construction and was probably followed by a long period of inactivity.

Three different techniques of construction are attested in the Gisr el-Mudir: a) hollow-construction for the perimeter of the enclosure wall, b) a masonry revetment against outer walls and c) solid masonry areas at the corners. The basic structure of the wall consists of a 'hollow-construction' of two rough masonry skin-walls with a rubble core. This technique in itself is not indicative of an early date although its execution seems to be.[7]

A masonry revetment built against the outer face of the outer walls is attested on the North Wall and probably exists on the West Wall where the width appears greater than normal. This consists of masonry blocks (average dimension $0.75 \times 0.60 \times 0.30$ m) extending to 6.25 m in width. The blocks are not dressed and therefore this is not a final revetment but still part of the core construction of the wall. The full extent and purpose of these revetments require further investigation.

The north-west and south-west corners of the enclosure wall are constructed of solid masonry. The north-west corner was exposed by Hussein and although the masonry is quite eroded, there is no corner bonding in the articulation of the blocks and no specifically cut corner stone. The blocks are larger than those used in the wall faces and a slight inclination of the masonry layers is detectable.[8]

[7] The 'hollow-construction' technique is attested throughout Egyptian history; see S. Clarke and R. Engelbach, *Ancient Egyptian Construction and Architecture* (reprint New York, 1990), 113.

[8] This is well attested in the Djoser complex and quite pronounced on the corner stones of the facing masonry; see J.-P. Lauer, *Histoire monumentale des pyramides d'Egypte*, I (BdE 39; Cairo, 1962), 248, 254 and figs. 72–3.

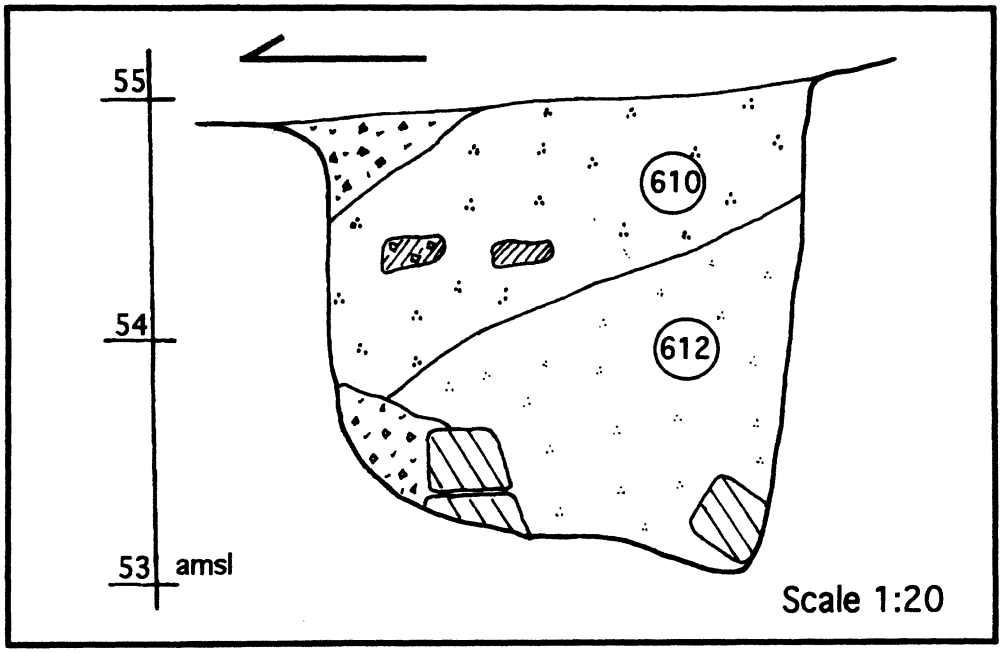


FIG. 10a. Sondage A11 sealing deposits on inner face of West Wall.

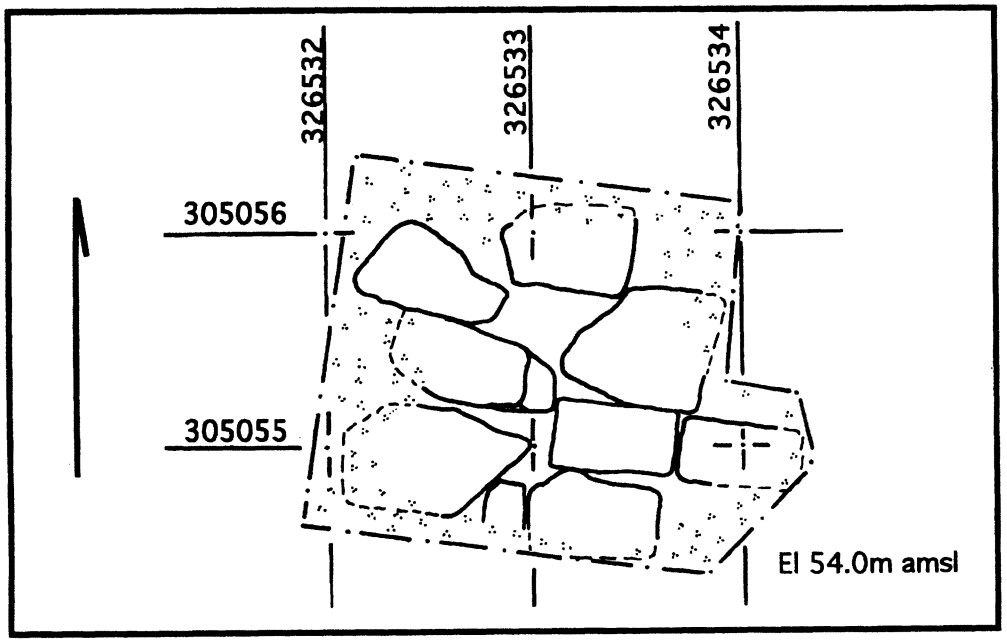


FIG. 10b. Articulation of the core masonry.

Ceramics of the Gisr el-Mudir 1993-1995 (Joanne Clarke and Louise Maguire)

In 1993 a surface collection of pottery at the Gisr el-Mudir was undertaken in conjunction with the excavation of a number of sondages in the south-west area inside the wall, where resistivity survey showed a series of anomalies. Sondages A7a (1–3), A7b, A7c and A7d produced very little pottery but the diagnostic sherds were identified by J. Bourriau as Archaic.[9] A 25 m square in the south-east corner of each 100 m grid area across the site was sampled (fig. 11). Analysis of this material (982 sherds) showed three components: Coptic sherds, imported wares of the sixth to fourth century BC and sherds of Archaic/Old Kingdom wares of the Second and Third Dynasties, as well as a large proportion of unidentified material (39 per cent). The sherdage was often abraded, baked and discoloured from surface exposure and was therefore unidentifiable. The Coptic wares are ubiquitous in Saqqara surface collections; the sixth to fourth century material may derive from plundered graves within the enclosure.

Eighteen per cent of the total were identifiable as Archaic/Old Kingdom. The major proportion of Archaic/Old Kingdom sherds (79 per cent) was collected from the area around the East Wall, along the fourth transect, running north to south (figs. 11 and 12). Archaic/Old Kingdom sherds were also collected from the second and third transects running north to south through the middle of the enclosure (14 per cent) and from the naught and first transects, i.e. the area around the West Wall (7 per cent). This pattern shows a decrease in the proportion of Archaic/Old Kingdom surface sherdage from east to west, the greatest proportion being in the region of the East Wall and virtually none near the West Wall. In comparison, only 25 per cent of the total sherd sample came from the region of the East Wall, suggesting that the distribution of Archaic/Old Kingdom sherds is not conditioned by the overall distribution of pottery. The Archaic/Old Kingdom material collected in the survey is of the same character as the few sherds found within the test trenches. The distribution of pottery from the later periods was most likely associated with the intrusive Late Period burials within the Gisr el-Mudir enclosure.

In 1994 a sondage trench was opened in the area of an anomaly shown on profile GMNWXS2 and extended to the north face of the North Wall. The pottery excavated from GMNWXS2 can be separated into two groups which would seem to correlate with the contextual background. Archaic/Old Kingdom pottery, comprising in the main Nile B and C beer jars and storage jars (handmade, finger and stick moulded) and Marl A1, Marls C or C1 closed vessels (handmade, coil and wet smoothed, and sometimes slipped) is consistently found in contexts associated with the Gisr el-Mudir north enclosure walls. In particular, context [030], sealed by [053], revealed fragments of an Archaic/Old Kingdom jar at the base of the south face of the North Wall (E326638, N305708, fig. 5). The Archaic/Old Kingdom material from the North Wall bears close resemblance to the material excavated in sondages GMA7c and A8WW in 1993.

The Late Period pottery (figs. 13.1 and 2, 14.1 and 2) (of which the majority of sherds are imports from the Aegean or Levant and local Nile C storage jars, with some marl imports from Upper Egypt) is found predominantly in the areas south of the northern

[9]The authors wish to thank J. Bourriau for her help with the identification of much of the pottery from the Gisr el-Mudir and in dating the vessels recovered from the excavation of the wall.

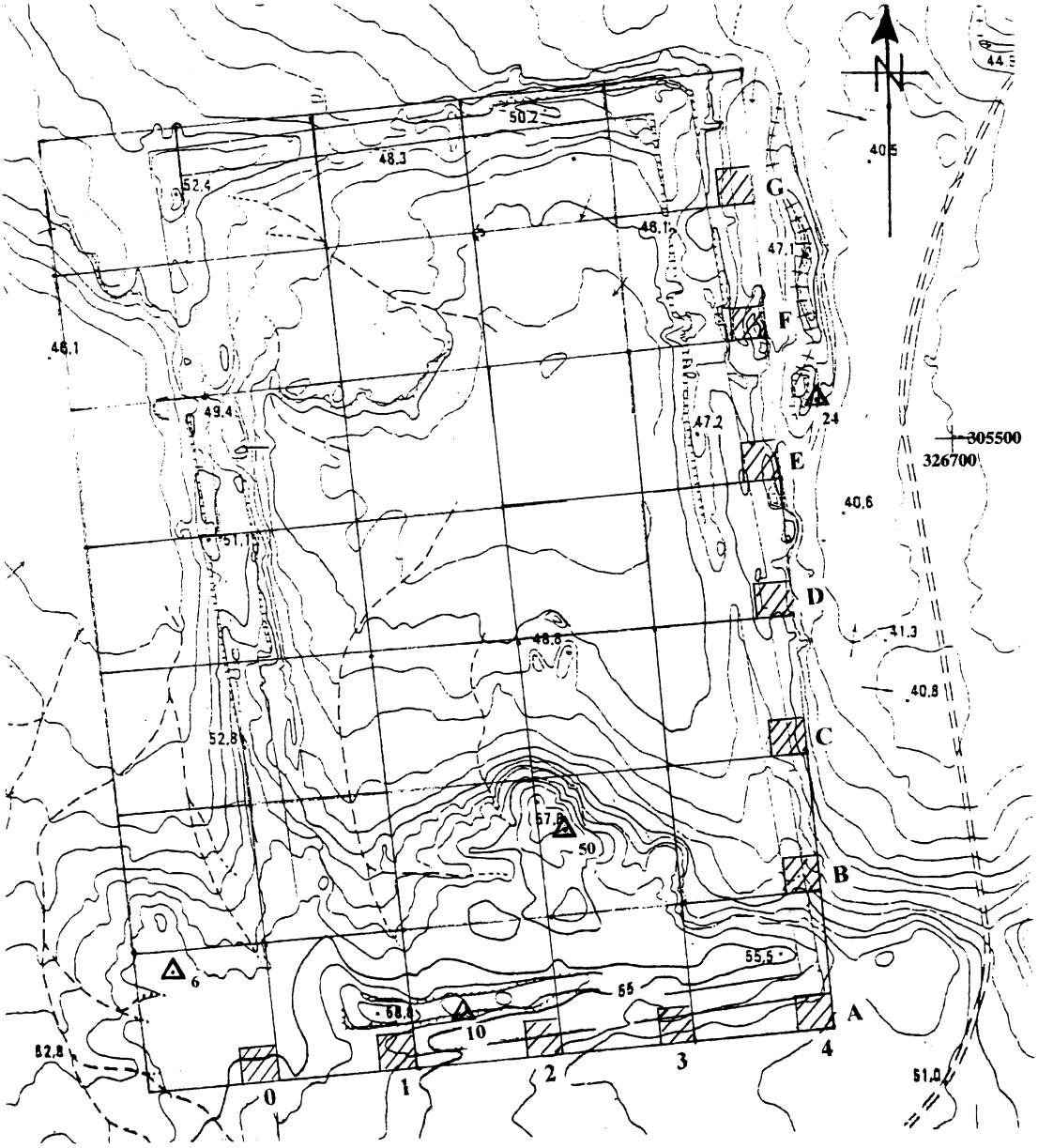


FIG. 11. Gisr el-Mudir ceramic surface survey grid 1993. UMT grid scale 1:3500.

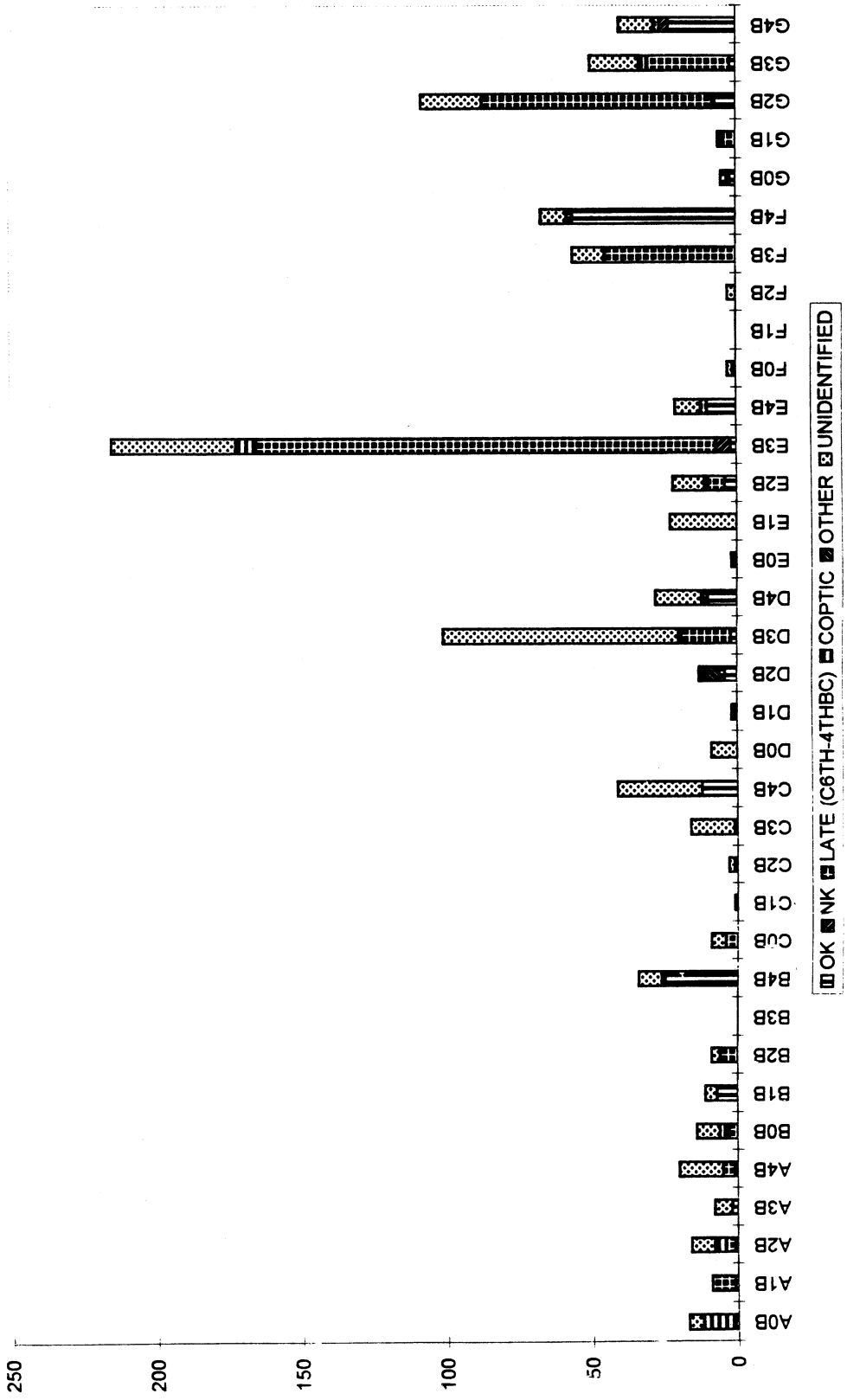


FIG. 12. Gisr el-Mudir ceramic surface survey graph 1993.

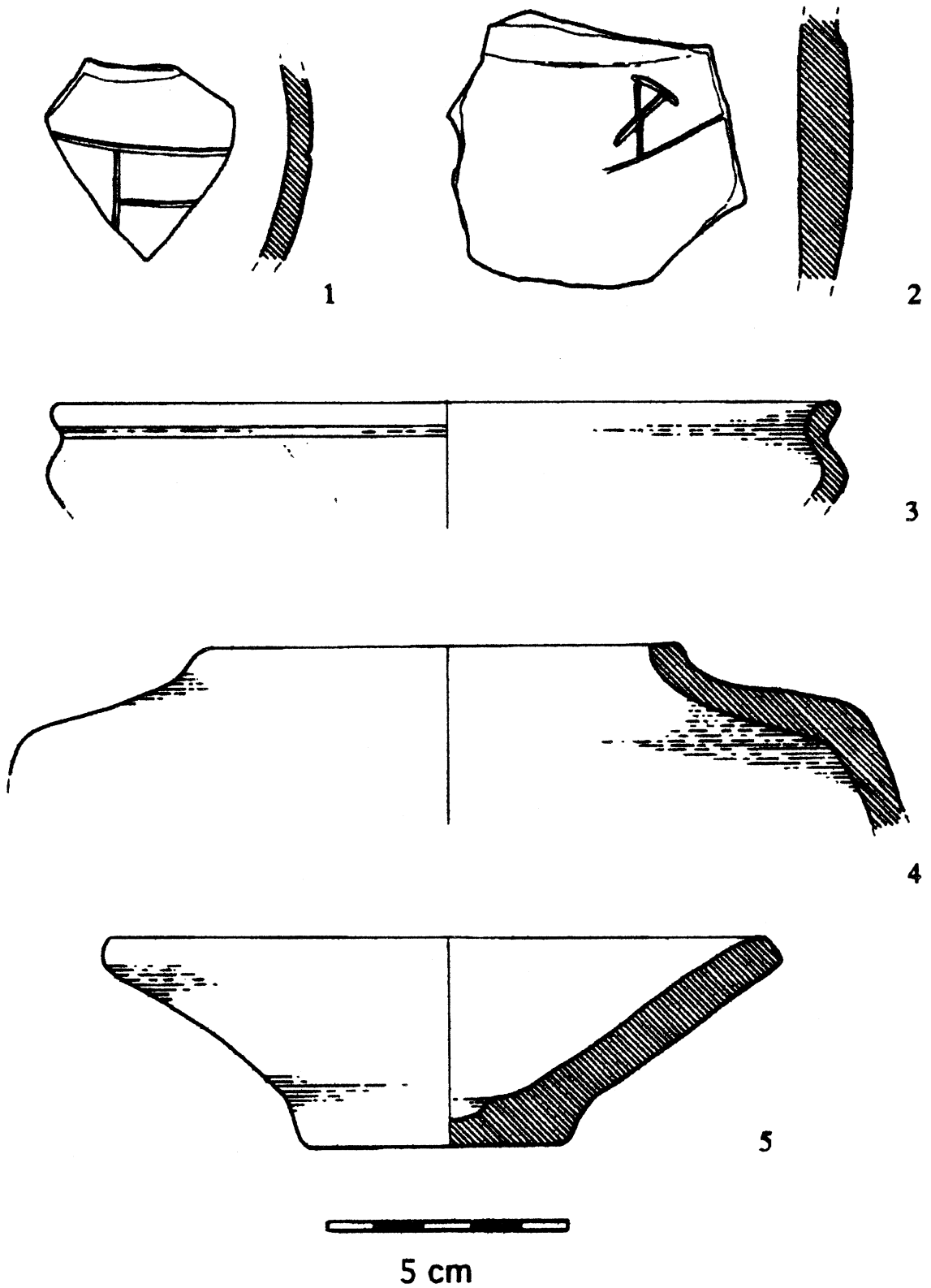


FIG. 13. 1. Gisr el-Mudir West Wall excavations 1995 2.–5. Surface pottery survey 1993.

enclosure wall, where a collection of rock-cut graves was excavated, and in the surface sand layers across the site. Both in the surface sand level of context [001] and above the rock-cut graves in context [002], where 'surface burials' and disturbed graves were recorded, and in and around the rock-cut graves hewn into context [031], many large sherds from amphorae probably imported from the East Mediterranean or the Aegean were noted (fig. 13.4). In area E326635, N305695 context [150] late amphorae fragments were mixed with Archaic/Old Kingdom jar fragments.

The excavation of the south-west corner of the Gisr el-Mudir in 1995 produced greater quantities of diagnostic pottery than had been found in the previous seasons of survey and excavation. A total of 378 sherds was recovered: 315 sherds and 4 whole vessels from the surface and sub-surface deposits in and around the corner of the wall (Table 2). Eighty-four per cent of the pottery assemblage was identified as Old Kingdom Nile C beer or water jars, identical to that found in context [030] on the North Wall in 1994

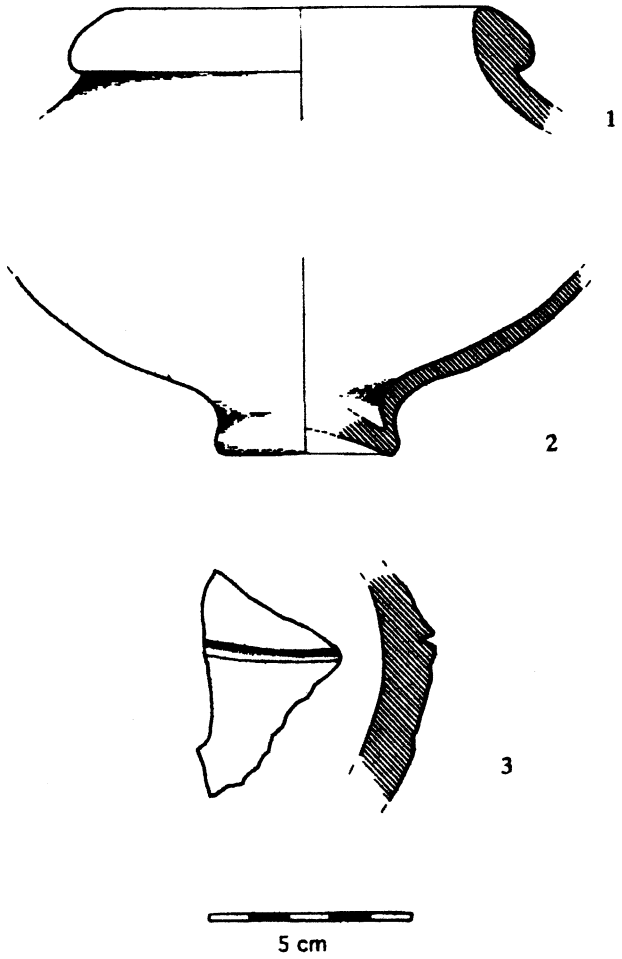


FIG. 14. Gisr el-Mudir surface pottery survey 1993.

TABLE 2. *Pottery from the south-west corner of the Gisr el-Mudir 1995*

	Surface	*Sand below surface*	*Rubble collapse*
Nile C beer jars	8 (38%)	13 (92%)	243 (90%)
Other Old Kingdom sherds	2 (10%)		15 (4%)
Late Dynastic and Coptic	3 (14%)		4 (1%)
Unidentified abraded sherds	8 (38%)	1 (8%)	18 (5%)

(p. 28). The beer jars were of a standard, coarse, hand-made variety which was common from the Second Dynasty to the end of the Old Kingdom. The other 16 per cent of the assemblage consisted of abraded body sherds of Old Kingdom date (5 per cent), some recognisable as Meydum bowl sherds, probably dating to the Fifth to Sixth Dynasties, Marl A and C and Nile B body sherds dating to the Ptolemaic and Coptic Periods (2 per cent) and unidentified abraded sherds (9 per cent).

The majority of the beer jars were identical in shape, with a short, slightly thickened rim bent vertically upwards from an elongated, gently curving, ovoid body with the greatest girth around the shoulder of the vessel, and a pointed base. The body was handmade and the rim slow-turned on a 'wheel', and then added separately, often displaying pronounced rill marks on the inner and outer surface extending down the vessel as far as the shoulder. In addition, the surface of the beer jars often had distinct finger ridges running vertically from the shoulder to midway down the body. Without exception the vessels were poorly fired, with black to grey cores and un-oxidized areas on the surface. The surface was left unsmoothed and large pit marks, typical of Nile C clay, could easily be seen where chaff and seeds had been burnt out in the firing process.

Deposit A13 [620], the degrading rubble and mortar lying directly above the south-west corner of the wall, produced 208 sherds and 2 whole beer jars (fig. 15.2, Obj. No. 95-6; fig. 16.1, pl. VIII, 1, Obj. No. 95-2). 193 sherds were from Old Kingdom beer jars, 11 sherds belonged to a red slipped vessel of a type similar to the large water jar found near the wall (fig. 16.2, pl. VIII, 2, Obj. No. 95-16), and 4 Marl A abraded and unidentified body sherds were of later date. Just north of A13 [620] a third beer jar was discovered *in situ* within the rubble fill of the wall (fig. 15.1, Obj. No. 95-14), giving a *terminus ante quem* for the construction of the wall. These beer jars are of the standard type found at the Gisr el-Mudir, with slightly thickened rim, elongated ovoid body terminating in a pointed base and finger ridges. A fourth vessel was recovered from underneath the wall collapse (A12C [650]). It was a large, red slipped and highly burnished, wheel-made jar with a wide ovoid body and flaring neck ending in an out-turned, slightly rolled rim (fig. 16.2, Obj. No. 95-16). The base of the jar was handmade and added separately to the body of the vessel. This technique is characteristic of the late Old Kingdom and First Intermediate Period to which this vessel most likely dates.

The handmade form of beer jar has a prolonged life, appearing in its common form in the late Second Dynasty and surviving with little development to the end of the Old

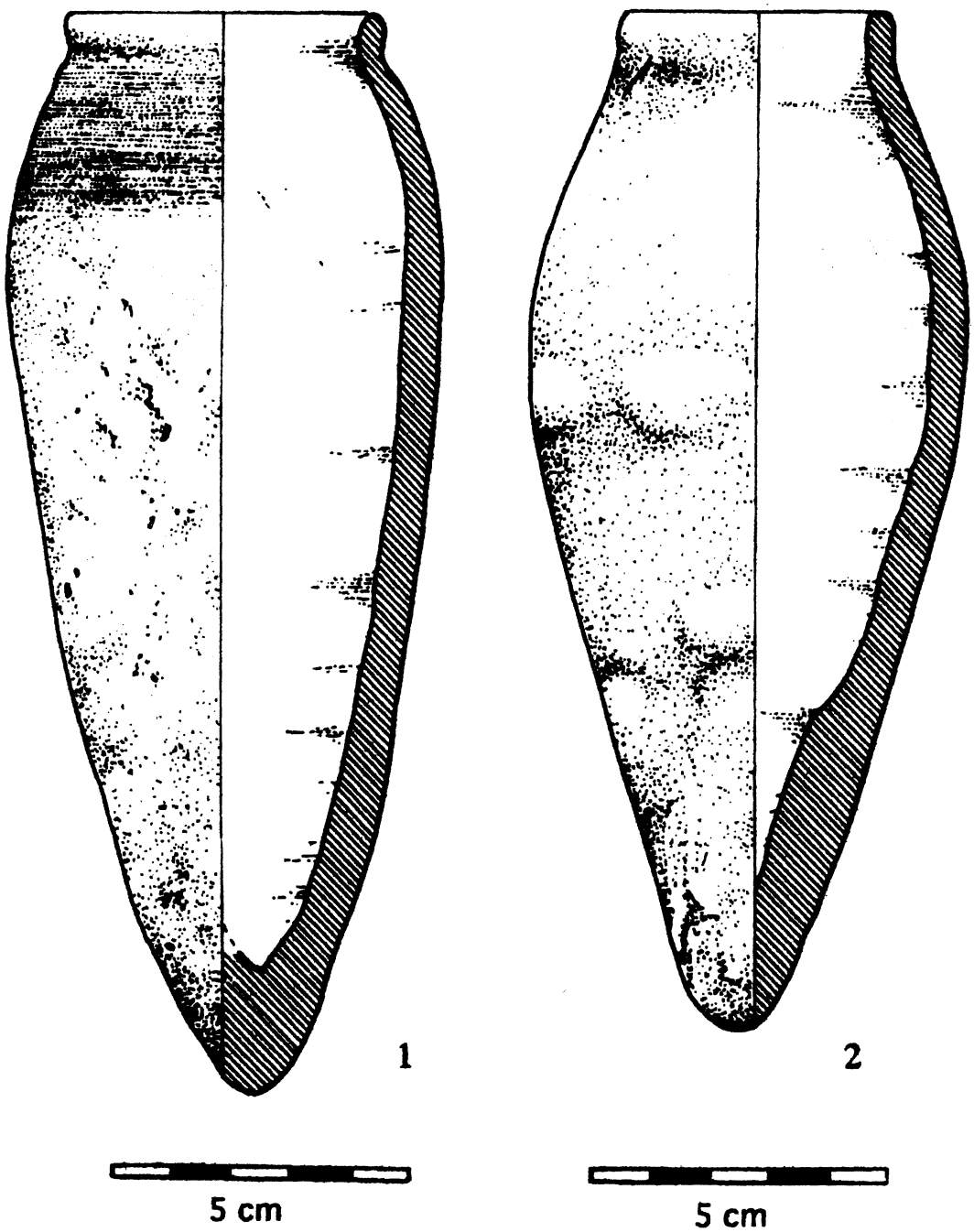


FIG. 15. Beer jars: 1. Obj. No. 95-14 and 2. Obj. No. 95-06.

Kingdom. This type of jar is known throughout Egypt and although traditionally assumed to vary little, both spatially and temporally, it is now known that the earlier forms are usually ovoid in shape and are characterized by a short neck and simple or rolled rim which is bent upwards vertically from the shoulder of the vessel.[10] The combination of

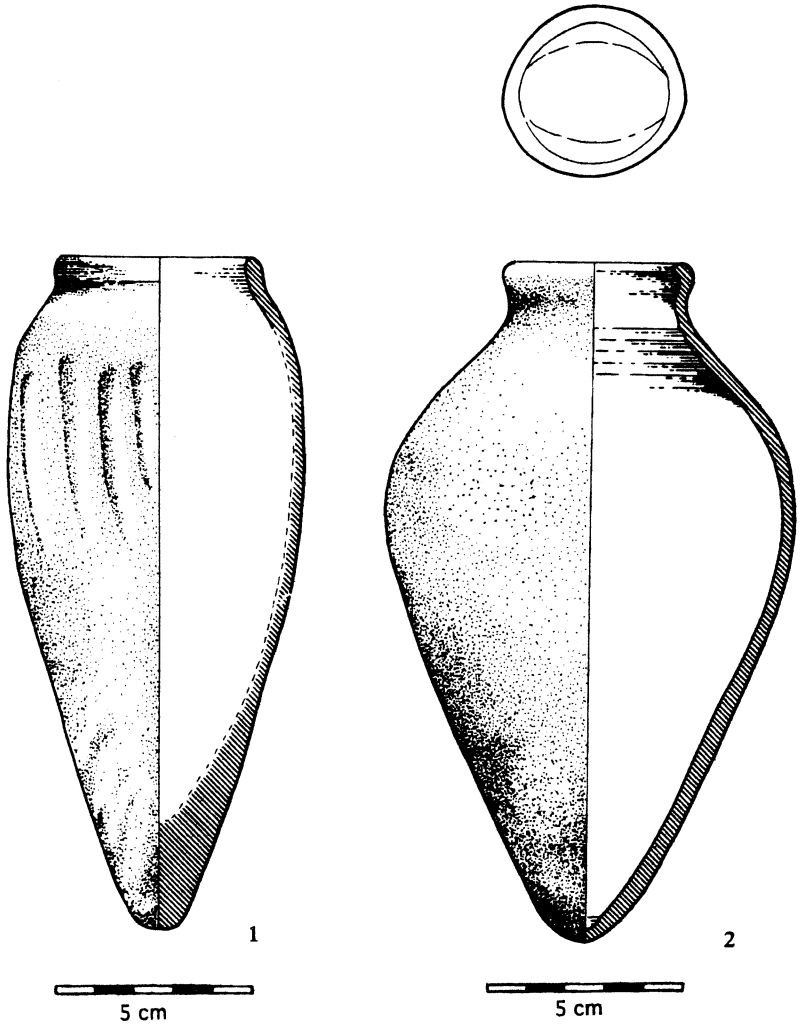


FIG. 16. 1. Beer jar Obj. No. 95-02 and 2. Water jar Obj. No. 95-16.

[10] D. Faltings, *Die archäologische belegten Biertopfe* (unpublished Ph.D. thesis, in preparation).

poorly dated contextual evidence and impeded development of form makes it difficult to date the Gisr el-Mudir beer jars with any real accuracy. The ovoid body form would place the type earlier than the Fifth Dynasty, when forms became more cylindrical; however, the general rim and body shape is similar to beer jars from Abydos dating from the Second to the Fourth Dynasty.[11] The morphology of the vessels found at the Gisr el-Mudir is extremely homogenous and there are no examples of the triangular rim known throughout Egypt in the Third and Fourth Dynasties. This may be due purely to the nature of deposition, or it may be a result of a regional variation. Certainly, the beer jars from the Gisr el-Mudir fit well with examples from the late Second and early Third Dynasties.[12] Although a date this early cannot be confirmed absolutely, the presence of large quantities of early Old Kingdom beer jars in the deposits directly associated with the wall supports the hypothesis that the wall was constructed early in the Old Kingdom and probably not later than the Fourth Dynasty.

Many of the beer jar sherds and two of the whole vessels contained a black, silt-like substance which lined the inside of the vessel. Traces of this or a similar substance could also be recognized on the outer surface of the vessel, around the rim and shoulder. The way in which the substance was deposited within the vessels suggests the residue does not originate from the vessels' contents. The fact that the material lined the inside of the vessel and was not deposited in the base (if the jar was stored upright), or on one side of the vessel (if the jar was stored in a horizontal position) suggests that the substance may be the remains of a sealant. Many examples of this type of beer jar were sealed with a mud stopper, and the outer surface deposit may be all that remains of this. The residue on the inside of the vessels may suggest that the vessels were lined with a silty substance before use, to ensure they were watertight or for some other, as yet unknown, reason. It cannot be assumed outright that the vessels were watertight. It is hoped that analysis of the residue can be undertaken in the future.

Gisr el-Mudir human skeletal material 1994–1995 (Corinne Duhig)

Fifteen bags of disarticulated but relatively undamaged human bone were examined, which derived from twelve burial *loci* ('graves') and produced a minimum number of 24 individuals, as shown in Table 3. Only in the case of individuals 17B.A and 21 could more than two or three bones be re-articulated, so it is possible that a still greater number of individuals is represented. Most bones were mid- to dark brown in colour, with adherent bandages of coarse tabby cloth and lumps of a black resinous material, but four were white (bleached) and it is assumed that they have been exposed on the surface.

[11] W. M. Flinders Petrie, *Abydos, Part II: 1903* (EEF 24; London, 1903), pl. xliii, no. 200; T. E. Peet and W. L. S. Loat, *The Cemeteries of Abydos, Part III, 1912–1913* (EEF 35; London, 1913), pl. iv, nos. 35–36.

[12] See n. 10 for a complete summary of existing beer jars.

TABLE 3.

Grave no.	*Bone no.*	*Context no.*	*Individual*	*Sex*	*Age (yrs)*	*Pathological conditions*	*Condition*	*%*
3	1/5	5	A	F	25–35	EDDs, caries, tooth abscess, o/a of rib head	—	4
			B	N/A	3–4 ± 12 m	—	—	<1
			C	N/A	immature	—	bleached	2
9	2/3	11	A	M	adult	vault porosities	—	10
			B	N/A	12–17	—	—	7
			C	F	older adult	tooth abscess	—	6
			D	N/A	8.5–9.5	—	—	5
11A	6	14	—	N/D	adult	o/a of C and T vertebrae	—	5
12	7	16	A	M	adult	fractured clavicle, o/a of C vertebrae, tooth abscesses	—	17
			B	F	17–24	—	very gracile, bleached	3
13	8	17	—	N/D	adult	—	—	1
14	9/10	18	A	F	25–35	o/a of C and T vertebrae	—	7
			B	N/A	1.5–2.5	—	—	16
16	4	20	—	N/D	adult	—	vault fragment only	<1
17B	14	21	A	N/A	3.5±12 m	hip disorder	—	35
			B	N/A	9±24 m	—	—	5
			C	N/D	adult	—	bleached	<1
20	11	25	A	N/D	adult	Schmorl's nodes on T vertebrae, squatting facets	—	3
			B	N/A	child	—	mt only	<1
21	12	103	—	N/D	adult	new bone on mt4 plantar shaft	—	1
23	13	100	—	N/D	adult	—	tibia only	2
29	17	151	A	N/D	adult	stature 170 cm if M, 167 cm if F	—	5
			B	N/A	child	—	mt only	<1
			C	N/A	immature	—	tibia only, bleached	3

Methods

General methods of skeletal recording and analysis are those contained in Stewart,[13] Steele and Bramblett[14] and Ubelaker.[15] Specifically, sexing uses Phenice[16] for the pelvis and Ubelaker[17] for this and other areas of the skeleton. For ageing of immature individuals I have used the dental development and eruption standards of Moorrees, Fanning and Hunt[18] and Ubelaker[19] and the diaphysis-length tables of Ubelaker.[20] The age of a subadult is given to the year with the range of variation (for example, 3.5 years±12 months) or as 'child' (one year to puberty) or just 'immature' (up to skeletal adulthood at approximately 18 years). Ageing of adults uses the Suchey–Brooks pubic symphysis casts[21] and Brothwell's[22] classification of dental wear, the latter adjusted down by one band to make a coarse correction for the exceptional degree of attrition found in ancient Egyptian dentitions.

Stature and body form

Only one adult long bone was sufficiently preserved to be measured,[23] the right femur of 29.A. The sex of this individual could not be determined, but the height, determined by the regression equations of Trotter,[24] would have been 170±3.27 cm if male and 167±3.72 cm if female; these heights are within the usual ranges for archaeological skeletal material. The adult bones are all fairly

Pathological conditions

Osteoarthritis

The most common pathological changes are in the spinal column. Three of the fourteen adult spines (21 per cent) had eburnation (polishing due to bone-to-bone contact), joint margin osteophytes and joint-surface pitting, a combination of which indicates osteo-

[13] T. D. Stewart, *Essentials of Forensic Anthropology* (Springfield, Ill., 1979).

[14] D. G. Steele and C. A. Bramblett, *The Anatomy and Biology of the Human Skeleton* (College Station, Texas, 1988).

[15] D. H. Ubelaker, *Human Skeletal Remains: Excavation, Analysis, Interpretation* (Manuals on Archaeology 2; Washington, D.C., 1989).

[16] T. W. Phenice, 'A Newly Developed Visual Method of Sexing the Os pubis', *American Journal of Physical Anthropology* 30/2 (1969), 297–301.

[17] *Human Skeletal Remains.*

[18] C. F. A. Moorrees, E. A. Fanning and E. E. Hunt, 'Formation and Resorption of Three Deciduous Teeth in Children', *American Journal of Physical Anthropology* 21 (1963), 205–13, and 'Age Variation of Formation Stages for Ten Permanent Teeth', *Journal of Dental Research* 42/6 (1963), 1490–502.

[19] *Human Skeletal Remains.*

[20] Ibid.

[21] S. Brooks and J. M. Suchey, 'Skeletal Age Determination Based on the Os pubis: A Comparison of the Acsádi-Nemeskéri and Suchey-Brooks Methods', *Human Evolution* 5 (1990), 227–38.

[22] D. R. Brothwell, *Digging Up Bones: 6*,[2] (London, 1972).

[23] Method in W. M. Bass, *Human Osteology. A Laboratory and Field Manual* (Missouri Archaeological Society Special Publication 2; Columbia, Miss., 1987).

[24] M. Trotter, 'Estimation of Stature from Intact Limb Bones', in T. D. Stewart (ed.), *Personal Identification in Mass Disasters* (Washington, D.C., 1970), 71–83.

arthritis.[25] This conforms to the pattern in most archaeological samples.[26] Two of the three cases include cervical vertebrae, however, which are usually less affected than the lower vertebrae: many strenuous activities can produce damage in this area, including carrying heavy loads on the head. Schmorl's nodes were present in one lumbar spine: they are indentations in the vertebral body surfaces produced by pressure when the soft interior of an intervertebral disc herniates through its firmer outer ring. Schmorl's nodes are indicative of disc degeneration and are associated with weight-bearing stresses on the spine,[27] but are found in most people over 40 years of age.[28] Rib heads, which articulate with the spine, are also common sites of osteoarthritis change, as found in one specimen here.

Enamel developmental defects (EDDs)

Tooth-enamel formation can be disrupted by a number of physiological stressors, the most common being starvation and severe feverish illness.[29] The changes on the tooth surface are linear or, less commonly, spotted indentations in the enamel, and are referred to by various terms, of which 'enamel developmental defect' or 'dental enamel hypoplasia' are frequently used. Absolute rates vary considerably among populations, with a tendency to increase from hunter–gatherer stage to agricultural subsistence, even up to 80 per cent prevalence,[30] so the presence in one dentition here is unsurprising.

Dental caries and abscesses

Contrary to modern experience, dental caries was relatively infrequent in the ancient world because of lack of refined sugars in the diet, but severe wear by coarse foods exposed the tooth pulp, admitted infection and produced apical (root-tip) abscesses. Worn tooth crowns cause uneven stresses during chewing, so loosening the teeth and allowing infection into the supporting soft tissues, leading to gingival (gum-margin) abscesses. Tooth loss in archaeological populations usually indicates this type of dental history. Only one small carious lesion was found, but three individuals in this group had abscesses: one, 12.A, had the supporting bone of at least five adjacent teeth affected and more than 50 per cent tooth loss during life, and probably suffered considerably from the pain and debility of infection.

Vault porosities

The small porosities on the upper occipital and posterior parietal bones—the posterior portion of the skull vault—of 9.A might represent the condition *porotic hyperostosis*, indicative of iron-deficiency anaemia, although definite diagnoses are usually impossible

[25] J. Rogers et al., 'Arthropathies in Palaeopathology: The Basis of Classification According to Most Probable Cause', *Journal of Archaeological Science* 14 (1987), 179–93.

[26] D. J. Ortner and W. G. J. Putschar, *Identification of Pathological Conditions in Human Skeletal Remains* (Smithsonian Contributions to Anthropology 28; Washington, D.C., 1985), 430.

[27] D. Resnick and G. Niwayama, *Diagnosis of Bone and Joint Disorders* (Philadelphia, 1988), 1527–8.

[28] Ortner and Putschar, *Identification of Pathological Conditions*, 421.

[29] J. S. Pindborg, *Pathology of the Dental Hard Tissues* (Copenhagen, 1970), 117.

[30] J. R. Lukacs, 'Dental Paleopathology: Methods for Reconstructing Dietary Patterns', in M. Y. Iscan and K. A. R. Kennedy (eds), *Reconstruction of Life from the Skeleton*[2] (New York, 1994), 281.

even with X-ray. Iron-deficiency anaemia is the commonest anaemia in the modern world and the most significant trace-element deficiency.[31] The main cause is not inadequate diet but malabsorption of dietary iron and bleeding due to internal parasites.[32] Treatments for two types of intestinal worm, *pnd* and *ḥfȝt*, are given in Papyrus Ebers,[33] but the main endoparasite in Egypt today, infecting nearly half the population, is the bilharzia flatworm, *Schistosoma haematobium*, which causes bleeding from the bladder. It was probably equally common in the past; a prescription against haematuria is given in Papyrus Ebers 49.[34] *Schistosoma* eggs have been found in mummies and the schistosome antigen[35] has been detected in Predynastic and Late Period mummies.

Fractured clavicle

Individual 12.A had fractured the lateral end of his collarbone. Even today, a broken collarbone is often left untreated and usually heals satisfactorily, but in this case there is considerable deformity, the lateral end forming a right angle with the shaft, and new bone has grown into a tendon insertion, suggesting that strenuous activity was continued during the healing period. The Edwin Smith Papyrus recommends splinting,[36] and such immobilizing treatment might have been to the benefit of this patient.

Squatting facets

Squatting facets, present in 20.A, are small flattened areas on the distal articulation of the tibia and the corresponding area of the talus, thought to be produced by extreme dorsiflexion of the foot in habitual squatting. Kennedy[37] shows, however, that although a habitual squatting posture does appear to be implicated in producing these facets, most of the literature presently available is no later than the 1930s and the aetiology is still poorly understood.

Metatarsal new bone

Individual 21 has some coarse new bone with a possible cloaca (hole for pus to escape) on one of the bones of the sole of the foot, which probably indicates a localized non-specific infection. Such infections are extremely common where people go barefoot or wear light open footwear.

[31] T. Waldron, 'The Effects of Urbanisation on Human Health: The Evidence from Human Remains', in D. Serjeantson and T. Waldron (eds), *Diet and Crafts in Towns. The Evidence of Animal Remains from the Roman to the Post-Medieval Periods* (BAR British Series 199; Oxford, 1989), 58.

[32] P. Stuart-Macadam, 'Nutritional Deficiency Diseases: A Survey of Scurvy, Rickets, and Iron-Deficiency Anemia', in Iscan and Kennedy (eds), *Reconstruction of Life from the Skeleton*[2], 212–13.

[33] H. von Deines and W. Westendorf, *Wörterbuch der medizinischen Texte* (Grundriss der Medizin der Alten Ägypter 7; Berlin, 1961–2), 267–8, 594–5.

[34] Ibid. 763.

[35] A. M. Deelder et al., 'Detection of Schistosome Antigen in Mummies', *Lancet* 335 (1990), 724–5.

[36] P. Salib, 'Trauma and Disease of the Post-Cranial Skeleton in Ancient Egypt', in D. R. Brothwell and A. T. Sandison (eds) *Diseases in Antiquity* (Springfield, Ill., 1967), 604.

[37] K. A. R. Kennedy, 'Skeletal Markers of Occupational Stress', in Iscan and Kennedy (eds), *Reconstruction of Life from the Skeleton*[2], 131, 146–51.

Hip disorder

The child 17B.A (pl. IX, 1), who was the best preserved of this assemblage, has a shallow acetabulum (hip socket) with anterior lipping and containing a small circular eroded area. It is tentatively suggested that this was a mild case of congenital dislocation of the hip, in which, unlike more severe cases, the femoral head was retained in the socket but was already beginning to produce osteoarthritic changes because of chronic slipping.[38]

Summary

In terms of stature, body form and types of pathological conditions present, the assemblage is quite unexceptional for ancient Egypt, and indeed, apart from the bone gracility, for much of the ancient world.

Gisr el-Mudir faunal remains 1994–1995 (Salima Ikram)

The total number of animal bones found from the 1994 and 1995 seasons consisted of one articulated skeleton of a *Bos taurus* in addition to 30 other miscellaneous bones, teeth, and fragments of both, coming mainly from the area of the West Wall, where the 1995 work was concentrated (Table 4).

There were only two faunal elements found during the 1994 season. One was a badly weathered right horn of a goat (*Caprahircus* [x52, B15]), and the other was a proximal humerus from a wild dog (*Canis familiaris* [x52, B16]) which was over one year old. Although the horn was too weathered to reveal any evidence of tooth marks, it is possible that it was brought to the find site by a carnivore of some sort, perhaps a fox or wild dog.

The most dramatic faunal find from the 1995 season was the intact and articulated skeleton of a young cow (*Bos taurus* A8WW [1007]). The animal was found buried under the stones from a tumbled portion of the West Wall. It is unclear whether the animal tripped and then had the wall topple onto it, or, more likely, died on the spot and the wall collapsed onto it later. The state of the majority of the bones did not suggest that the animal had died due to having a wall fall on it. The skull was quite damaged, but

TABLE 4. *Faunal remains from the Gisr el-Mudir 1994–95*

Animal	*Total number of bones*	*Minimum number of individuals*
Bos taurus	Entire Animal ~ horn	2
Sus scrofa	8	1
Canis familiaris	1	1
Caprahircus	1	1
Ovis/Capra	1	1
Medium mammal	8	irrelevant

[38] Ortner and Putschar, *Identification of Pathological Conditions*, 359–62.

this could have as easily been a result of the wall's falling on it after death as being the cause of death. The animal had fallen on its left side with its head thrown back toward the north and its legs facing south-east. A curious feature about the animal was the amount of what was probably meat that had survived. The meat and perhaps viscera (a dark powdery substance) were most noticeable below the fourth rib. The dark powder, which initially looked like silt, contained the empty shells of insect, perhaps maggot, larvae. It is strange that the meat was not eaten by scavengers such as the dogs and foxes which abound in the desert—perhaps this implies that the animal was sick and the other animals did not want to eat it and become ill themselves. Otherwise, even if part of the animal was trapped beneath the wall, it, or portions thereof, could have been dragged out and consumed by scavengers. However, the skeleton showed no signs of disturbance. Another curious feature is that although what is possibly meat was found, no skin or hide could be distinguished. Often, when animals, or humans, are found buried in the sand in Egypt, the skin/hide separates from the flesh and dries as an over-skin. 'Ginger' in the British Museum is one such Predynastic human example, while the offering foreleg found in the tomb of Wah in Thebes is one of several instances of skin and flesh both being preserved over animal bone. When this happens it is more common for the flesh to be lost, with the skin remaining intact. On the whole, the quality of bone preservation was quite high, although the bone was fairly brittle and portions of the skeleton crumbled shortly after excavation. The horn cores were especially friable and their tips crumbled during transport. The animal was very young; its distal humerus, one of the earliest limb bones to fuse, was in the course of fusing, so it was under a year and a half old. No other limb bones were fused. The pelvic bones were fairly well advanced in their fusion, so it is probable that the animal was over six to eight months old, but under a year and a half. Its horns were quite well developed. It is curious to find such a valuable meat animal alone and so far away from the cultivation.

The other spectacular bovid find of the 1995 season was a long curved horn of a *Bos taurus* (south-west corner A12B [645]) that was very similar in shape to that of the so-called lyre- or long-horned cattle depicted on tomb walls. It measured 42.5 cm in length and was found at the south-west corner of the enclosure. The horn could have belonged to a male or female, as both genders are horned (pl. IX, 2).

Other than *Bos* bones, pig bones were the most common faunal remains found in 1995. A mandible containing the erupting third molar, M2, M1 and a few assorted teeth of a pig (*Sus scrofa* [A 13 + 8 m, WW 628]), together with four head fragments were found a little way from the West Wall. The dentition suggests that the pig was over a year and a half old at death, approximately between 18 to 30 months. Portions of a left scapula and the fore and hind legs and feet of a pig were found at the West Wall itself. It is possible that all the pig bones found at A 13 were from one individual, but this is debatable.

Portions of a sheep or goat (*Ovis/Capra*) were also found in the West Wall. A portion of the distal head of the humerus (West Wall A12 [613]), was found. It had just fused, so the animal had to be over five months old. Two very weathered rib fragments were also found nearby (West Wall A12 [632]). In total, of all identifiable bones, the site yielded remains of two *Bos*, at least one, if not more, *Sus*, one *Canis*, one *Ovis/Capra*, and one *Capra* (Table 4).

Conclusions

For many years, the Gisr el-Mudir has been a sadly neglected site. Although clearly visible on early Royal Flying Corps aerial photographs from 1920, and even on de Morgan's maps of 1897,[39] and evident on the ground when visited, only Abdel Salam Hussein carried out an inspection and excavation of the structure in two seasons, 1947 and 1948. Unfortunately none of his notes were published and only a few photographs remain in the archives of the SCA in Saqqara. There have been many conflicting theories about the function of the monument: a fort to guard the Saqqara necropolis, a cattle enclosure, an abandoned pyramid or a funerary enclosure.

Our work, using geophysical prospection methods and sondage trenches to check the results, has been important in that it shows that the monument has massive walls 15–17 m thick, faced with local limestone (figs. 4 and 6) and it stands in places to a height of 15 courses or approximately 5 m (fig. 9a), with a total internal area of 246 hectares (400 m in width by 615 m in length) (fig. 2). Field inspection and geophysical results show no indication of major structures within the enclosure to suggest a pyramid complex similar to the Step Pyramid or a buried trench, such as that at Sekhemkhet's complex. The high mound at the southern central area appears to be man-made as is the east–west ridge lying to the inside of the South Wall.

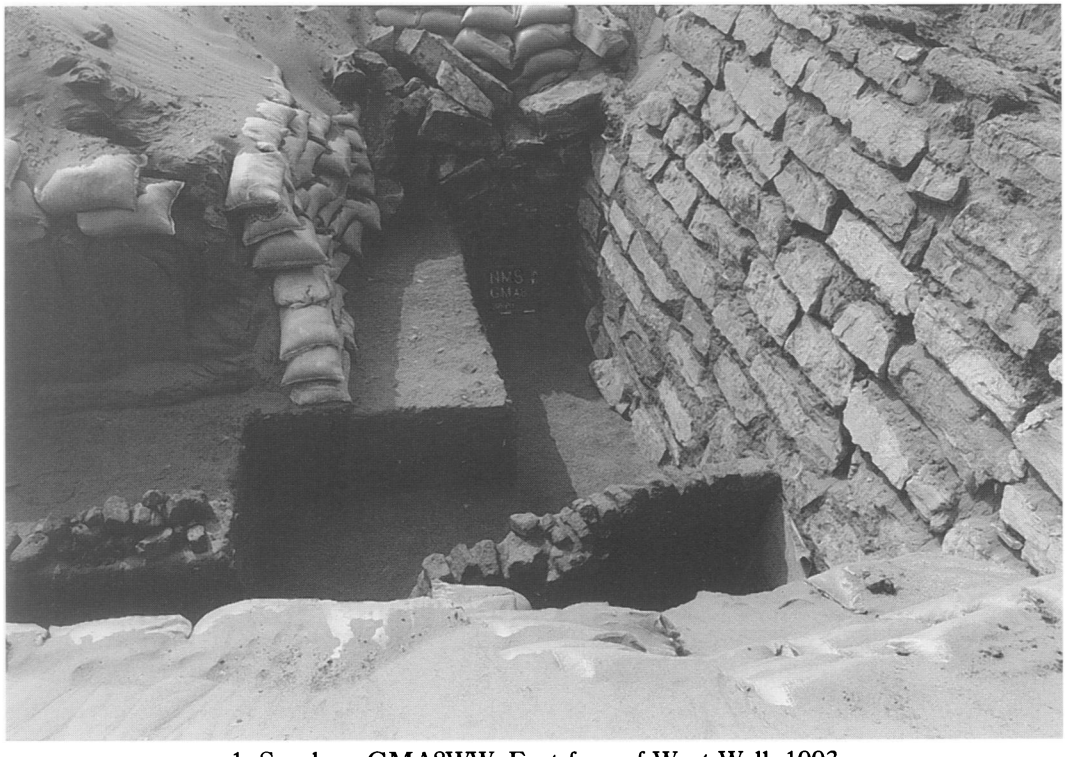
So far, our explorations lead us to believe that the South Wall is unfinished, as is the south-east corner, but these findings remain to be proved during future seasons. Robbing of the local limestone facing blocks has been carried out but there is no sign of attempted reuse or development such as at the complexes of Djoser and Sekhemkhet. It is, therefore, important for the NMS project to attempt to find an accurate date to place the Gisr el-Mudir in its correct historical context. We do not yet know whether we are looking at an unfinished pyramid structure or, by the indications of the pottery finds and the obviously inexperienced mason's work on the limestone facing blocks, at an attempt to construct a funerary monument in stone rather than one like the mud-brick examples at Abydos and Hierakonpolis. This attempt at construction in stone might have formed the inspiration or model for the complexes of Djoser and Sekhemkhet. As each season is completed we come to the conclusion that the answer lies in the Second Dynasty, giving credence to the possibility of the instigator being Khasekhemwy, the reputed builder in stone,[40] or someone even earlier.

[39] J. de Morgan, *Carte de la nécropole memphite: Dahchour, Sakkarah, Abou-sir* (Cairo, 1897), plans 7 and 9.

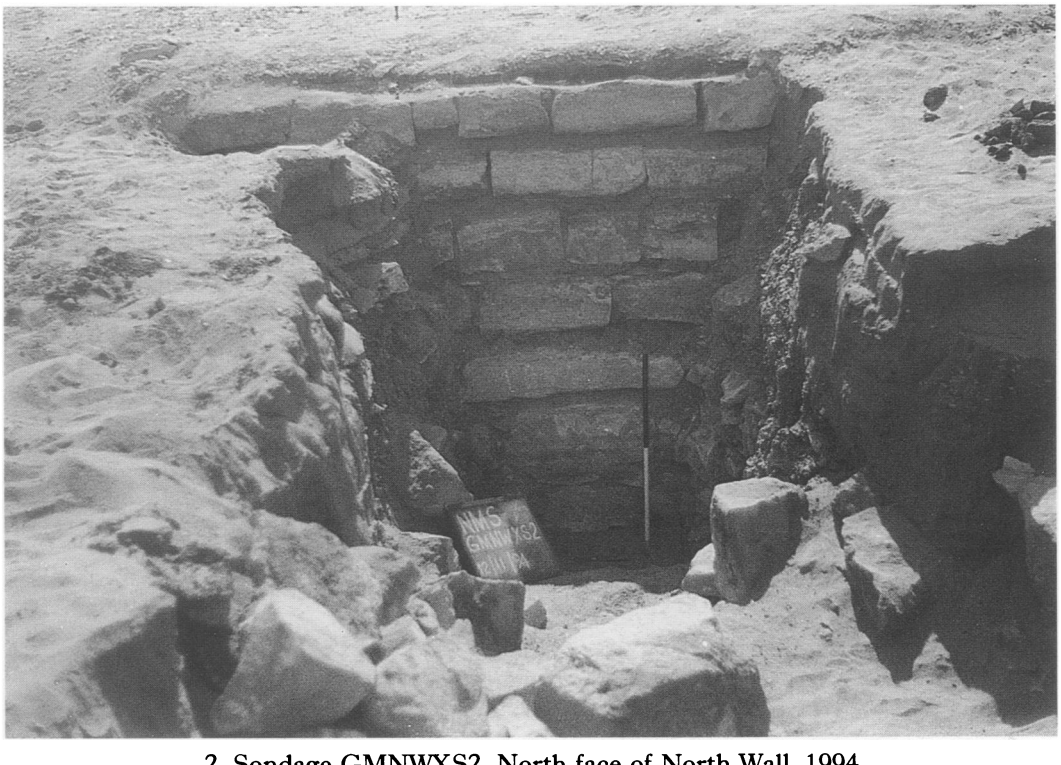
[40] H. Schäfer, 'Ein Bruchstück altägyptischer Annales' (KPAW, Berlin, 1902), 26: a year-name recorded on the Palermo stone, front, line 5, for the year after the six count reads 'building (in) stone *Mn-nṯr.t*'.

1. Sondage A7c. Mud-brick pavement looking east, 1993

2. Sondage A7c. Detail of brickwork on east edge showing mortar ridge, 1993



1. Sondage GMA8WW. East face of West Wall, 1993

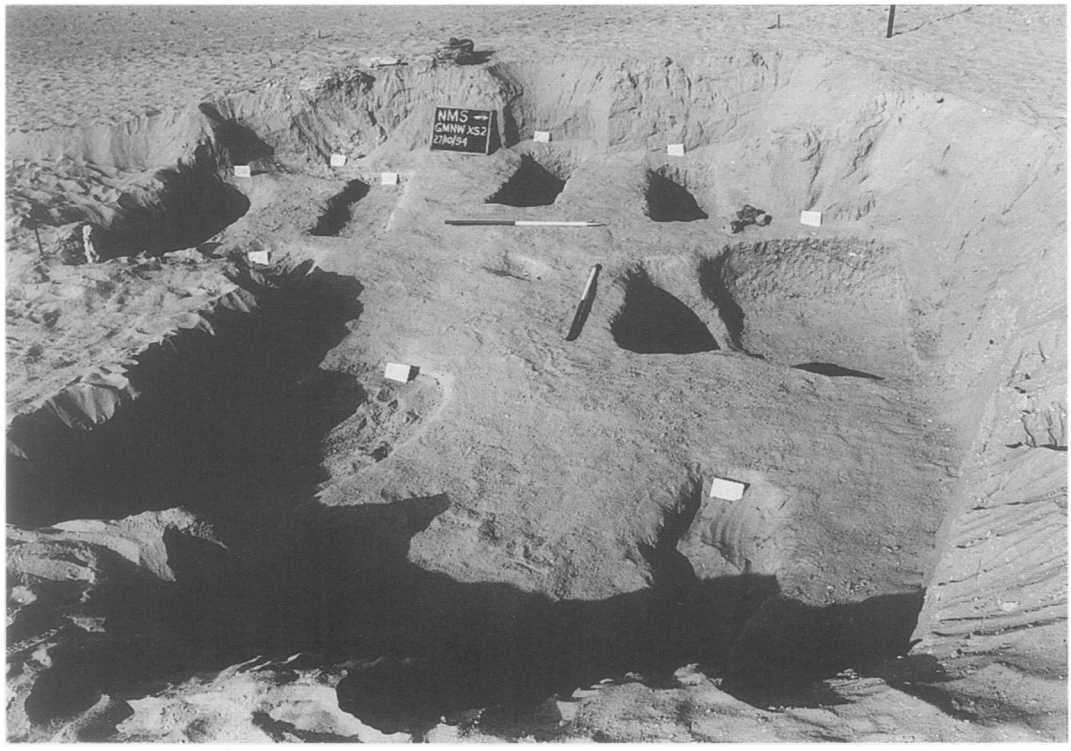


2. Sondage GMNWXS2. North face of North Wall, 1994

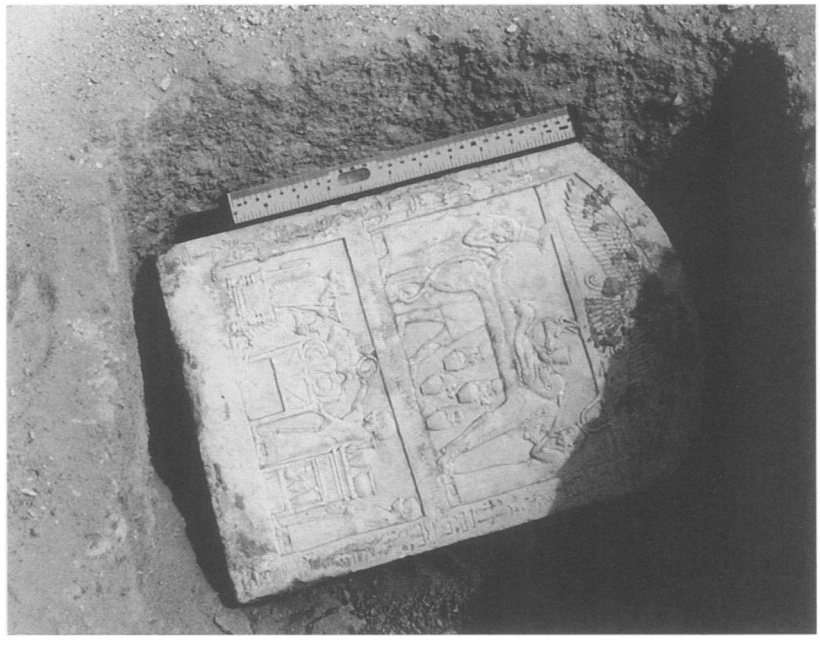
1. Sondage GMNWXS2. Edge of revetment and North Wall, 1994

2. Sondage GMNWXS2. Articulated block fill, 1994

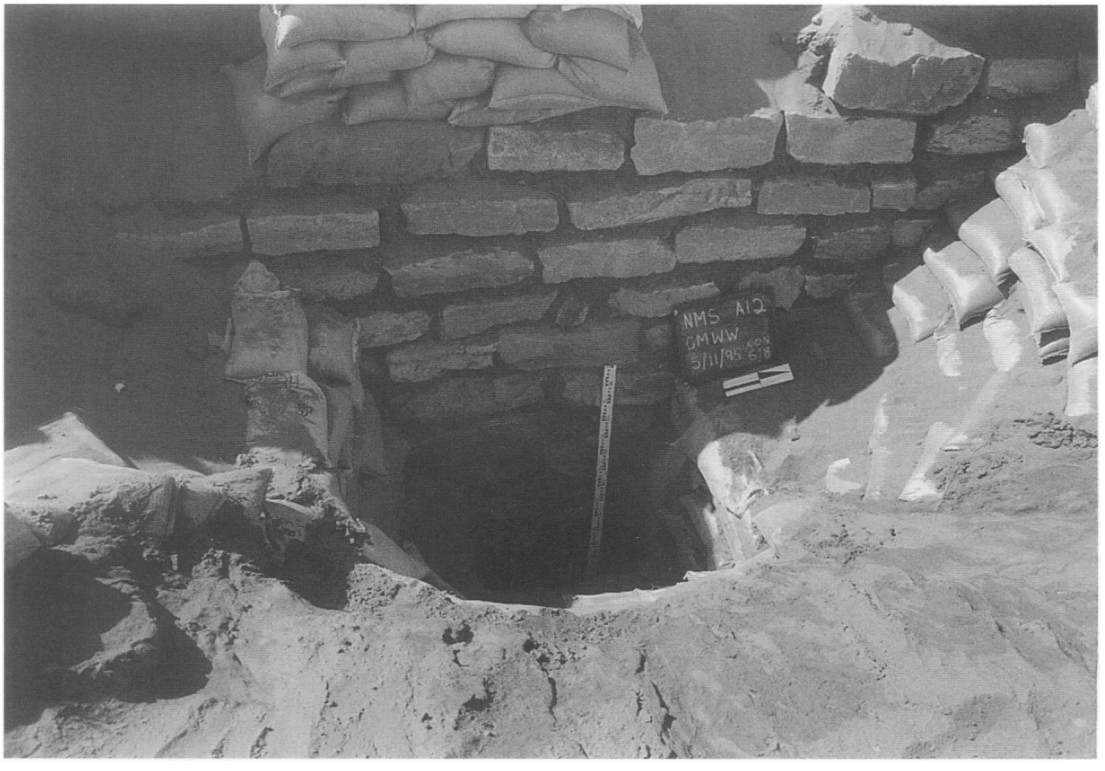
THE NMS SAQQARA SURVEY PROJECT 1993–1995 (pp. 17–53)



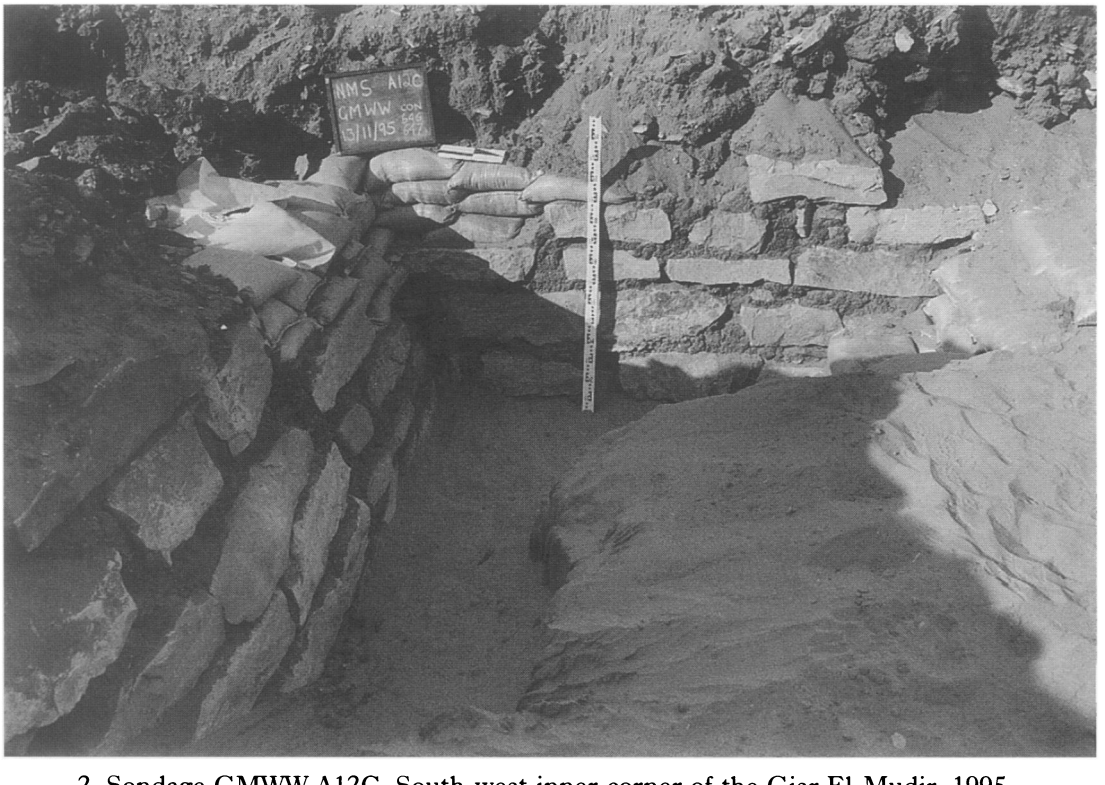
1. Sondage GMNWXS2. Rock-cut cemetery, 1994



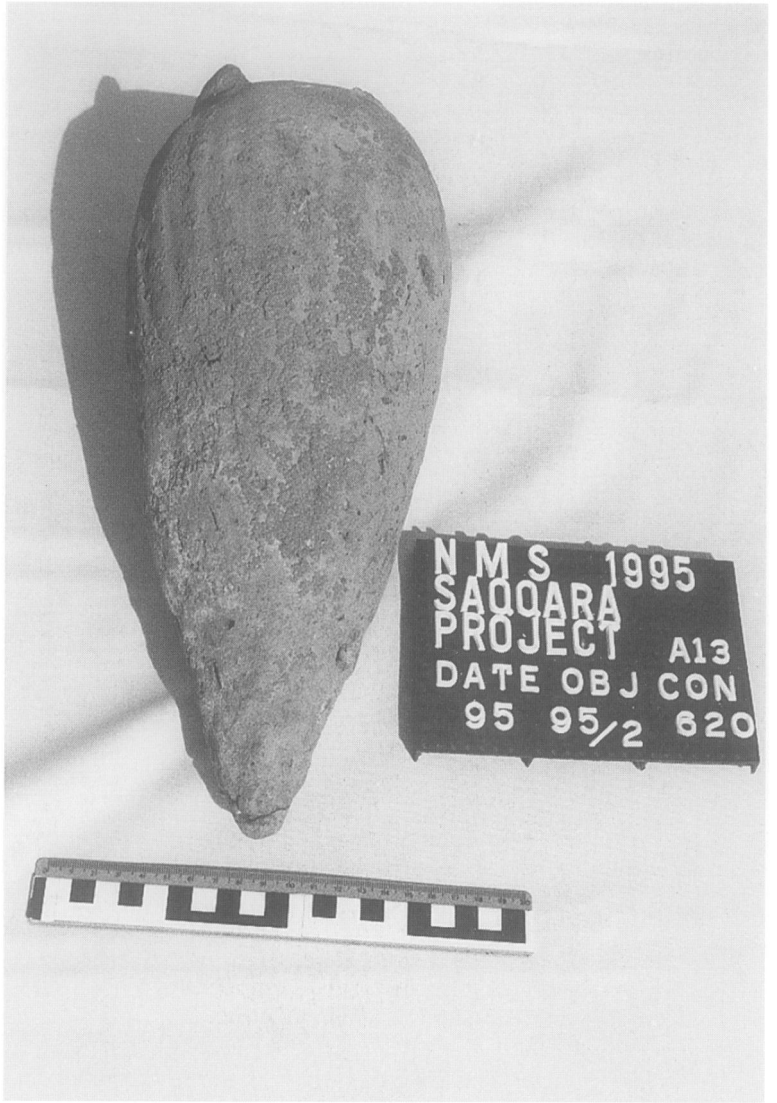
2. Sondage GMNWXS2. Stela found in grave G11B, 1994



1. Sondage GMWW A12. Exposed east face of West Wall, 1995

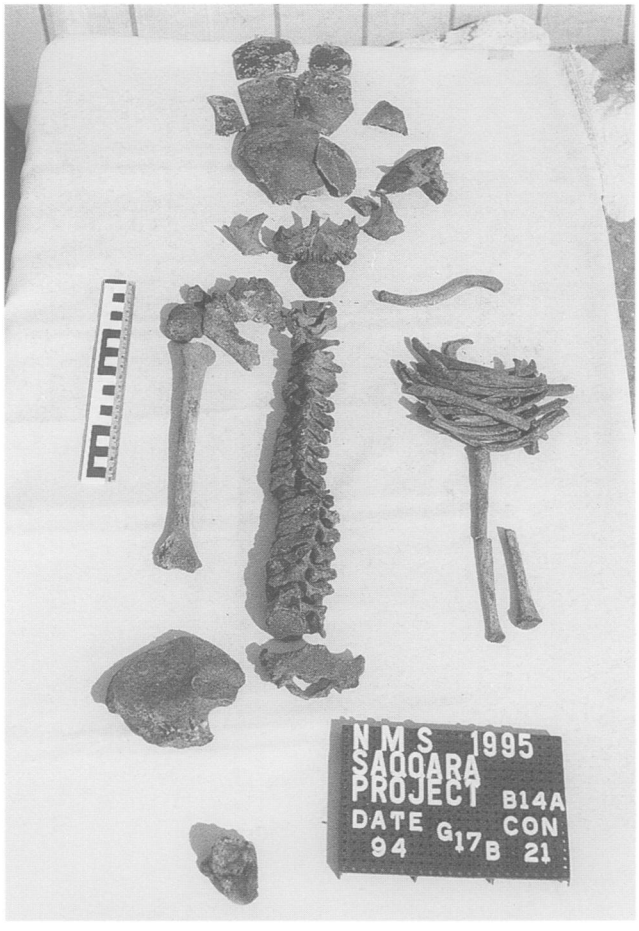


2. Sondage GMWW A12C. South-west inner corner of the Gisr El-Mudir, 1995



1. Sondage GMWW A13. Beer jar, Obj. No. 95-2, 1995

2. Sondage GMWW A12C. Water jar, Obj. No. 95-16, 1995



1. Sondage GMNWXS2. Grave G17b. Skeleton of a young child, 1994

2. Sondage GMWW A12B. Curved horn from inside wall fill, 1995

THE TEXT OF *KHAKHEPERRESENEB*: NEW READINGS OF EA 5645, AND AN UNPUBLISHED OSTRACON*

By R. B. PARKINSON

A new transcription of *The Words of Khakheperreseneb* from British Museum EA 5645, incorporating several new readings, and from a hitherto unpublished ostracon (corresponding to EA 5645 recto 10–11). A transcription of another text on EA 5645 is included.

THE text of *The Words of Khakheperreseneb* is preserved on a New Kingdom writing board in the British Museum, EA 5645.[1] Although this copy may or may not represent the complete composition,[2] its text is almost completely preserved, despite several uncertain readings and one lacuna. The composition itself is generally dated to the late Middle Kingdom.[3]

Since many of the *cruces* result from uncertainties in readings in the text itself, a newly collated transcription of the writing board is provided here, including some new readings, as well as a hitherto unpublished copy of the text on an ostracon, together with descriptions of both manuscripts. The text of the ostracon is discussed as clarifying a problematic passage, and confirming a new reading of the lacuna in EA 5645, recto l. 10.

Transcription

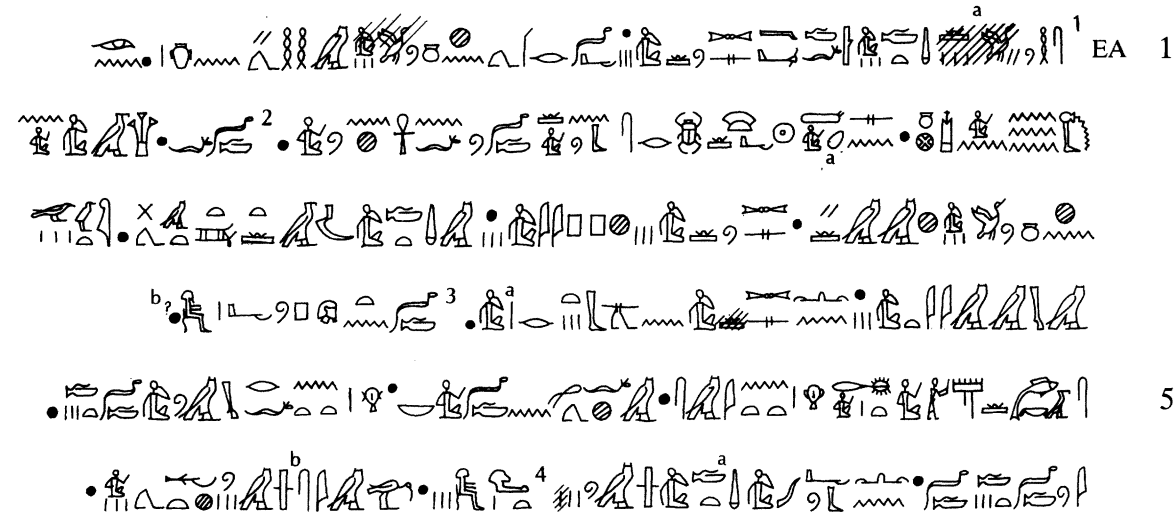
The transcription of the writing board has been collated with the original using a low-power microscope; the notes refer to the transcription by Gardiner, the comments of

*I am grateful to W. V. Davies for giving permission to republish EA 5645; to John Baines for commenting on a draft; to Morris Bierbrier, Caroline Cartwright, S. Bowman, Adel Farid, Annie Gasse, Hero Granger-Taylor, Stephen Quirke, and Donald Spanel for much advice; and to the Griffith Institute for allowing me to consult and publish Gardiner's transcription and photograph. The extent of my debt to Hans-Werner Fischer-Elfert is obvious.

[1] A. H. Gardiner, *The Admonitions of an Ancient Egyptian Sage, from a Hieratic Papyrus in Leiden* (Leipzig, 1909), 95–110, pls. 17–18. Photographs with revised translation: G. E. Kadish, 'British Museum Writing Board 5645: The Complaints of Kha-kheper-Rēʿ-senebu', *JEA* 59 (1973), 77–90. Partial bibliography in R. B.Parkinson, 'Teachings, Discourses and Tales from the Middle Kingdom', in S. Quirke (ed.), *Middle Kingdom Studies* (New Malden, 1991), 111–12 (no. xiv); see now P. Vernus, 'L'intuition de Khâkheperrêseneb' in idem., *Essai sur la conscience de l'histoire dans l'Egypte pharaonique* (Paris, 1995), 1–33; R. B. Parkinson, *'Khakheperreseneb* and Traditional Belles Lettres', in P. Der Manuelian (ed.), *Studies in Honor of William Kelly Simpson* (Boston, 1996), II, 647–54; G. Moers, *Der Aufbruch ins Fiktionale: Reisemotiv und Grenzüberschreitung in ägyptischen Erzählungen des Mittleren und Neuen Reiches* (PhD dissertation; Göttingen, 1996), 113–17, 145–8.

[2] E.g. G. Posener, 'Les richesses inconnues de la littérature égyptienne (Recherches littéraires I)', *RdE* 6 (1951), 37 ('seulement le début'); S. Herrmann, *Untersuchungen zur Überlieferungsgestalt Mittelägyptischer Literaturwerk* (Berlin, 1957), 48, n. 4; B. Ockinga, 'The Burden of Khakheperrēʿsonbu', *JEA* 69 (1983), 88. See below, p. 66.

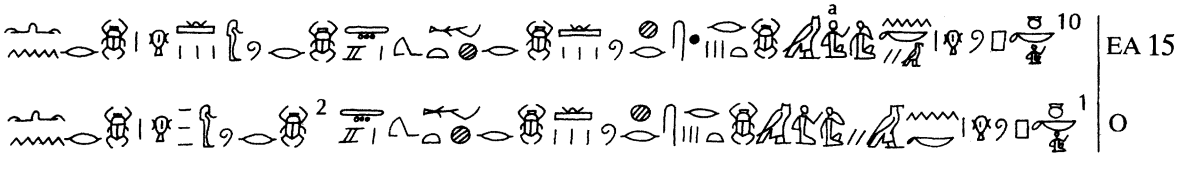
[3] P. Vernus places it in the Thirteenth Dynasty: *Future at Issue. Tense, Mood and Aspect in Middle Egyptian: Studies in Syntax and Semantics* (YES 4; New Haven, 1990), 188; *Essai*, 2–4.



EA 1

5

10

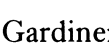


EA 15

O

Notes

1a  Faint traces, but certain (contra Kadish's suggestion of *ḏdwt*: *JEA* 59, 79 n.a).

2a  So Kadish, *JEA* 59, 79 n. c; contra Gardiner, *Admonitions*, pl. 17 ().

4a  So Vernus, *Essai*, 6; the resemblance to *ḫrw* (Gardiner, *Admonitions*, pl. 17) is probably due to a slip of the pen. In *sbwt*, the plural strokes are not certain, and the sign could be read as a  : .

4b The *s* of *sḫ*ꜣ*k* = *j* is very close to the preceding sign and written with a full pen; there is a very faint trace of red between them (not noted by Gardiner).

6a There is a stroke before the *dt*, apparently an error or a palimpsest trace.

6b This area is heavily smudged (the smudge running from l. 4); I can see no traces of any sign between the  and the ; contra Vernus, *Essai*, 6, 11–12, n. r (reading *gmj*〈*j*〉-*s*[*t*]).

8a  So Vernus, *Essai,* 7. A simple stroke after the *s*.

8b So Kadish, *JEA* 59, 81 n. t, and Vernus, *Essai,* 7; contra Gardiner, *Admonitions*, pl. 7 (reading *ꜣqt*).

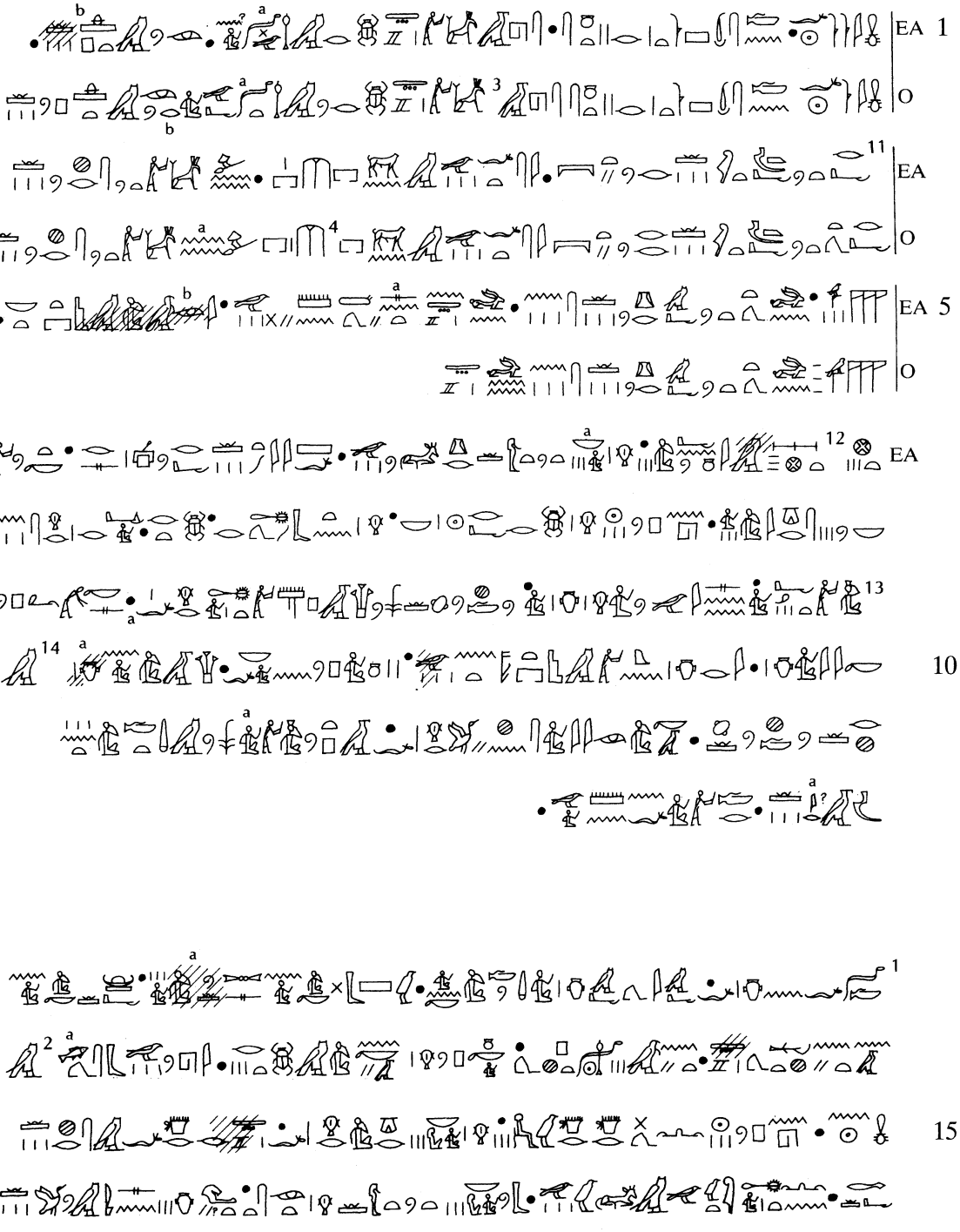
9a 

10a A very faint verse point, not seen by Gardiner.

11a  So Gardiner, *Admonitions*, pl. 17; contra Vernus, *Essai*, 7 (*wḥmjj*).

14a So Gardiner, *Admonitions*, pl. 17; now very faint.

15a  So Gardiner, *Admonitions*, pl. 17.


EA 1
O
EA
O
EA 5
O
EA
10
1
15

1a  Gardiner read *ḥḏ-n =j* (pl. 17), as did Kadish (*JEA* 59, 81–2 n. hh); Buchberger reads *ḥḏ.n = w* (*Transformation und Transformationat: Sargtextstudien*, I (ÄA 52; Wiesbaden, 1993), 565–6). The  is certain, although the  above it could conceivably be a  . See below for discussion.

1b Unread by Gardiner. The determinative is similarly shaped to that in verso l. 5 (p. 61, n. 6a). The traces are obscure, but certain: 

2a  So Gardiner, ms.

2b  Small, like a  . Contra Gardiner, ms: ; cf. of *mḥrw* in l. 4.

4a Gardiner, ms, notes 'possible? smudged and welded together'.

5a  The bottom sign is a short stroke: read ⟨*m*⟩-*sn*{*t*}*jj* or ⟨*m*⟩-*sn*{*n*}*jj*? (Cf. e.g. *Urk.* IV, 2027.11 (Tutankhamen 'Restoration' stela): *m-snjj-mnt*).

5b Traces certain.

7a  Perhaps a cramped writing of the usual orthography of *bw-nb*, with  written over the with a freshly refilled pen?

9a There are traces of a  between ll. 13 and 14 here. Although perhaps palimpest, it is more likely to be a large written as a flourish at the bottom of the board, which was then corrected into a smaller one, as the scribe realised he could squeeze another line onto the bottom of the board.

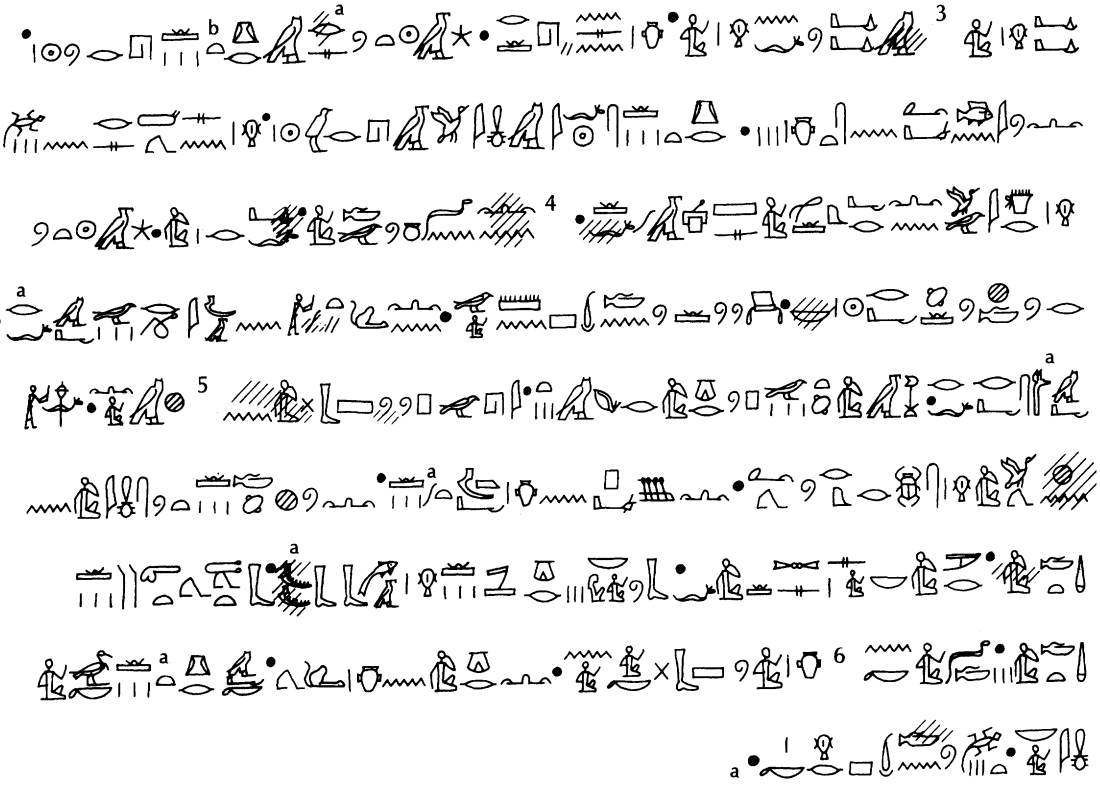
10a Certain, though slightly blotched and fused together.

11a 

12a  Contra Gardiner, *Admonitions*, pl. 18 ( ; cf. ibid. 105, where he comments, 'one is tempted to conjecture *mꜣjr*').

13a So restored by Gardiner, *Admonitions*, 105; all traces worn away.

14a Nothing lost after this.



Kadish, and, most recently, the transcription of the opening part of the text by Vernus (see n. 1). The transcription of the ostracon is based on an unpublished manuscript transcription by Gardiner (referred to in the notes), now in the Griffith Institute, Oxford, and has been collated with a photograph in the same collection.[4] See pp. 64–5.

Writing board, EA 5645

The provenance of the writing board is not recorded in the Departmental records of the British Museum. EA 5645 and a very similar writing board, EA 5646, can, however, be identified with items in the Salt sale of 1835. They are described as 'two tablets of wood, covered with polished composition, and written upon on both sides with Hieratic characters *one 21 inches by 12, and the other 17 by 11*', and the provenance is listed as Thebes.[5]

[4] Griffith Institute, Gardiner photograph AHG/31.58; Gardiner MSS, Notebook 51, p. 7; see D. N. E. Magee and J. Malek, *A Checklist of Transcribed Hieratic Documents in the Archive of the Griffith Institute* (Oxford, 1991), 46 (labelled '?').

[5] *Second Edition of the Catalogue of the Highly Interesting and Magnificent Collection of Egyptian Antiquities, the Property of the Late Henry Salt, esq.*... (London, 1835), 24, lot no. 307. The boards are mentioned together in *Synopsis of the Contents of the British Museum* (53rd edition; London, 1848), 219. The two writing boards need not have been found together, although their similarity is striking; EA 5646 contains a hymn to Thoth (photograph in R. Parkinson and S. Quirke, *Papyrus* (London, 1995), 20, fig. 8). Vernus suggests the area of Deir el-Bahri as a findspot for EA 5645, perhaps by analogy with the slightly earlier Carnarvon tablets discovered some three-quarters of a century later: 'Schreibtafel', *LÄ* V, 707, no. 17.

1a  So Gardiner, *Admonitions*, pl. 18 (Kadish's doubts are unnecessary: *JEA* 59, 83 n. iii).

1b Large like a  ; contra Gardiner, *Admonitions*, pl. 18 ( ).

4a  See n. 5a.

5a Traces of red before  : either palimpsest or a misplaced and subsequently erased verse-point; there are red traces also above . Emend text to *nn-phtj n-mȝjr ⟨nḥ⟩m:{r}f-⟨sw⟩ m-ꜥ-wsr-r:f* (Gardiner, *Admonitions*, 107–8, n. a; for parallel phrases see, e.g., J. M. A. Janssen, *De traditioneele egyptische Autobiografie vóór het nieuwe Rijk*, I (Leiden, 1946), 72–3 [Bh. 3–7, 10, 15]), or to *nn-phtj n-mȝjr m⟨k⟩t:f-⟨sw⟩ m-ꜥ-wsr-r:f* (Kadish, *JEA* 59, 83 n. nnn), a less likely reading (see n. 4a above).

6a  So Gardiner, *Admonitions*, 107 n.c (also considering  as a possibility). The determinative is to be read thus, although it resembles  here and in *grg* (contra Gardiner, *Admonitions*, pl. 18 and n. f, reading).

7a  Unread by Gardiner. So S. Hermann, *Untersuchungen*, 52 n. 1; compare *Eloquent Peasant* (ed. Parkinson) B1 138.

8a See n. 6a.

9a Traces of palimpsest here: 

The writing board (pls. X–XI) measures 55.5 × 29–30 cm (maximum—very close to the size of the larger board described in the sale catalogue), and is *c.* 5 mm thick.[6] From surface observation it seems possible that the board is made up out of at least two pieces of wood. Caroline Cartwright of the Department of Scientific Research, British Museum, has provided the following analysis of a sample of the wood:

> Standard techniques of optical microscopy were used to identify the wood through examination of the transverse, radial longitudinal, and tangential longitudinal sections. The following anatomical structure was observed: moderately large vessels (90–200 microns in tangential diameter) sparsely scattered in a radial arrangement or in small clusters, vessel tyloses, simple perforation plates, round and slit-like vessel pitting, medium thick-walled fibres, banded 6–12 seriate parenchymata in tangential arrangement alternating with bands of fibres, two distinct widths of heterocellular rays (1–4 seriate and 5–12 seriate) and a few latex tubes in the rays. The wood closely matches reference collection specimens and textual descriptions of *Ficus sycomorus*, sycomore fig.[7] There is much confusion over the term sycomore fig (*Ficus sycomorus*): sycomore fig is one of the species of fig which belong to the *Ficus* genus of the family Moraceae;

[6] Photographs in Kadish, *JEA* 59, pls. xxxii–xxxiii; colour: S. Quirke and A. J. Spencer, *The British Museum Book of Ancient Egypt* (London, 1992), 137, fig. 106. For writing boards in general, see Vernus, *LÄ* V, 703–9.

[7] E. A. Wheeler et al., *Computer-aided Wood Identification* (North Carolina Agricultural Research Service Bulletin 474, 1986); A. Fahn, E. Werker and P. Baas, *Wood Anatomy and Identification of Trees and Shrubs from Israel and Adjacent Regions* (Jerusalem, 1986).

it is not to be confused with sycamore (with a different spelling) which is used for *Acer* and *Platanus* species of the family Aceraceae.[8] *Ficus sycomorus* is recorded as being native to Egypt and has been used extensively in antiquity with other indigenous timbers for coffin and other funerary artefact manufacture.[9]

According to Vernus, writing boards were often made of sycomore (fig).[10]

There is a hole at the right end of the recto/front of the board, and the stucco between the hole and the edge has been shaped by the string with which the board was suspended.[11] There is a substantial layer of stucco (*c.* 1 mm) on both sides, laid over a layer of cloth, which is visible at the bottom left corner of the recto, along the top edge of the recto (where it has peeled away), and at the top right corner of the verso. The cloth visible at the bottom corner of the recto[12] is plain 'tabby'-weave linen cloth (yarn S-spliced, S-twisted); it is an unusually open weave, *c.* 11 × 8 threads per cm, which is appropriate for its use here.[13] The cloth is not always visible at the broken edges of the board, suggesting that it did not cover the entire two surfaces of the board before the gesso was laid on. Up to the end of the Eighteenth Dynasty, the provision of a layer of cloth was a common practice to help adhesion of the layer of gesso to the wood.[14] The surface of the gesso is cracked and there are some losses to the surface in places, especially at the edges; the bottom edge when suspended (that is, the left edge of the recto) shows the most damage, and the gesso has been lost up to over 1 cm from the edge in places. Two large cracks spread from this edge.

As noted in the original sale catalogue, the gesso appears polished (as does that of EA 5646), and shows evidence of the board's having been used several times before the present text was copied out: there is a black speckling of illegible palimpsest traces around recto ll. 5–9; red palimpsest traces are visible on the recto and the lower half of the verso. Between recto ll. 13 and 14 there is a faint sign, which could be palimpsest, but is more probably an erased mistake (see p. 59, n. 9a). There are also illegible palimpsest traces immediately after the end of the final short line of *Khakheperreseneb* (verso l. 6: see p. 61, n. 9a) and also towards the left edge of the board level with this line. These traces are the result of thorough erasure, and cannot be read; they could be the remains of another earlier text that was laid out in a very similar manner to *Khakheperreseneb*, or they could be the remains of a continuation of the copy of *Khakheperreseneb* which is now lost. Since the erasure of the lost text did not at all effect l. 5 of *Khakheperreseneb* immediately above it, I consider it probable that the palimpsest traces belong to a text that was erased before *Khakheperreseneb* was copied onto the board.

The writing is rather smudged in places (e.g. recto l. 4), perhaps due in part to the non-absorbent nature of the surface. In places the writing is very faint, and almost completely rubbed away, although there is no damage to the surface; this is noticeable

[8] See F. N. Hepper, *Pharaoh's Flowers: The Botanical Treasures of Tutankhamun* (London, 1990), passim.

[9] R. Germer, *Flora des pharaonischen Ägypten* (Mainz am Rhein, 1985), 25–7; Hepper, *Pharaoh's Flowers*, 58–9; M. A. Zahran and A. J. Willis, *The Vegetation of Egypt* (London, 1992), 373.

[10] *LÄ* V, 704, without reference; his identification of jujube as a material is based on a textual reference (705, n. 8).

[11] The small drill hole in the top left corner of the recto appears to be modern.

[12] It is not certain that all the cloth under the gesso is from the same piece, or of the same type.

[13] Description kindly provided by Hero Granger-Taylor.

[14] Vernus, *LÄ* V, 704.

along the upper edges of the recto and verso (p. 57, n. 1a; 59, n. 13a), where the gesso is also darkened; this is probably due to handling. In general, the red is particularly faint.

Gardiner considered the palaeography to be later than that of P. Westcar, but 'not posterior to the middle of the 18th dynasty';[15] the hand seems closest to Möller's examples from the 'Lederhandschrift', dated to Amenhotep II.[16] Thus, the hand suggests a date in the early to mid-Eighteenth Dynasty,[17] a period that has produced many of the extant wooden writing boards.[18]

The text of *Khakheperreseneb* is written by a single hand, but is arranged in three paragraphs on the recto and one longer one on the verso that vary in spacing and arrangement slightly, becoming increasingly cramped. The pen width is *c.* 1.5 mm (measured on vertical strokes) throughout; the density of ink seems more even on the verso than on the recto, but this difference may be due to preservation. The verso is much more tightly written than the recto. The writing is occasionally unevenly spaced with slight gaps between signs (e.g. recto l. 6: *r*-[gap]-*sw*ꜣ*wt*), possibly due to the scribe's attempts to avoid writing over visible palimpsest traces.

The paragraphs are each of four to six lines, suggesting an exercise of an apprentice scribe written on several occasions; a date, 'month 2 of Shemu, day 28', in red at the end of the second paragraph also supports this.[19] The verse points seem uneven in certain places: they are almost certainly unreliably placed in recto l. 6[20] and l. 12, and some verse points are probably omitted in recto l. 10. The text seems corrupt at least in verso l. 4 (see p. 61, n. 5a),[21] and scribal errors also occur in recto l. 11 (⟨*r*⟩-*rwtj*; ⟨*m*⟩-*sn*{*n*}*jj*(?)-*mnj*).

Below *Khakheperreseneb* there are written three lines of another text, in a larger and more careful hand, apparently that of a different scribe. This short, hitherto unpublished, excerpt seems to be completely preserved; there are no traces of any erased part of further lines above or below it. It was presumably written on the board after the copy of *Khakheperreseneb*. I offer here a transcription, and a tentative translation:

[15] *Admonitions*, 96.

[16] G. Möller, *Hieratische Paläographie*, I (Leipzig, 1909). The same conclusion is suggested by the orthography of *ṯsw* (l. 1), according to E. Dévaud's survey of orthography as a means of dating manuscripts: *L'age des papyrus égyptiens hiératiques d'après les graphies de certains mots (de la XII^e dynastie à la fin de la XVIII^e dynastie)* (Paris, 1924), no. 22; the orthography is distinct from that of manuscripts postdating the early New Kingdom P. Hearst.

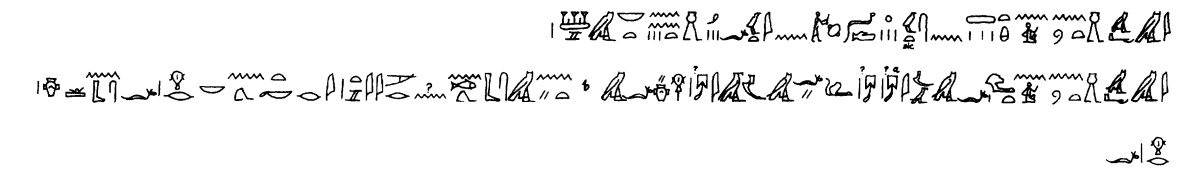
[17] S. Quirke, personal communication.

[18] Vernus, *LÄ* V, 706–7, nos. 6–18. The hand of EA 5645 looks in general similar to that of Louvre 693, which contains apprentice's excerpts from the *Teaching of Khety* and the *Hymn to the Inundation* (Vernus, *LÄ* V, 707, no. 18; A. Piankoff; *RdE* 1 (1933), pl. 6).

[19] See A. Erman, *Die ägyptischen Schülerhandschriften* (APAW 1925.2; Berlin, 1925), 8–9; H. Brunner, *Altägyptische Erziehung*[2] (Wiesbaden, 1991), 76; A. McDowell, 'Student Exercises from Deir el-Medina: The Dates', in *Studies in Honor of William Kelly Simpson* II, 601–8.

[20] E.g. *nn-sḫꜣ.ti.fi-*•*-rn = f n-kt-ḫy*•, 'There is none who will remember • his name to others •.'

[21] One major crux for emendation is recto l. 5, where one can read *n-md = t(w) n-mdt* or *n*⟨*n*⟩ *mdt n-mdt* (see Parkinson, in *Studies in Honor of William Kelly Simpson* II, 651, n.a.



Notes to the transcription

2a 

2b 

Have brought to me bread of wheat, fat of flesh,[22] all that is brought from the meadow!
Have brought to me one whose front[23] is a lion, whose rear is a lion, whose middle is a [illegible],[24] which is slipping away (*sbn*) for(?) the bank! As for any who draws near to it, (their) heart shall be healthy (*snb*) because of it.

I cannot identify the text, but the items requested, and the wordplay between *sbn* and *snb* suggest that it is a magico-medical incantation phrased as a letter, rather than a model letter, as suggested by Vernus.[25] The second line may refer to a figure to be used in a magical performance, perhaps in connection with a riverine location.[26]

The ostracon

The preservation of *Khakheperreseneb* on a writing board suggests that it was a text that was copied by apprentice scribes, and one might therefore expect to find copies on ostraca. An ostracon containing a text with some similarities to *Khakheperreseneb* was discovered near the tomb of Senenmut (TT 71), in the forecourt of TT 850.[27] There is, however, no reason to regard it as certainly part of the same composition.[28] Over twenty

[22] *Wb.* V, 632.4, attested in magico-medical texts: P. Lond. Med. 13.7.

[23] The tripartite description recalls the description of the Eater of the Dead in Nineteenth Dynasty representations of the judgement of the dead: C. Seeber, *Untersuchungen zur Darstellung des Totengerichts im alten Ägypten* (MÄS 35; Munich, 1976), 164, n. 748.

[24] The horn-like element of the illegible group is suggestive of a group including  , or possibly a sign depicting an animal of some type: see Möller, *Hieratische Paläographie* I, 13: nos. 138–9 (), 142 ().

[25] *LÄ* V, 707, (no. 17). Fischer-Elfert (personal communication) notes that the combination of epistolary phrasing and a magical figure recalls ostracon Deir el-Medina 251, a letter requesting that a magical image be made for someone (text: J. Černý, *Catalogue des ostraca hiératiques non littéraires de Deir el Médineh*, IV (DFIFAO 6; Cairo, 1939), pl. 3; see J. F. Borghouts, 'Divine Manifestation in Ancient Egypt and its Manifestations (*bꜣw*)', in R. J. Demarée and J. J. Janssen (eds), *Gleanings from Deir el-Medîna* (Leiden, 1982), 15–18).

[26] For example, to safeguard a water-crossing; Fischer-Elfert, personal communication.

[27] W. Hayes, *Ostraka and Name Stones From the Tomb of Sen-mūt (no. 71) at Thebes* (New York, 1942), 4, 28, pl. 26 (no. 146).

[28] The text reads:[1] *ḏd=j n-jb* [...][2] *sn=j* [...][3] *ḥꜣtj* [...], (verso)[1] *sḏr=j* [*m* ...][2] *sn=j-tꜣ-jn* [...]; (recto) 'I say to [my] heart: [...]/I pass [...]/heart(?) [...]; (verso) I sleep [in ...]/I pass the wa[di(?)]'. The address to one's heart is the main similarity with *Khakheperreseneb*, but at least one other protagonist of Middle Kingdom wisdom literature addresses his own heart: *Neferti* (ed. Helck), 3f. The use of the demonstrative *tꜣ* on the ostracon is not paralleled in *Khakheperreseneb*.

years after his publication of EA 5645, Gardiner stated that *Khakheperreseneb* was attested on an ostracon then in the Cairo Museum, but this has remained unpublished;[29] in 1995 Hans-Werner Fischer-Elfert very kindly drew my attention to the existence of a photograph (pl. XII) and transcription of the ostracon in Gardiner's files in the Griffith Institute (see n. 4). I have been unable to confirm its present location in any more detail.

There is no record of a museum number for the ostracon, and no indication of provenance.[30] It is described in the notebook as a 'heavy lime-stone slab. 10 × 5.3 (high) × 4 (thick) cm. Writing is prob[ably] 18th Dyn[nasty]'. From the photograph the hand appears to be Tuthmoside,[31] which would make it roughly contemporaneous with the writing board; the text on the ostracon is parallel to recto ll. 10–11 of the board. There are no verse-points.

Observations on the parallel text

The excerpt on the ostracon has implications for the unity of *The Words of Khakheperreseneb* as it is extant. First, it suggests that the passages on the writing board are not random excerpts, since two apprentice scribes start their exercises at the same point: both the ostracon and one of the paragraphs of the writing board begin 'I am meditating on what has happened'. Thus the paragraphs on EA 5645 may represent divisions of the original composition, such as metrical stanzas or groups thereof, rather than randomly-chosen selections.[32]

The layout of the paragraphs on the board is distinctive. It has been considered as evidence for the text's being a series of excerpts of approximately the same number of lines, which thus need not comprise the full text.[33] The laying-out of parts of a single text in paragraphs is unusual. Excerpts from different literary texts could be arranged on boards in this way, as, for example, on the early Eighteenth Dynasty board Louvre 693.[34] However, on Tablet Brooklyn 16.119, dated by Vernus to the start of the Eighteenth Dynasty, there are six lines of the *Teaching of Amenemhat*;[35] lines 1–3 end with a short line and comprise stanza 3 of the Teaching (ed. Helck, 3a–d), while ll. 4–6 comprise the next stanza, except for the final word-group (ed. Helck, 4a–d). Although these 'paragraphs' are not separated by any space between the horizontal lines, being indicated only by the short line at the end of the first excerpt, this closely contemporaneous parallel suggests that the paragraphs of EA 5645 could represent consecutive stanzas of a single

[29] Gardiner briefly mentioned it as containing a parallel to EA 5645: *Hieratic Papyri in the British Museum. Third Series: Chester Beatty Gift*, I (London, 1935), 40, n. 8.

[30] I have been unable to trace any further information about it. The figure 774 visible on the photograph refers to Gardiner's numbering system (D. Magee, personal communication).

[31] S. Quirke, personal communication.

[32] Literary excerpts on ostraca often start at the beginning of a stanza, and can correspond to a single stanza (sometimes with the first verse of the following stanza): see, e.g., W. Helck, *Der Text der 'Lehre Amenemhets I. für seinem Sohn'* (KÄT; Wiesbaden, 1969), 6; id., *Die Lehre des* Dwꜣ-Ḫtjj, I (KÄT; Wiesbaden, 1970), 8–11.

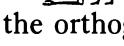
[33] E.g. Kadish, *JEA* 59, 84–5.

[34] The two texts are the *Hymn to the Inundation* and *Teaching of Khety*: Piankoff, *RdE* 1, pl. 6; Vernus, *LÄ* V, 707 no. 18 with references.

[35] Vernus, *LÄ* V, 707 no. 12. Published by Gardiner, in [P. Jouguet] (ed.), *Mélanges Maspero*, I. *Orient Ancien* (MIFAO 66; Cairo, 1935–8), 480–4, with plate (unnumbered). There are red verse-points, but no rubrics. Text: Helck, *Der Text der 'Lehre Amenemhets I. für seinen Sohn'*, 21–9.

composition which were used as scribal exercises. Rubrics are not employed on Brooklyn 16.119[36] or EA 5645, and paragraphing could be an alternative to using rubrics for separating sections or stanzas of a text.

Second, the fact that the ostracon duplicates the text known from EA 5645, and does not provide any further verses that are not on the writing board, may suggest that EA 5645 is a complete copy of the composition; this reinforces the impression of coherence given by the text, especially the final verses.[37] Although no certain conclusion can be drawn, the ostracon may increase the evidence for the hypothesis that the extant *Khakheperreseneb* is a complete copy of the original composition.[38]

The two manuscripts of *Khakheperreseneb* seem to belong to closely similar textual traditions, if not the same one: both write *nkꜣ* in recto l. 10 (= ostracon l. 1) as if it were a noun *nkꜣjj*  , 'einer der nachdenken muss'.[39] In l. 3, the ostracon has a distinct writing of *rdj.tw* (), almost as if *rdj* = *t*(*w*)-*jwt*, but this is probably under the influence of the orthography of *wn*{*t*} = *tw* () in the next line, rather than being the result of a variant in the textual tradition.

The parallel text supplements a problematic passage in EA 5645. In recto l. 10, the group transcribed by Gardiner as if *ḥḏ.n* = *j* has been variously read: Gardiner suggested 'waste(?)' without comment;[40] S. Herrmann suggested 'Der Aufruhr des Landes (*šhꜣ tꜣ*) wirkt sich zu seinem Schaden aus (?) (*ḫpr m-ḥḏ*)';[41] Kadish suggests 'a wasteland to me' (*ḥḏ-n* = *j*).[42] Buchberger reads *ḥḏ.n* = *w*, and renders '(und) hat (sich) in eines, das sie! zerstört haben, transformiert',[43] comparing a parallel verse in *Merikare*:

mk-[*tꜣ* (?)]*-ḥḏ.n-st jrw m-spꜣwt*
Look, the [land(?)] which they had destroyed is made into nomes.[44]

His reading was suggested on the basis of Gardiner's published sketch, but it is not compatible with the signs that can be observed on the writing board,[45] nor is any parallel reading compatible with the signs on the ostracon.[46] A reading of *ḥḏ.t* = *j* or *ḥḏ* = *j* is possible on the ostracon, although this latter produces an orthography with an otherwise

[36] I am grateful to Donald Spanel for confirming this.

[37] Noted by Ockinga, *JEA* 69, 92–3. I now discount my suggestion that the word *šhwj*, 'selection', in the title may allude to the partial nature of the copy (in *Middle Kingdom Studies*, 111–12); it is more likely to refer to the Egyptian presentation of wisdom texts as collections of choice wise sayings.

[38] The tendency to regard the extant text as incomplete has been unduly influenced by considerations of modern literary evaluation; for example, Kadish (*JEA* 59, 84) considered it unlikely that Khakheperreseneb's later reputation could have 'rested on so slender a foundation' as the text of EA 5645 alone. If the copy is complete, the composition is distinctively short, although it is almost the same length, in terms of Fecht's metrics, as the *Teaching of Amenemhat*.

[39] R. Hannig, *Großes Handwörterbuch Ägyptisch-Deutsch (2800–950 v. Chr.): Die Sprache der Pharaonen* (Mainz, 1995), 437. The reading on the board, question-marked by Gardiner (*Admonitions*, pl. 17), is fairly certain (see p. 57, n. 15a).

[40] *Admonitions*, pl. 17 n. i, 101.

[41] *Untersuchungen*, 49.

[42] *JEA* 59, 78, 81–2 n. hh.

[43] *Transformation*, 565–6.

[44] Ed. Helck, 32 = P 85. See now J. F. Quack, *Studien zur Lehre für Merikare* (GO 4, 23; Wiesbaden, 1992), 48–9, 51 n. l.

[45] See p. 59, n. 1a.

[46] See p. 59, n. 2a.

unparalleled set of determinatives (× ).[47] If *ḥḏt=j* is read, a rendering as 'what I have destroyed' (relative form) is possible, but gives little sense, and it is preferable to read 'my destruction', or 'the destruction of me' (infinitive with suffix). Thus, the sage is apparently lamenting the fact that the land has become something that is destroying him.

This raises the possibility of reading *ḥḏt=j* on the board also. This is technically possible, but a reading *ḥḏ-n=j* is more plausible (see p. 59, n. 1a; compare the writing of *mꜣ.n=j* in recto l. 5: p. 57, n. 9a). In this reading, one could understand an idiom similar to *jrj ḥḏ n=* 'to deal destruction/damage to someone' (*Wb.* III, 213.19), i.e. 'the land has become a destruction for me'. In this analysis, the two copies have semantically similar, but not identical, texts at this point, describing how 'the land has become my destruction' or 'a destruction for me'. It is doubtful whether these variants could be considered indicative of two distinct textual traditions.

At the end of recto l. 10 of the writing board, there is a damaged word group that was unread by Gardiner. Subsequent commentators have usually assumed this to have been a word with negative connotations, possibly denoting a type of place, on the basis of parallelism with the preceding verse; Lichtheim, for example, renders:

> The land breaks up, is destroyed,
> Becomes [a wasteland].[48]

When I initially examined this area of the writing board, before seeing the parallel text, I identified certain but faint traces reading *ḥtp*  (?); at first sight this reading implied a word with surprisingly positive connotations.[49] The parallel ostracon subsequently confirmed that this reading is correct. In EA 5645, the determinative might be transcribed as  , so one could understand that the land is made into 'a place of rest, i.e. burial', but this determinative is probably to be read as  , on analogy both with the peculiar writing of this group in verso l. 5 (see p. 61, n. 6a), and with the parallel of the ostracon. The phrase *jrw m-ḥtpw* can be taken as describing the land as having been made into a state of being 'gone to rest', or 'resting in peace'.[50] This is an effective piece of wordplay, which reverses the usual positive sense of *m-ḥtp* to express the reversed and fatal state of the world.

Thus, in the light of the parallel text, this problematic passage can be freely translated:

> The land is in chaos, has become my destruction,
> has been made into a state of rest.

In conclusion, one can note that the parallel text may lessen the 'marginality' of the

[47] Unless one reads *ḥḏt-ꜥ=j*, 'the destruction of my state'.

[48] M. Lichtheim, *Ancient Egyptian Literature*, I (Berkeley and Los Angeles, 1973), 147.

[49] For example, in the eulogy of Ramses IV in O. Turin 57001 recto l. 4, 'the tumultuous ones (*ḫnnw*) in this land have become peaceable ones (*ḫprw m-ḥtpjjw*)': J. López, *Catalogo del Museo Egizio di Turino*, second series, III.1 *Ostraca ieratici N.57001–57092* (Milan, 1978), pl. 1a.

[50] The verb *ḥtp* is used of dying: *Wb.* III, 191.7, 24; 192.11–16 (of the sun setting); 195.4 (*ḥtpjjw* as a term for the blessed dead).

poem for Egyptologists,[51] which has perhaps been fostered to some degree by the solitary available manuscript.[52] The second manuscript not only improves our understanding of the text in details, but also demonstrates that the poetry of this literary protagonist is attested in more than one copy, and thus that he had an established literary esteem in the early Eighteenth Dynasty, when his work was one of the corpus copied by apprentice scribes. We cannot know if the text was transmitted any later, but his reputation continued through the Nineteenth Dynasty, when he featured in the 'Daressy' relief fragment of famous forebears,[53] and was acclaimed in the 'Eulogy of Dead Writers' of P. Chester Beatty IV.[54]

[51] Vernus, *Essai*, 1–2.

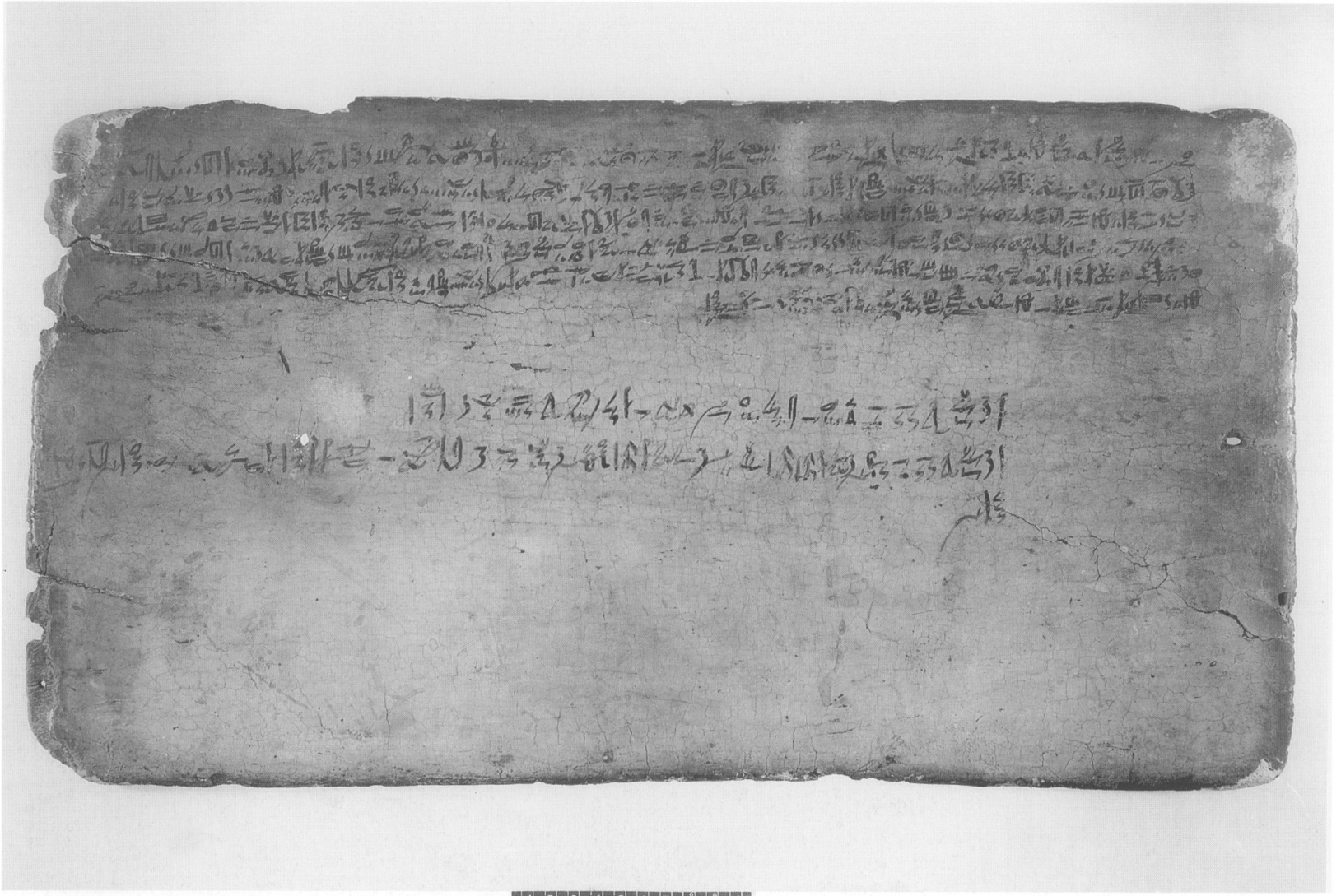
[52] Compare the remarks of O. Renaud on the sole manuscript of the *Dialogue of a Man and his Ba: Le Dialogue du Désespéré avec son Âme: une interprétation littéraire* (Cahiers de la Société d'Égyptologie 1; Geneva, 1991), 14. The assumption that *Khakheperreseneb* is unusual or unique underlies many interpretations (see Parkinson, in *Studies in Honor of William Kelly Simpson* II, 647–54).

[53] PM III.2², 571–2; Parkinson, in *Middle Kingdom Studies*, 94 n. 20. In a study of the high priests of Memphis, some of whom are mentioned on the relief, Wildung dates the fragment to the time of Ramses II ('Hoherpriester von Memphis', *LÄ* II, 1258). The identification of several of the high priests named on the relief is, however, uncertain, as their names were held by several historical figures (e.g. *Pꜣ-ḥm-nṯr*).

[54] Dated by Gardiner to the end of the Nineteenth Dynasty (*Hieratic Papyri. Third series* I, 28); P. W. Pestman suggests that the scribe was Amennakht, attested in the reigns of Ramses IV and V: 'Who were the owners, in the "Community of Workmen", of the Chester Beatty Papyri?', in Demarée and Janssen (eds), *Gleanings from Deir el-Medîna*, 161–2.

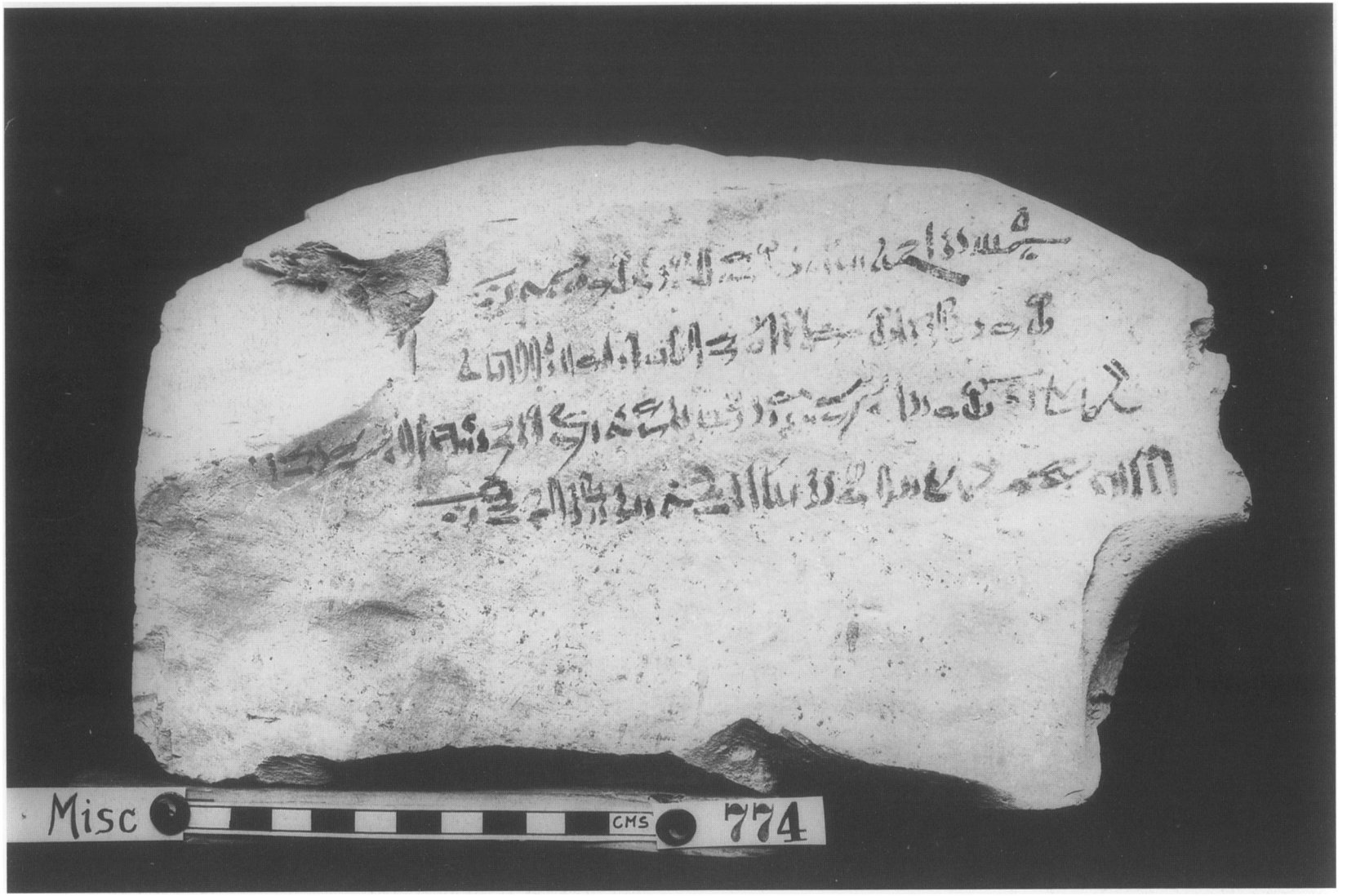
British Museum EA 5645 recto (*Copyright the British Museum*)

THE TEXT OF *KHAKHEPERRESENEB* (pp. 55–68)



British Museum EA 5645 verso (*Copyright the British Museum*)

THE TEXT OF *KHAKHEPERRESENEB* (pp. 55–68)



The ostracon of *Khakheperreseneb* (Gardiner Mss AHG/31.58)
(*Courtesy of the Griffith Institute*)

THE TEXT OF *KHAKHEPERRESENEB* (pp. 55–68)

WINE OF EGYPT'S GOLDEN AGE: AN ARCHAEOCHEMICAL PERSPECTIVE*

By P. E. McGOVERN

Neutron Activation Analysis and selective organic contents analysis were carried out for a group of 50 Malkata wine, honey, 'ale', *ben*-oil, and meat ostraca, together with seven additional New Kingdom reference samples from Thebes. Most of the ostraca and all of the reference samples form a tight chemical group, indicating that they were most likely made of a Theban marl clay and thus produced locally, perhaps in a royal workshop. Although the contents of amphoras were generally stated to have been produced elsewhere, they were evidently imported, 'rebottled', and then sealed and registered at a central facility in Thebes. The uniform procedures that were followed and the fact that most vessels were used only once may reflect the special circumstances for which they were intended—the *heb-sed*. Organic analyses confirmed the presence of wine for the wine ostraca; a tree resin, either terebinth or myrrh, was also added as a preservative, besides masking any offensiveness.

New Kingdom Egypt was a period of remarkable internationalism and cultural development,[1] reaching its highpoint during the long reign of Amenhotep III (*c.* 1391/1383–1353/1345 BC).[2] The extensive palace complex of this pharaoh in south-western Thebes, known as Malkata (Arabic 'the place where things are picked up'), was largely excavated by the Metropolitan Museum of Art's Egyptian Expedition between 1910 and 1920.[3] Several royal palaces, upper and lower class dwellings, and other facilities (storerooms, workshops, kitchens, etc.) were uncovered over a *c.* 500 by 700 m area (fig. 1).

*The analytical programme was supported by grants from the Metropolitan Museum of Art and the National Science Foundation (BNS-8801707). Neutron Activation Analysis was done at the University of Missouri Research Reactor, under the direction of Dr Michael D. Glascock and with the assistance of Dr Hector Neff. The organic analyses were carried out in collaboration with Dr Donald L. Glusker and Lawrence J. Exner in the archaeochemical laboratory of the University of Pennsylvania Museum's Applied Science Center for Archaeology. Additional samples were kindly provided by Dr Curt W. Beck (ancient terebinth resin samples from the Uluburun shipwreck and modern myrrh), Dr Kathyrn Eriksson (red lustrous spindle bottle from the Royal Ontario Museum), and Dr Helen Jacquet-Gordon (Theban ostracon from Deir el-Medineh). Dr Susan J. Allen of The Metropolitan Museum of Art was instrumental in documenting its Malkata and Theban ostraca collection. Comments on initial drafts of this paper by Drs Dorothea Arnold, Janine Bourriau, and Colin A. Hope were extremely valuable. Dr Cathleen A. Keller, who is currently preparing a full corpus of the Malkata ostraca, provided the excellent, up-to-date translations which are cited in Appendix 1 and the pl. XIII, 3 caption. Additional Theban ostraca and early Eighteenth Dynasty pottery (Appendix 2) were translated by Dr James P. Allen.

[1] E.g. N. Grimal, *A History of Ancient Egypt*, trans. I. Shaw (Oxford, 1992), 199–308; M. S. Drower, 'Syria, *c.* 1550–1400 B.C.', in *CAH*[3] II.1, 417–525; C. Aldred, *Akhenaten: King of Egypt* (London, 1988).

[2] Egyptian dynastic dates are according to the 'high' and 'low' options of K. A. Kitchen, 'The Basics of Egyptian Chronology in Relation to the Bronze Age', in P. Åström (ed.), *High, Middle or Low?*, I (Gothenburg, 1987), 40–3, 47, table 4; also see the supplement to the colloquium, K. A. Kitchen, 'Supplementary Notes on "The Basics of Egyptian Chronology" ', in P. Åström (ed.), *High, Middle or Low?*, III (Gothenburg, 1989), 153.

[3] H. E. Winlock, 'The Work of the Egyptian Expedition', *BMMA* 6 (1912), 184–90, and 'The Egyptian Expedition 1914–15: II. Excavations at Thebes', *BMMA* 10 (1915), 253–6; A. Lansing, 'The Egyptian Expedition 1916–17: Excavations at the Palace of Amenhotep III at Thebes', *BMMA* 13 (1918), 8–14; W. C. Hayes, 'Inscriptions from the Palace of Amenhotep III', *JNES* 10 (1951), 35–56, 82–111, 156–83, 231–42; also see W. S. Smith, *The Art and Architecture of Ancient Egypt*[2] (revised by W. K. Simpson; Harmondsworth, 1981), 282–95, 459, nn. 3–4 (with bibliography).

An audience pavilion, where the king appeared on a balcony before the populace on major holidays, and a temple to the principal Theban god, Amun, were located to the north. More recently, the large artificial lake or harbour on the east, Birket Habu, some smaller structures of the complex, and additional buildings to the south have been excavated by the University of Pennsylvania Museum expedition.[4]

Among the many outstanding finds from Malkata, approximately 1400 jar shoulder sherds with black-inked hieratic inscriptions (hereafter 'ostraca'; see pl. XIII, 1–3), now in the Metropolitan Museum's Egyptian art collection, shed light on goods supplied to Amenhotep III's palace, including wine, 'ale', meat, fat, various oils, milk, honey, incense, and fruits.[5] Most of the ostraca belong to the last decade of Amenhotep III's reign and state that the vessels are for the '*sed*-festival of His Majesty' in the Years 29/30, 33/34, and 37/38. The *heb-sed*, which included rites and feast days, was carried out during several months overlapping two regnal years, at intervals to ensure a monarch's survival in later life and the country's welfare. Reflecting relatively more activity in certain areas of the palace and temple complex, the Year 30 and Year 37 ostraca were concentrated in the southern, older wing (extending from the West Villas to the South Palace and including the rubbish mounds on the south), while those of Year 34 were recovered from rubbish heaps in or near the forecourt of the Amun temple, which, together with a Festival Hall attached to its northern wall, had probably been specially constructed for the second *heb-sed*. A Japanese expedition that reinvestigated the main palace uncovered part of a painting mentioning 'wine for the *sed*-festival'.[6]

A large pile of sherds, including 290 ostraca with excellently-preserved meat labels, in the south-eastern corner of the forecourt of the temple of Amun implies that amphoras supplying food for the *heb-sed* feasts were most often used only once. A single usage is also borne out by the fact that amphoras were generally opened by lopping off the sealing (see below) with the entire neck, thus making it very difficult to reuse the vessel for its original purpose.[7] In contrast, amphoras employed in the day-to-day functioning of the palace in non-*heb-sed* years had been reused more often, as shown by multiple inscriptions mentioning different years and/or goods (e.g. the undated honey inscription written over a wine inscription of Year 9—see Appendix 1 **35**).[8]

[4]B. J. Kemp and D. O'Connor, 'An Ancient Nile Harbour, University Museum Excavations at the "Birket Habu"', *The International Journal of Nautical Archaeology and Underwater Exploration* 3 (1974), 101–36; C. A. Hope, *Excavations at Malkata and the Birket Habu 1971–1974: Jar Sealings and Amphorae of the 18th Dynasty: A Technological Study* (Warminster, 1977) (subsequently Hope, *Malkata Sealings*); M. A. Leahy, *Excavations at Malkata and the Birket Habu 1971–1974: The Inscriptions* (Warminster, 1978) (subsequently Leahy, *Malkata Inscriptions*).

[5]See Hayes, *JNES* 10, for find-spots, translations, and historical importance of the amphora ostraca. Although strictly inaccurate, the term 'ostraca' is used here for convenience. An additional 245 ostraca from the University of Pennsylvania Museum excavations are extensively discussed in Leahy, *Malkata Inscriptions*. The latter, from an area south of the Metropolitan excavations, are primarily wine dockets dating to the first *sed*-festival.

[6]S. Nishimoto, 'Notes on the Wall Fragments Bearing the Inscription "irp" (wine) Found from Malkata Palace', *Bulletin of Science and Engineering Research Laboratory, Waseda University* 131 (1991), 9–13; also see Group for Publishing Papers in Honor of Professor Watanabe Yasutada on the Occasion of His 70th Birthday (ed.), *Studies on the Palace of Malqata: Investigations at the Palace of Malqata, 1985–1988* [Japanese] (Tokyo, 1993), 89–98, fig. 2-2-4.3, pl. 6d.

[7]Hope, *Malkata Sealings*, 8; C. A. Hope, 'The Jar Sealings', in A. el-Khouli et al., *Stone Vessels, Pottery and Sealings from the Tomb of Tutʿankhamun* (Oxford, 1993), 132 (subsequently Hope, 'Tutʿankhamun Sealings').

[8]Also see Hayes, *JNES* 10, 39–40, and Hope, 'Tutʿankhamun Sealings', 132–3, n. 109.

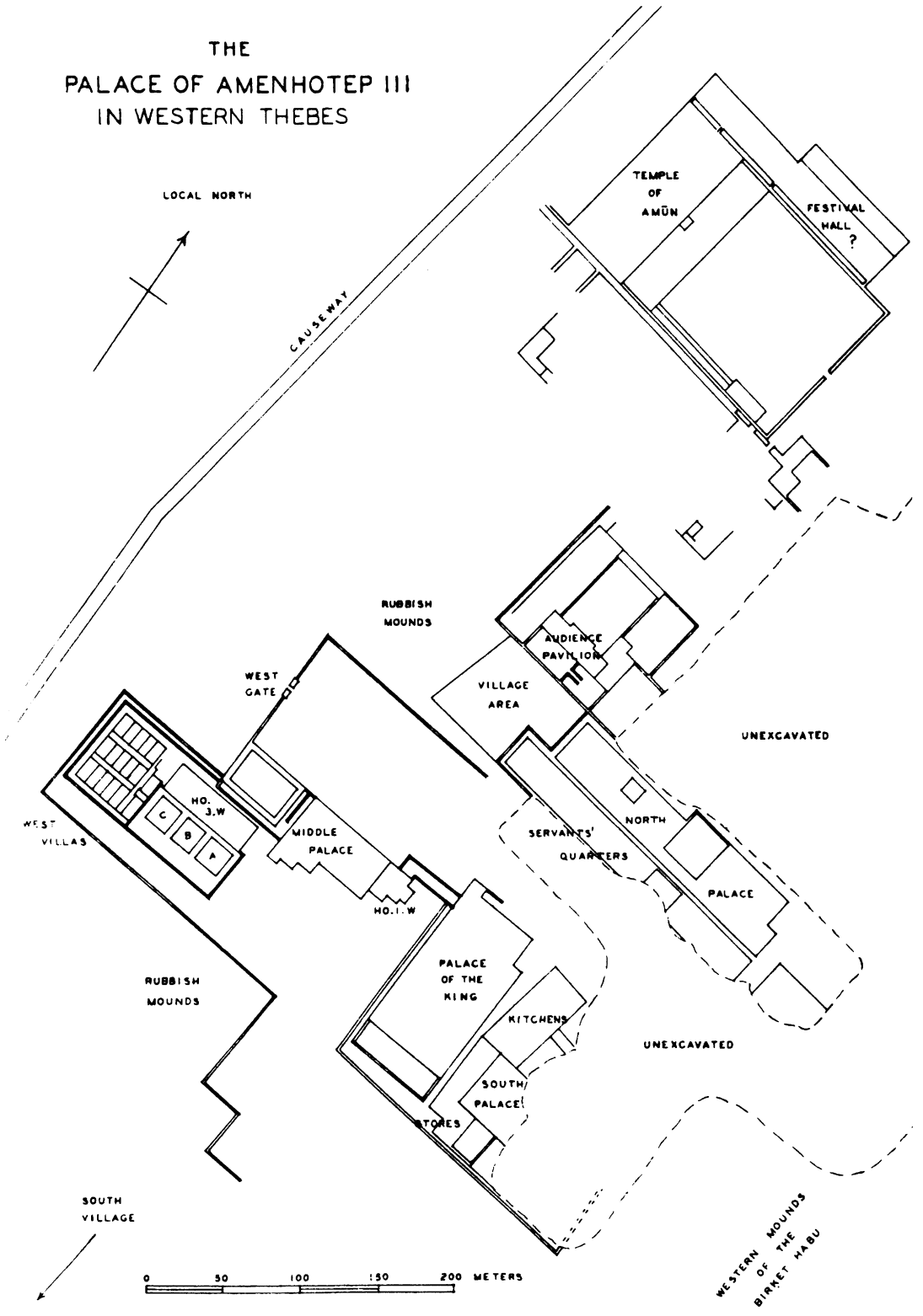


FIG. 1. Plan of Malkata, the palace of Amenhotep III, in western Thebes. The Middle Palace is also called Ho.2.W in the field records. (after Hayes, *JNES* 10, fig. 1; courtesy of the Metropolitan Museum of Art).

Wine ostraca, which comprise twenty per cent of the total corpus (285 examples), provide valuable information on wine production, shipment, and use in New Kingdom Egypt. As on a modern wine label, the ostraca (see Appendix 1) state one or more of the following items:

1. The regnal year that the beverage was presented to the pharaoh, presumably the same year it was produced. Years 30, 34, and 37 stand out in having a large number of examples, but the intervening years of the last decade of Amenhotep III's reign are also well represented.
2. The commodity itself, *irp*, perhaps deriving from the onomatopaeic response to drinking too much or too quickly.
3. Its quality: 'genuine' (Appendix 1 **25** and **27**), 'good' (**8** and **33**), 'very good' (**17**, **29–30**), etc.
4. The purpose or occasion at which it is presented, e.g. the 'lifting up of the year' or the New Year's celebration (**25**) and the *heb-sed* (**2**).
5. The geographic region where the wine was made: the 'Western River', the north-western Nile Delta region, is represented 68 times (e.g. **1**, **5**, **9–10**, **18–21**, and **27**), along with Per-hebyt in the central Delta (**11**), Tjaru (= Sile) in the north-eastern Delta (**29–31**), Memphis (**22**), the western desert oases (**4**, **16**, and **28**), possibly Syria (Kharu) (**32**), and perhaps other areas.
6. The estate or vineyard, including those of Nebmaatre, the prenomen of Amenhotep III, of Amenhotep, or simply of the pharaoh (**1**, **6–7**, **18**, **24**, and **27**), and of the Royal Wife (**3**). Labels ending with 'is-the-Splendour-of-Aten' (**5** and **20–1**) refer to a religious establishment of the pharaoh.
7. The name and/or title of the person contributing the wine: the overseer of the treasury (**13–15**; pl. XIII, 1), overseer of the fortress Thutmose (**32**), the royal scribe Huy (**33**), etc. When estates of a royal personnage or high official are mentioned (including those in **6**), it is not always clear whether the wine is a donation *of* that estate or is actually produced there and comes *from* it.
8. The chief vintner, who can be named, such as Amen[hotep] (**35**), Amenemone (**9–10**), Pa (**27**), *Nh*... (**18**) and Ptahmai (**21**), or go unnamed (**5** and **22**).
9. Rarely, the vessel's volume is included (e.g. **24–5**). Various measures (*hin*, *min*, and *hekat*) are used on the jars, often inconsistently.[9]

The Malkata ostraca were an archaeochemist's dream come true—here were fragments of ancient vessels whose date of manufacture, place of origin, and contents were known. Besides providing an unparalleled analytical touchstone for uninscribed vessels, an independent assessment of the place of origin of the amphoras and what they contained, using sensitive chemical and statistical methods, promises to refine, extend, and perhaps modify the existing understandings about the wine amphoras and related vessels.

[9] Hayes, *JNES* 10, 95.

Analytical corpus

Vessel types, stoppering and sealing

The 35 wine ostraca that were chemically analysed were selected to be broadly representative of the wines delivered to Malkata during the last decade of Amenhotep III's life. All of the major geographic regions, and many of the named estates, officials, and chief vintners, are mentioned in their inscriptions. In addition, jars containing other goods, either believed to be produced locally (meat and beer) or imported ('ale' and *ben*-oil) and relevant to fermented beverage production, were tested.

The pottery vessels from which the ostraca come are almost exclusively amphoras of the well-known 'Canaanite jar' type.[10] The piriform-shaped jar with two handles, a pointed or knobbed base, and a narrow mouth (cf. fig. 2; pl. XIII, 2) derives from a Middle Bronze Syro-Palestinian prototype that soon made its way to Egypt and was produced there.[11] It was well-suited to transporting liquid goods by sea: its curved base was stronger than a flat base and served as a 'third handle' for loading and unloading from ships; its overall shape enabled efficient storage in a ship's hold by intercalating layers of amphoras;[12] and its usual volumetric capacity of 30 litres was close to the maximum that could be handled by a single man. As storage containers, amphoras could be rested upright against a wall or supported in a hole or a special support. Narrow mouths were stoppered and sealed by fashioning wet clay around an inserted reed, leaf, or clay bung and/or pottery sherd and the rim of the amphora (cylindrical type).[13] In some cases, although for none of the Malkata sealings, holes were punched through the sealings or even the vessel sidewalls, which may have served as secondary fermentation locks, and then resealed.[14] The king's cartouches and a shortened version of the ostracon information in Egyptian hieroglyphs, usually mentioning the wine's quality, purpose, geographic or estate origin, were stamped and/or painted on the top and sides of the stopper.[15]

[10] V. R. Grace, 'The Canaanite Jar', in S. S. Weinberg (ed.), *The Aegean and the Near East: Studies Presented to Hetty Goldman on the Occasion of Her Seventy-fifth Birthday* (Locust Valley, NY, 1956), 80–109; B. G. Wood, 'Egyptian Amphorae of the New Kingdom and Ramesside Periods', *Biblical Archaeologist* 5 (1987), 75–83; C. A. Hope, *Pottery of the Egyptian New Kingdom: Three Studies* (Burwood, 1989) (subsequently Hope, *Three Studies*); A. Leonard, Jr., '"Canaanite Jars" and the Late Bronze Age Aegeo-Levantine Wine Trade', in P. E. McGovern et al. (eds), *The Origins and Ancient History of Wine* (Luxembourg, 1995), 233–54.

[11] P. E. McGovern and G. Harbottle, '"Hyksos" Trade Connections between Tell el-Dabʿa (Avaris) and the Levant: A Neutron Activation Study of the Canaanite Jar', in E. Oren (ed.), *The Hyksos: New Historical and Archaeological Perspectives* (University Museum Monograph 96; Philadelphia, 1997), 141–57 (subsequently McGovern and Harbottle, 'Hyksos'). A more detailed monograph on the Syro-Palestinian pottery types found at Tell el-Dabʿa—both imported and locally made—is now in press: P. E. McGovern, *The Foreign Relations of the 'Hyksos': A Neutron Activation Study of the Middle Bronze Age Pottery from Tell el-Dabʿa (Ancient Avaris)* (Österreichische Akademie der Wissenschaften, Vienna). Only the round-shouldered type (fig. 2a) was made of Egyptian clays in large numbers during the New Kingdom (Hope, *Three Studies*, 92 ff), whereas flatter-shouldered varieties and generally lower necked varieties (e.g. fig. 2b–c) were more commonly produced in the Levant.

[12] Compare the Uluburun shipwreck: C. Pulak, 'The Bronze Age Shipwreck at Ulu Burun, Turkey: 1985 Campaign', *AJA* 92 (1988), 1–37, and G. F. Bass et al., 'The Bronze Age Shipwreck at Ulu Burun: 1986 Campaign', *AJA* 93 (1989), 1–29.

[13] Hope, *Malkata Sealings*, 14 f, fig. 8a; Hope, 'Tutʿankhamun Sealings', 93–5, fig. 1.

[14] A. Lucas and J. R. Harris, *Ancient Egyptian Materials and Industries*[4] (London, 1962), 19–20 (subsequently *AEMI*); L. H. Lesko, *King Tut's Wine Cellar* (Berkeley, 1977), 20; Hope, *Malkata Sealings*, 7; cf. Hope, 'Tutʿankhamun Sealings', 135.

[15] Hayes, *JNES* 10, 156–62, fig. 24.FF and GG; Hope, *Malkata Sealings*, 24–5, and Hope, 'Tutʿankhamun Sealings', 96, 132.

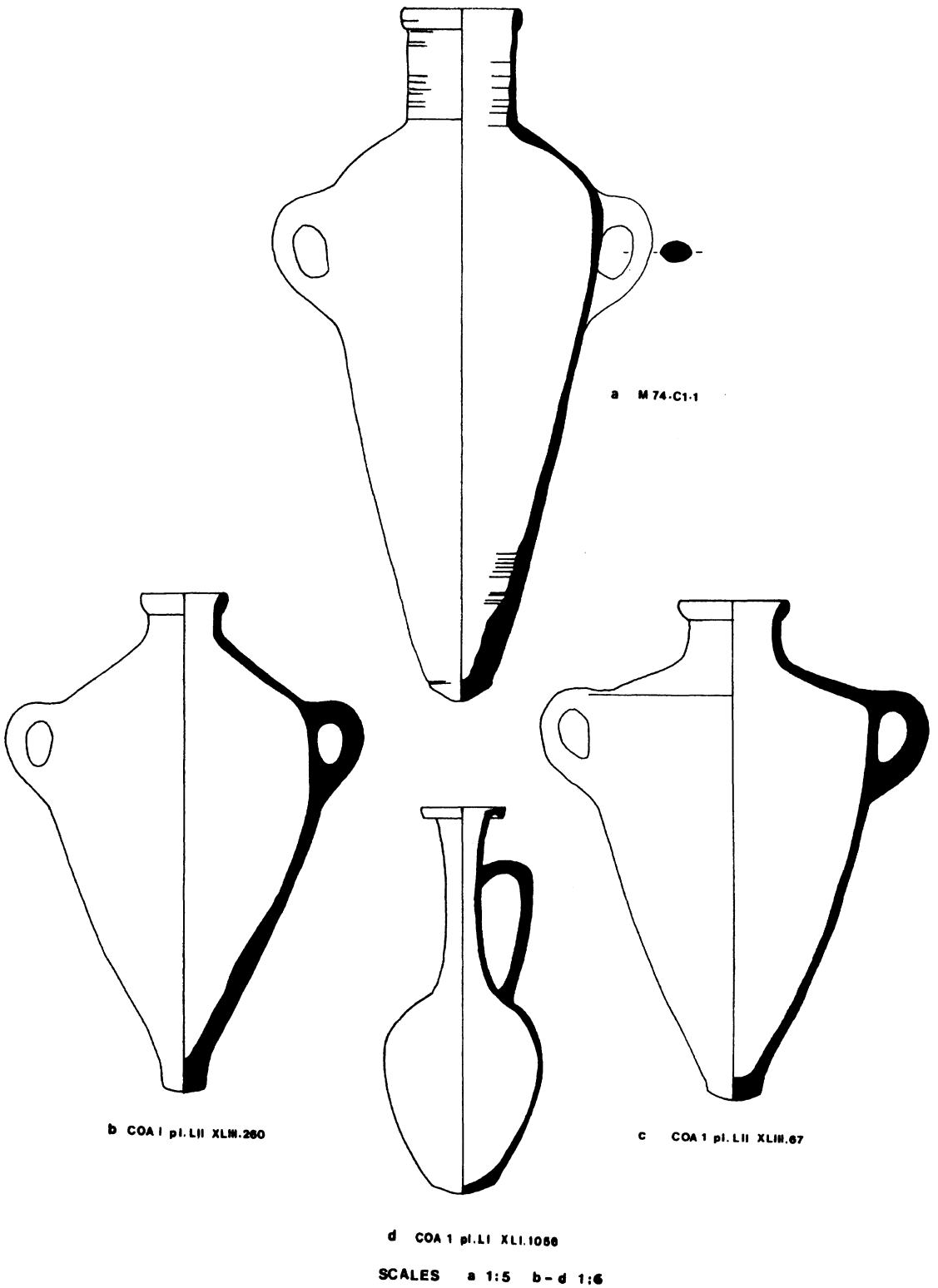


FIG 2. New Kingdom amphora and flask types: (a) high-necked, elongated type with pointed base (University of Pennsylvania Museum expedition no. M74.C1.1); (b) ovoid type with knob base (*City of Akhenaten* I, pl. 52.xliii.260); (c) shouldered type with knob base (ibid., pl. 52.xliii.67); (d) 'Syrian flask' type (ibid., pl. 52.xli.1056) (after Hope, *Malkata Sealings*, fig. 1; courtesy of Aris and Phillips Ltd).

The Malkata amphoras were constructed of hand-formed and wheel-made pieces, which were roughly smoothed on the exterior.[16] Their bases were generally made of a clay slab formed in a mould. Rims were made by folding the mouth to the exterior, thereby creating a rounded bulge that the clay sealing would adhere to better. Handles were added after drying. By contrast, Syro-Palestinian Late Bronze amphoras are both wheel-made and coil-built, with either slab bases or bases that were cut off the wheel and then plugged or closed in the upside-down mode.[17] The Late Bronze II variety (*c.* 1400–1200 BC; fig. 2b–c) is characterized by a knob base, flat shoulders, low neck, and more angular body. The latter features were rarely imitated in Egyptian native clays.[18]

The jars examined in this study were generally not decorated. Ten amphoras were covered with a white slip (Appendix 1 **2**, **8**, **10** and **31–2**), which was sometimes irregularly hand-burnished (**28–30**, **33**, and **35**). Such treatment helps to make the vessels more impervious to leakage and has the additional benefit for wine that less oxygen is available to allow *Acetobacter* bacteria to multiply and convert alcohol to vinegar.[19] Many of the other amphoras in the corpus had a whitish cast on their exterior surfaces, which has sometimes been identified as a slip but is more likely due to salts in the calcareous marl clays (see below) migrating to the surface during the drying process. Painted decoration in the analytical corpus was limited to a red-painted potter's mark (**8**), an X with horizontal lines connecting the upper and lower arms, of uncertain significance. Rarely, Malkata amphoras have multicoloured painted floral and geometric designs.[20]

Another Malkata vessel type used for transporting and storing wine was a one-handled elongated jug, belonging to the class of so-called 'Syrian flasks' (cf. fig. 2d).[21] Hayes[22] assigned the ostraca from the western oases (**4** and **28**) to this type, but his conclusion could not be corroborated because of the small sizes of the sherds. In Tutankhamun's tomb, seven such flasks were recovered, one of which was reported to contain 'dried [wine] lees' and another of which had an intact sealing that was stamped with a wine label.[23] This type is probably not represented in the analytical group.

Fabrics and firing

The exterior subsurface fabric and interior surface of most amphoras was light red or red (Munsell 10R 4–6/8). One specimen (Appendix 1 **21**) had a yellowish ware, and two

[16] Hope, *Three Studies*, 13, 93; see fig. 2a.

[17] P. E. McGovern, 'Ancient Ceramic Technology and Stylistic Change: Contrasting Studies from Southwest and Southeast Asia', in W. D. Kingery (ed.), *Technology and Style* (Ceramics and Civilization 2; Columbus, 1986), 33–52; reprinted, in J. Henderson (ed.), *Scientific Analysis in Archaeology and its Interpretation* (Oxford, 1989), 63–81; W. D. Glanzman and S. J. Fleming, 'Pottery Technology: Fabrication Methods', in P. E. McGovern, *The Late Bronze and Early Iron Ages of Central Transjordan: The Baqʿah Valley Project, 1977–1981* (University Museum Monograph 65; Philadelphia, 1986), 164–77.

[18] Hope, *Three Studies*, 15, 94–5.

[19] J. Farkaš, *Technology and Biochemistry of Wine*, I (New York, 1988), 208–14, 255.

[20] Hope, *Malkata Sealings*, 70.

[21] See R. Amiran, *Ancient Pottery of the Holy Land; From Its Beginnings in the Neolithic Period to the End of the Iron Age* (New Brunswick, NJ, 1970), 167, 170–1.

[22] *JNES* 10, 89.

[23] R. Holthoer, 'The Pottery', in el-Khouli et al., *Stone Vessels, Pottery and Sealings from the Tomb of Tutʿankhamun*, 64–7 (subsequently Holthoer, 'Tutʿankhamun Pottery'); Hope, 'Tutʿankhamun Sealings', 115–16.

ostraca (**4** and **16**) were whitish in colouration. A number of examples had grey cores resulting from incomplete oxidation of elemental carbon, some of which derived from small amounts of organic temper added to the clay. Although a proper petrographic study of the Malkata wine jars is yet to be carried out,[24] previous investigators report that the fabric, designated Marl D,[25] contains large amounts of limestone temper, in addition to quartz, mica, and feldspar. Hope[26] suggests a firing temperature range of 800–850°C, based on refiring experiments. Carbonates burn out to a minimal extent and calcareous clays become relatively dense and vitrified in this range. Egyptian calcareous marls are well-suited for amphoras used in the transport and storage of food stuffs and other materials, because of their strength and non-permeability, in contrast to Nile alluvial wares.[27]

Interior residues

Six wine amphoras had red deposits of varying thicknesses on their interiors (Appendix 1 **3**, **9**, **13**, **15**, **33**, and **35**; also see pl. XIII, 1). Less commonly, the colouration of such a deposit was dark brown (**11**, **23**, and **25**) or black (**34**), the latter having a shiny, resinous character. A perusal of the collection of ostraca as a whole indicates that red and brown interior residues are more prevalent for wine than other foods or beverages. Incense (*sntr*) and resin (*sft*) amphoras also have dark brown or black deposits on their interiors.[28] No evidence was found of deliberate sealing of vessels with a resin or other material.[29] Occasional whitish patches, probably secondary calcite accumulations, and darkish, irregular modern organic growths were also noted.

Ten meat amphoras or wider-mouthed jars (Appendix 1 **38–48**), which comprise the highest percentage of ostraca (375 out of 1400—27%), were probably made locally, because of the fact that the donors were exclusively local palace or Theban officials.[30] Three additional New Kingdom ostraca, two from the Valley of the Kings in western Thebes and one from the workmen's village of Deir el-Medineh (Appendix 2), were chosen for analysis because their fabric types had been identified as Marl D, possibly of local origin. Two other early Eighteenth Dynasty Theban jar ostraca from the Embalmer's Cache (pit 1017) of the Sankhkare cemetery were designated as Marl C, and an early Eighteenth Dynasty canopic jar of Marl B and a Middle Kingdom tall cylindrical jar of Marl A2 from tombs in the hills of the Asasif and Sheikh Abd el-Qurneh were thought to be sufficiently unique to have been produced locally.[31] *In toto*, the meat and additional Theban ostraca and early Eighteenth Dynasty pottery from Thebes were chosen to

[24] P. W. Nicholson has sherds from the same ostraca that have been analysed by NAA, and is planning such a study.

[25] Egyptian pottery is classified macroscopically and sub-microscopically (up to 25× magnification) according to the so-called Vienna System (H.-Å. Nordström, 'Ton (clay)', *LÄ* VI, 630–4; H.-Å. Nordström and J. Bourriau, 'Ceramic Technology: Clays and Fabrics', in Do. Arnold and J. Bourriau (eds), *An Introduction to Ancient Egyptian Pottery* (Mainz, 1993), 143–90 (subsequently Nordström and Bourriau, 'Ceramic Technology'); cf. Hope, *Malkata Sealings*, 66–9, particularly fabric BaI.

[26] *Malkata Sealings*, 67.

[27] Hope, *Three Studies*, 98, n. 13.

[28] Hayes, *JNES* 10, 95.

[29] Cf. Hayes, *JNES* 10, 96; *AEMI*[4], 19–20; Hope, *Three Studies*, 98, n. 14.

[30] Hayes, *JNES* 10, 91–2.

[31] Dorothea Arnold, personal communication.

provide a good chemical reference group for Theban New Kingdom pottery, since samples of the locally available modern clays are yet to be collected and tested. As will be seen in what follows, the chemical composition of the local Theban clay is critical in determining the origin(s) of the wine jars.

One ostracon (**37**) of a large group (298 examples) and possibly a second (**28**) were said to contain *srmt*, either 'ale' (to be distinguished from everyday 'beer', *ḥnqt*)[32] or a solid material, deriving from dates[33] or other materials used in barley beermaking.[34] *Ben*-oil (*bꜣq*), which is generally understood to refer to the seed oil of the moringa tree,[35] occurs on two ostraca (**32** and **36**).

Archaeochemical methods and results

The physico-chemical method of Neutron Activation Analysis (NAA) has been extensively employed in pottery provenance studies, because of its sensitivity and precision in measuring as many as 35 elements, including rare earths which often characterize a clay source, and because it requires very small samples (50–200 mg) that are non-destructively analysed. The chemical composition of the 54 ostraca, detailed in Appendices 1–2 and in Tables 1–5, was determined by NAA at the University of Missouri Research Reactor.[36]

Samples were prepared by scraping the surface with a sapphire tool until the interior fabric was exposed. After soaking in deionized water and crushing the specimens to a fine powder using an agate mortar and pestle, the samples were oven-dried at 85°C. Two portions of about 75–100 mg and 200 mg were subjected to short and long irradiations respectively. The resultant gamma ray data was then processed, incorporating decay corrections, spectrum analyses, and standards, yielding concentrations of 30 elements for each specimen (Tables 1–5).

Relating the chemical composition of a particular ancient pottery sample to a given clay source, thereby 'fingerprinting' the pottery and its presumed place of manufacture, is based on what has become known as the Provenience Postulate,[37] in which it is assumed that the chemical variation within a given clay source is less than that between different sources. The inclusions in the Malkata pottery, whether deriving from the original clay or added as temper by the potter, are relatively 'pure' (e.g. quartz, calcite, and organic materials) and have a diluent effect on the chemical composition of an ancient sample which is spread across the range of elements.

[32] Hayes, *JNES* 10, 90; Leahy, *Malkata Inscriptions*, 5–13.

[33] W. Helck, *Materialen zur Wirtschaftsgeschichte des Neuen Reiches*, IV–V (Akademie der Wissenschaften und der Literatur, Abhandlungen des Geistes- und Sozialwissenschaftlichen Klasse; Mainz, 1963–4), 691–2 (495–6) and 792–3 (184–5).

[34] See Leahy, *Malkata Inscriptions*, 5–6, n. 9; D. Samuel, 'Archaeology of Ancient Egyptian Beer', *Journal of the American Society of Brewing Chemists* 54 (1996), 3–12.

[35] Hayes, *JNES* 10, 93, and Leahy, *Malkata Inscriptions*, 17–18; cf. L. E. Stager, 'The Firstfruits of Civilization', in J. N. Tubb (ed.), *Palestine in the Bronze and Iron Ages* (London, 1985), 174–5, supporting the older translation, 'olive oil' (subsequently Stager, 'Firstfruits').

[36] For analytical procedures, see M. D. Glascock, 'Neutron Activation Analysis', in H. Neff (ed.), *Chemical Characterization of Ceramic Pastes in Archaeology* (Madison, 1992), 11–26.

[37] P. C. Weigand et al., 'Turquoise Sources and Source Analysis: Mesoamerica and the Southwestern U.S.A.', in T. K. Earle and J. E. Ericson (eds), *Exchange Systems in Prehistory* (New York, 1977), 15–34.

The author is presently involved in a large NAA study of Middle Bronze Age pottery from the Levant, including 578 pottery and clay samples from the key site of Tell el-Dabʿa, the ancient Hyksos capital of Avaris, in the north-eastern Nile Delta.[38] To date, 119 pottery and clay samples have been tested from sites in Middle and Upper Egypt, including Kahun and Dahshur near Lisht, Tell el-Amarna, and Abydos, which range in date from the Old to the New Kingdom. An additional 760 pottery and clay samples from 55 coastal and inland sites of Syria, Lebanon, Jordan, and Israel, including Ras Shamra (ancient Ugarit), Tell Kazel, Hama, Byblos, Sidon, Kamid el-Loz, Megiddo, Tel Aphek, Jaffa, Ashkelon, Tell el-ʿAjjul, Tell Beit Mirsim, Beth Shan, Pella, Jericho, Tell el-Fukhar, the Baqʿah Valley of Transjordan, and Bab el-Dhraʿ, have also been analysed. Other projects,[39] accounting for 1208 pottery and clay samples from 79 more Egyptian and Levantine sites, complete the databank for this region.

The clays which have thus far been analysed date from the Lower Cretaceous Period to recent times and derive from deposits throughout the Levant and Egypt. Egyptian alluvial and marl clays, red loess clays of the southern Palestinian coastal region, yellow limestone-derived clays of the Palestinian hill country, Transjordanian smectites and kaolin clays, and other clay sources are well represented in the NAA databank. The Old World databank, altogether 5716 samples, has excellent temporal and spatial coverage of other regions of the Near East and Mediterranean, including the Sudan, Greece, Iraq, Iran, and parts of Turkey. This wide coverage, coupled with large numbers of samples for locally defined groups, enable powerful statistical techniques to be applied in determining the archaeological origin(s) of the Malkata amphoras.

A range of univariate and multivariate algorithms—means and standard deviations, and correlational, clustering, and principal components analysis of a range of elements—are used to define local chemical groups of ancient pottery, with widely divergent samples (outliers) being excluded. Archaeological and geological criteria are important in refining and testing these groups, whether well-dated pottery types, clays from specific geochemical regimes, clay beds within a single deposit, etc. This approach is essential when an ancient clay source has been totally exploited or systematic clay sampling has not yet been carried out in a region.

Clay sources of the Malkata jars according to Neutron Activation Analysis

The Old World databank was searched for the closest chemical 'matches' to the 35 Malkata wine ostraca in mean Euclidean distance (MED) space (defined as the square root of the mean of the sum of the squares of the differences between the log elemental concentrations of any given pair of samples). Although correlational effects are excluded from this calculation, excellent results can be obtained with the fifteen elements—sodium (Na), potassium (K), caesium (Cs), rubidium (Rb), barium (Ba), scandium (Sc), europium (Eu), thorium (Th), hafnium (Hf), manganese (Mn), cobalt (Co), chromium (Cr), iron (Fe), samarium (Sm), and ytterbium (Yb), as the oxides—because the variance in the MED approaches zero as the inverse of the number of

[38] M. Bietak, *Avaris and Piramesse: Archaeological Exploration in the Eastern Delta*[2] (London, 1986), 'Egypt and Canaan during the Middle Bronze Age', *BASOR* 281 (1991), 27–72, and *Avaris, The Capital of the Hyksos* (London, 1996); see also n. 11 above and P. E. McGovern et al., 'The Archaeological Origin and Significance of the Dolphin Vase as Determined by Neutron Activation Analysis', *BASOR* 296 (1994), 31–43.

[39] E.g. M. K. Kaplan, *The Origin and Distribution of Tell el Yahudiyeh Ware* (SMA 62; Gothenburg, 1980); D. Brooks et al., 'Biblical Studies through Activation Analysis of Ancient Pottery', in C. W. Beck (ed.), *Archaeological Chemistry* (Advances in Chemistry 138; Washington, DC, 1974), 48–80.

variables. An MED of less than 0.08 has been empirically determined to be indicative of group membership and a chemical 'match'.

Except for four examples, all the wine ostraca (Table 1, NAA nos. PMG228, 248–57, and 260–78, and 332–3) are closest to one another in an MED range from 0.02 to 0.08, averaging 0.035 for the next nearest specimen and with 26 samples being within 0.02–0.04 of one another. No other samples in the databank, representing other geographic regions of Egypt and the Eastern Mediterranean, were as close as those from Malkata itself. Similarly, the ten meat ostraca (PMG335–9 and 341–5), two probable 'ale' specimens (PMG326 and 334), and seven additional Theban samples (Table 2, PMG327–9, PMG447–8, PMG450, and PMG455; see pp. 76–7) belonged to the same group, which is characterised by very small group standard deviations (5–15% of the mean) for individual elements (except the alkalis and alkaline earths, nickel, antimony, arsenic, and strontium). Marl D, the fabric that has been identified as most commonly used for amphoras in New Kingdom Egypt on the basis of macroscopic and low-power microscopic criteria (above), thus has a firm chemical basis. Moreover, the uniqueness of some samples in this group and the likelihood that the Malkata amphoras were specifically made to 'rebottle' special goods for the *heb-sed*, as argued in the concluding section of the paper, are strong indicators that the ancient clay which was exploited was located in the Theban area.

It is common for the elements in clays and minerals to covary with one another. For example, the high correlation ($r>0.99$) of iron and scandium, both trivalent ions of about equal size, in nature is well known. Univariate statistics can be very misleading if such relationships go unrecognised.

If the variance–covariance matrix for many elements of a presumed local group is calculated, a new set of standardised orthogonal coordinates (eigenvectors) can be defined in multidimensional Mahalanobis space that takes advantage of elemental correlations.[40] For the statistical calculations, the oxide data are converted to logarithms, since many chemical elements appear to be lognormally distributed in nature, and are also standardised by this procedure. The Mahalanobis distance of a given sample from the origin or centroid of the group is directly related to the probability of the group membership of that sample, assuming a multivariate normal distribution.[41] Using fifteen elements in the calculation, it has been estimated by comparisons of the large Brookhaven New World pottery databank (about 10,000 samples) against the Old World databank (about 5000 samples) that the accidental assignment of a sample at a Mahalanobis distance probability (MDP) of 1% is nil for these two archaeologically and geochemically distinct regions.[42] Within a more circumscribed region, such as Egypt and the Eastern Mediterranean, where the same or related geological processes have been at work, this unique chemical 'fingerprinting' is not assured, but with high correlations between many elements, such as is characteristic of Levantine clays and pottery, it is possible to achieve extremely good results. An MDP above 5% for a sample tested against a group with a high sample number to variate ratio is a strong guarantee that it belongs to that group.

Using the same fifteen elements used to determine the MED and not correcting for dilution or concentration effects, the average Mahalanobis distance of the presumed Theban local marl group (Tables 1 and 2) was calculated to be 72.8%, well above the 5% cut-off point. Indeed, 27 of the presumed local Theban samples exceeded 85%, and all other samples in the Old World databank, totalling 5716 examples, had a 0% MDP of belonging to the group. It is virtually certain therefore that the Malkata and additional Theban samples were made from the same marl clay, probably of local origin.

Of the four wine ostraca that did not belong to the local Theban group, one specimen (Appendix 1 **8**; Table 5, PMG259) is of uncertain origin but closest to several samples in the local

[40] G. Harbottle, 'Efficiencies and Error-Rates of Euclidean and Mahalanobis Searches in Hypergeometries of Archaeological Ceramic Compositions', in E. Pernicka and G. A. Wagner (eds), *Archaeometry* 90 (Basel, 1991), 413–24 (hereafter Harbottle, 'Efficiencies').

[41] E. V. Sayre, 'Brookhaven Procedures for Statistical Analyses of Multivariate Archaeometric Data', unpublished Brookhaven National Laboratory Report BNL-23128 (Upton, NY, 1975).

[42] Harbottle, 'Efficiencies', 413–24.

group; it is too far removed in MED space (0.12), however, to make a positive assignment. A second specimen (**34**; Table 3, PMG253), which refers to the enigmatic 'child of the nursery *Kmi*', is within 0.04–0.08 MED of numerous Nile alluvial specimens in the databank, and has a 14.9% MDP of belonging to the large Tell el-Dabʿa Nile alluvial clay group (184 samples).

The two remaining non-local specimens (**4** and **16**; Table 4, PMG331 and PMG258 respectively) have labels stating that they are from a western oasis. They are also characterised by whitish fabrics. The two samples, whose chemical compositions diverge significantly from one another and from other Egyptian marls, are not 'matched' by any samples in the Old World databank. Since chemical analyses of local pottery and clays from the oases are quite limited,[43] it is possible that they were made of as yet unsampled and untested clays from this region.

Because *ben*-oil was apparently added to one of the wine amphoras (Appendix 1 **32**), the clay origin of an amphora containing this oil (**36**; Table 5, PMG340) was of interest. The vessel, whose label states that it is from the mayor of She-Sobek (probably the Fayyum), does not 'match' the locally well-defined marl clay (Marl C) which outcrops in the vicinity[44] nor any other Egyptian clay or pottery sample in the NAA databank.

Organic contents of the jars

Nine wine ostraca and one 'ale' ostracon, denoted as organic samples nos. 1–10 in Appendix 1 (see **9**, **11**, **23**, **25–6**, **32–5**, and **37**) were tested for organic compounds, specifically tartrate/tartaric acid (characteristic of grape products, including wine), oxalate (often deriving from barley and deposited as the insoluble calcium salt in vessels used for barley beer), and tree resins. Our archaeochemical laboratory employs complementary analytical techniques—infrared spectrometry (IR), liquid chromatography, and wet chemical analyses—to determine the presence/absence of these and other organics.[45]

Residue scrapings and/or extracts of small sherds from each ostracon were first analysed by diffuse-reflectance Fourier-transform IR spectrometry. This versatile technique has the advantage that very little material is required (1–10 mg) and, unlike transmission IR spectrometry, an optically transparent KBr (potassium bromide wafer) does not have to be prepared.

Organic samples 5 (Appendix 1 **34**) and 6 (**23**) had shiny black and dark brown residues on their interiors, respectively. Both were extracted with ethanol using an ultrasonicator (two 20-min periods), evaporating to dryness, and testing the extracts by diffuse-reflectance Fourier-transform IR spectrometry.[46] Organics were very likely contributed by the residue itself, which gave positive results when tested without extracting, and from material that had accumulated in the pores of the pottery fabric. On fig. 3, the maxima at 1710–1725 cm^{-1}, 1450–1460 cm^{-1}, and 1240–1255 cm^{-1} are definitive for the carbonyl and carboxylic acid groups of tartaric acid, as a comparison with the spectrum of L-(+) tartaric acid, the naturally occurring isomer (fig. 4), shows. A minor amount of tartrate, probably in the form of the calcium salt, is indicated by the medium intensity bands in the 1550–1650 cm^{-1} range. The broad absorption band centred at about 3350 cm^{-1}

[43] Compare S. K. Tobia and E. V. Sayre, 'An Analytical Comparison of Various Egyptian Soils, Clays, Shales, and Some Ancient Pottery by Neutron Activation', in A. Bashay (ed.), *Recent Advances in Science and Technology of Materials*, III (New York, 1974), 118–21, tables IV and V (subsequently Tobia and Sayre, 'Analytical Comparison'); also see R. Said, *The Geology of Egypt* (New York, 1962), 67–86, and M. Hermina, 'The Surroundings of Kharga, Dakhla and Farafra Oases', in R. Said (ed.), *The Geology of Egypt* (Rotterdam, 1990), 259–92.

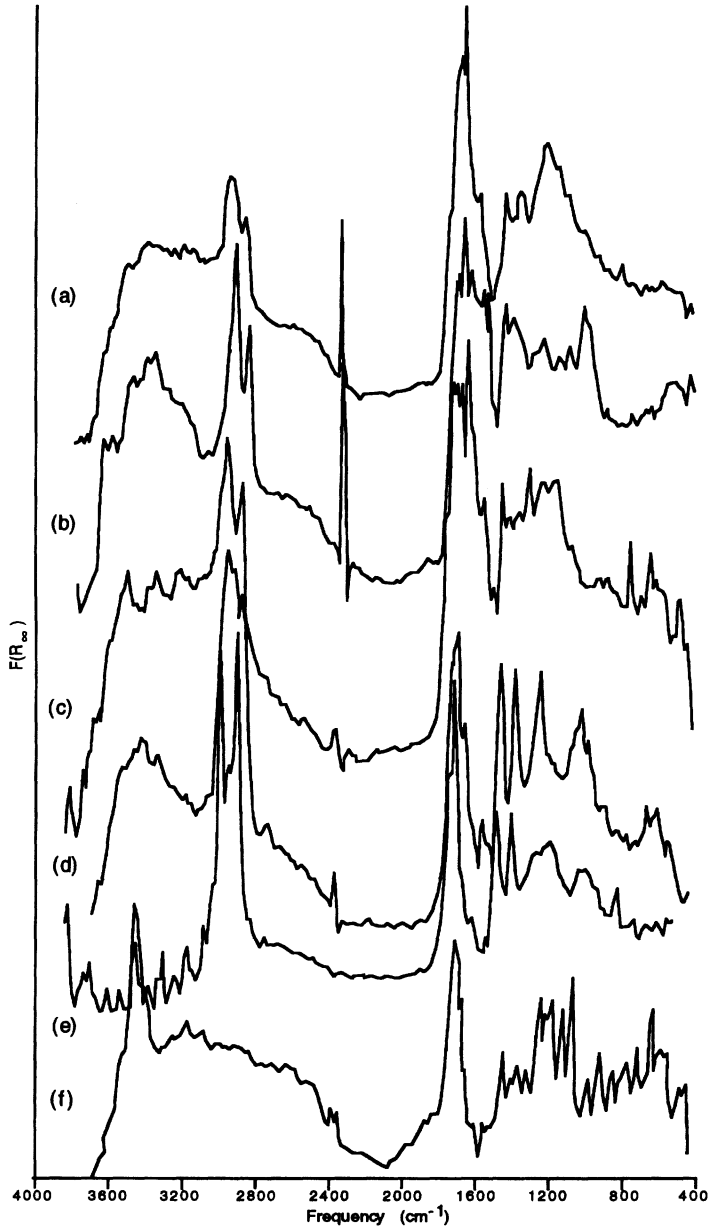
[44] McGovern et al., *BASOR* 296, 40–1; Tobia and Sayre, 'Analytical Comparison', 108–12, table II.

[45] P. E. McGovern and R. H. Michel, 'The Analytical and Archaeological Challenge of Detecting Ancient Wine: Two Case Studies from the Ancient Near East', in McGovern et al. (eds), *The Origins and Ancient History of Wine*, 57–65 (subsequently McGovern and Michel, 'Two Case Studies'); R. H. Michel et al., 'The First Wine and Beer: Chemical Detection of Ancient Fermented Beverages', *Analytical Chemistry* 65 (1993), 408A–13A; R. H. Michel et al., 'Chemical Evidence for Ancient Beer', *Nature* 360 (1992), 24.

[46] A Nicolet 5DXB instrument, with a 20DX data processor, was used in taking measurements at 2 cm^{-1} resolution. Spectra were then deresolved at 16 cm^{-1} for library storage, searches, and printing.

results from hydroxyls of tartaric acid (fig. 3) and water of hydration. C–H bonds account for the intense peak around 2900 cm^{-1}, due to tartaric acid/tartrate and other organics.

The possibility of the other organic compounds having been derived from a tree resin, which was more definitively supported by the liquid chromatographic data presented immediately below, is evident from the IR spectra for myrrh (genus *Commiphora* of the Burseraceae family) and



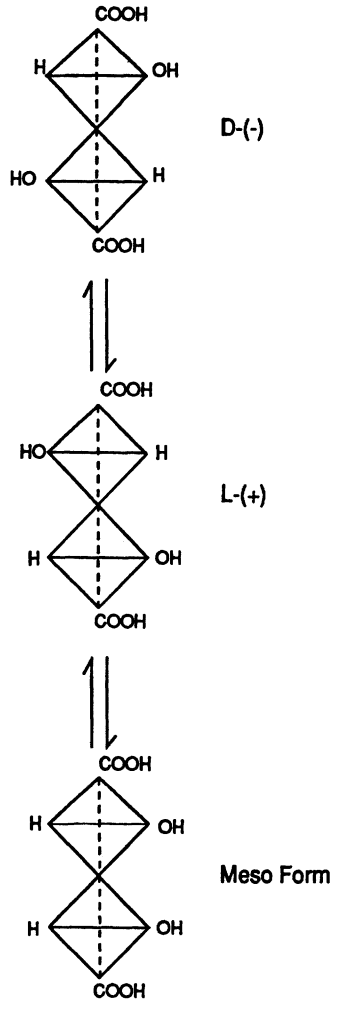


FIG 4. Stereoisomers of tartaric acid.

FIG 3. Diffuse-reflectance Fourier transform infrared spectra of a. organic sample 5 (Appendix 1 **34**); b. organic sample 6 (**23**); c. red lustrous spindle bottle (Royal Ontario Museum, Egyptian Dept. no. 910.85.15 (B.969)); d. Chian terebinth resin (sample from amphora KW 144, from the Uluburun shipwreck); e. commercial myrrh (uncertain origin); and f. L-(+) tartaric acid.

Chian turpentine or terebinth resin (*Pistacia atlantica* Desf.) from an amphora on the Uluburun shipwreck (sample from amphora KW 144).[47] The carbonyl peaks at 1720–1740 cm^{-1}, unfortunately, overlap with those of tartaric acid, but the intense maxima at 1460 cm^{-1}, 1380 cm^{-1}, and 1250 cm^{-1}, as well as other bands in the 'fingerprint' region from 1550 to 800 cm^{-1}, are sufficiently distinctive to posit the presence of a tree resin. Unexplained or higher intensity peaks on the spectra for Malkata organic samples 5 and 6, as contrasted with that of L-(+) tartaric acid, are very likely due to this tree resin. The IR spectrum of a dark brown deposit from a liquid that had leaked out and congealed on the surface of a sealed red lustrous spindle bottle[48] from New Kingdom Egypt is very similar to those of organic samples 5 and 6. This vessel type probably influenced the development of the more bulbous 'Syrian flask', which may have been used to transport and store some of the wine at Malkata.

An instructive exercise to substantiate that wine and a tree resin were mixed together in the Malkata wine amphoras, such as organic samples 5 and 6, is to make up hypothetical IR spectra using known constituents. On fig. 5, a mixture of 40% myrrh, 40% tartaric acid, and 20% calcium tartrate provides an excellent match for 'unknown' organic samples 5 and 6.

Six other organic samples from Malkata wine amphoras gave IR spectra in which calcium tartrate clearly exceeded tartaric acid. The IR spectra for organic samples 2 (Appendix 1 **26**) and 7 (**11**) are most definitive (see fig. 6). the sharp, intense peaks at about 1610 cm^{-1} and 1585 cm^{-1} for these two samples and calcium tartrate, which are due to the carboxylate ion, should be especially noted. Many other absorption bands (e.g. 1385, 1330, 1275, 1150, 1060, 1005, 955, and 815 cm^{-1}) in the 'fingerprint' region match up exactly and have similar shapes and intensities for the three spectra. Although a broad hydroxyl band is present, hydrocarbon peaks at around 2900 cm^{-1} are lacking on each. Organic sample 7 had a thick, dark brownish residue on its interior, whereas the deposit on organic sample 2 was thin and reddish.

Two sharp peaks in the 1580 to 1625 cm^{-1} range (fig. 7) are characteristic of the other organic samples that yielded evidence of calcium tartrate, viz. 1 (Appendix 1 **35**), 3 (**32**), 4 (**25**), 7 (**11**), and 8 (**35**). Peaks in the 'fingerprint' region above 1250 cm^{-1} also correspond to those of calcium tartrate. Other peaks below 1250 cm^{-1} are hidden under the wide absorption band (maximum of 1030 cm^{-1}) resulting from clay minerals in the residue scrapings. When relatively more clay is present, another band in the 1350 to 1500 cm^{-1} range begins to mask tartrate peaks here (compare the spectrum for organic sample 8—fig. 7). A hypothetical mixture of 70% calcium tartrate and 30% pottery fabric (from ostracon **24** made of probable Theban marl clay according to the NAA results) gave an IR spectrum that is closest to that of sample 8, with distinct carboxylate peaks around 1600 cm^{-1} (fig. 8). All of these samples had reddish or brownish residues of varying thicknesses on their interiors. Because of its small size, organic sample 9 (**39**) was not analysed by IR spectrometry.

Extracts of the eight samples that tested positive for tartaric acid/tartrate, in addition to organic sample 9, were then analysed by liquid chromatography.[49] The ultraviolet (UV) spectra of organic material, which came off the column at about 1.1, 1.3 and 1.6 min (fig. 9) substantiated the groupings, already established by IR, at a high probability level. Thus, L-(+) tartaric acid predominates in organic samples 5 and 6 (fig. 10), whereas the other Malkata samples have absorption spectra typical of calcium tartrate.

[47] See Pulak, *AJA* 92, 11.

[48] The vessel (inventory no. 910.85.15 (B.969)) was sampled by R. Shaw of the Royal Ontario Museum, Egyptian Department. It is illustrated and described in D. M. Robinson and C. G. Harcum, *A Catalogue of the Greek Vases in the Royal Ontario Museum of Archaeology, Toronto*, I (Toronto, 1930), 18, pl. vi.72–3.

[49] Samples were run at ambient temperature on a high-performance liquid chromatograph, Hewlett-Packard HP-1090, with extensive software for data handling and manipulation. Methanol extracts were passed through a 25 cm × 4.6 mm silica column at a flow rate of 2.0 ml/min, with methanol as the solvent. For samples composed primarily of calcium tartrate, as shown by the IR results, acidified samples were first prepared and dried. Ultraviolet absorptions were measured over a range from 200 to 400 nm, using detectors that were most sensitive at 210, 254, and 260 nm. Samples volumes ranged from 2.0 to 10.0 µl, depending on the concentration of organics in the unknown.

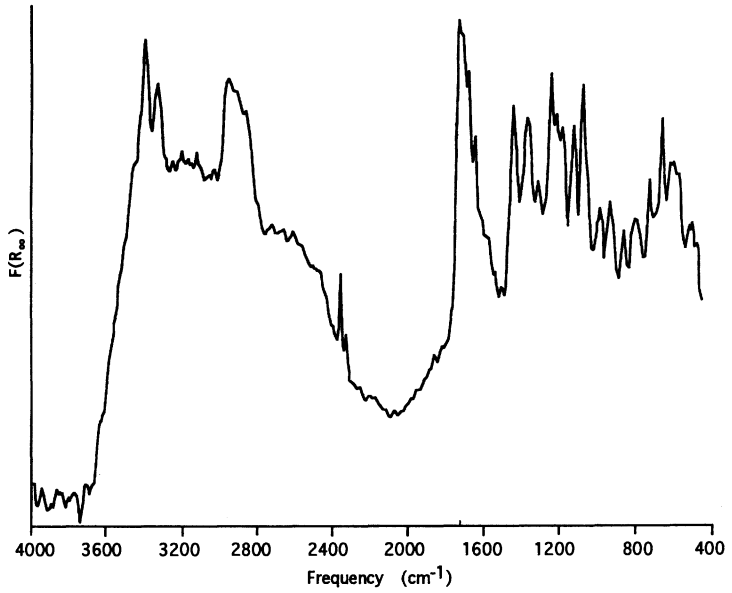


FIG 5. Diffuse-reflectance Fourier transform infrared spectra of a hypothetical mixture of 40% modern myrrh, 40% L-(+) tartaric acid, and 20% synthetic calcium tartrate.

The chromatographic evidence was more determinative than that of IR in establishing the identity of the tree resin additive to the wine. The 1.6 min spectra of organic samples 5 and 6 (fig. 11), for example, are marked by strong absorptions at 250 nm, which correlate with that of myrrh. The other Malkata samples have spectra that are most similar to that of Chios turpentine or terebinth resin (*Pistacia atlantica* Desf.). Further study, however, is needed for definitive identifications of the tree resins present in the Malkata wines.

Finally, a third analytical technique confirmed the presence of tartaric acid/tartrate, viz. a specific, wet-chemical test[50] in which β,β'-dinaphthol and concentrated sulphuric acid are used to convert tartaric acid to a compound that exhibits green fluorescence under UV light. All of the wine ostraca samples gave a positive result except organic sample 9. The liquid chromatographic data for the latter sample, in which organic material came off at 1.6–1.7 min but not at 1.3 min, indicates that it was largely comprised of terebinth resin.

A residue scraping from one of the 'ale' ostraca (organic sample 10; Appendix 1 **37**) was also tested by a specific, wet-chemical test for calcium oxalate. This compound is a principal component of 'beerstone', which settles out at the bottom and along the sides of barley beer processing and storage vesels.[51] The Feigl test,[52] in which oxalate is reduced in an acidic medium to glyoxalic acid, followed by reaction with phenylhydrazine and hydrogen peroxide, to give a distinctive pinkish red colour, was positive for organic sample 10.

The analytical results for ostraca which stated that they contained some other material besides wine and tree resin were scrutinised. No evidence of honey was found for organic sample 8 (**35**), and unless *ben*-oil is similar in composition to the tree resins in our reference group, organic sample 3 (**32**) did not differ in any significant way from the other tartaric acid/tartrate and tree resin samples.

[50] F. Feigl, *Spot Tests in Organic Applications* (New York, 1954), 384–5.
[51] Michel et al., *Analytical Chemistry* 65, 412A, and *Nature* 360, 24.
[52] Feigl, *Spot Tests*, 384–5.

Discussion and conclusions

The results of the three independent chemical analyses of organic samples 1–8 strongly support the presence of tartaric acid and/or its salt, calcium tartrate, combined with a tree resin (also including organic sample 9). Since tartaric acid/tartrate occurs in large amounts in nature only in grapes, the organic contents of the amphoras is in accord with the commodity, wine, stated on their labels.

Under normal conditions and at room temperature, grape juice easily and quickly ferments to wine. Because of slow pressing methods in antiquity and high temperatures in the Middle East, fermentation had probably begun before a jar was filled.[53] The addition of terbinth resin, myrrh, and other tree resins to wine, in the fashion of modern *retsina* (which now contains either pine[54] or sandarac resin),[55] served in part to disturb and inhibit the growth of bacteria (*Acetobacter*) that convert wine to vinegar, besides

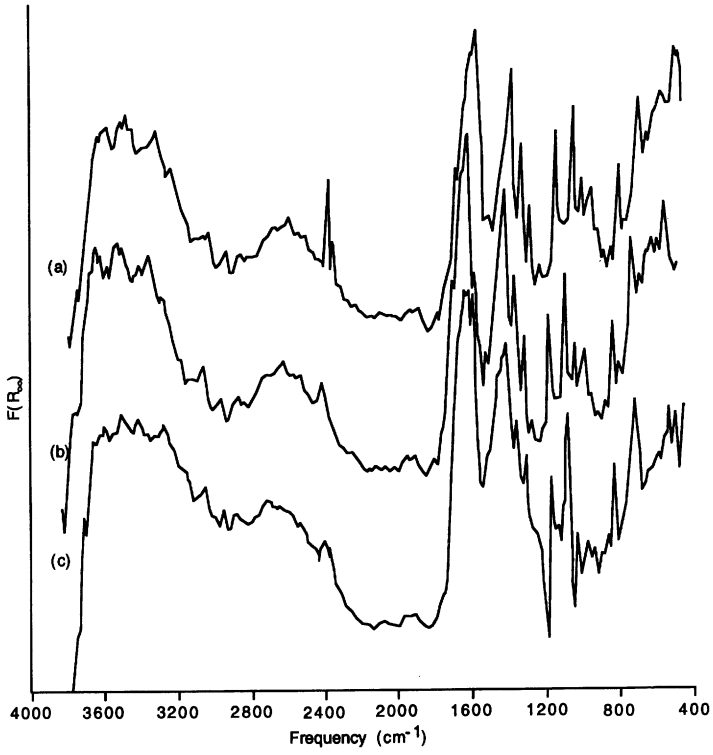


FIG 6. Diffuse-reflectance Fourier transform infrared spectra of a. organic sample 2 (Appendix 1 **26**); b. organic sample 7 (**11**); c. synthetic calcium tartrate.

[53] *AEMI*[4], 16–18.

[54] An ancient pine-resinated wine of fifth century BC Italy is chemically characterized by E. Hostetter et al., 'A Bronze Situla from Tomb 128, Valle Trebba: Chemical Evidence of Resinated Wine at Spina', *Studi Etruschi* 59 (1994), 211–25.

[55] For this resin, which derives from a north-western African tree (*Tetraclinis articulata*), see *AEMI*[4], 321, 358–9.

masking any offensiveness of taste and smell.[56] Wine and tree resins figure importantly in the Egyptian pharmacopeia, since both have anti-microbial properties.[57] Ancient Egyptians need not have had a scientific understanding of the effects of these natural products to appreciate their beneficial properties. Developing a *medicamentum* or preservative to prevent wine from spoiling must have been an important priority even before Pliny the Elder[58] and Columella[59] wrote about it in the first century AD.

Terebinth resin, which is best supported by the chemical evidence as the tree resin added to the majority of the Malkata wine jars, has been described as the 'queen of

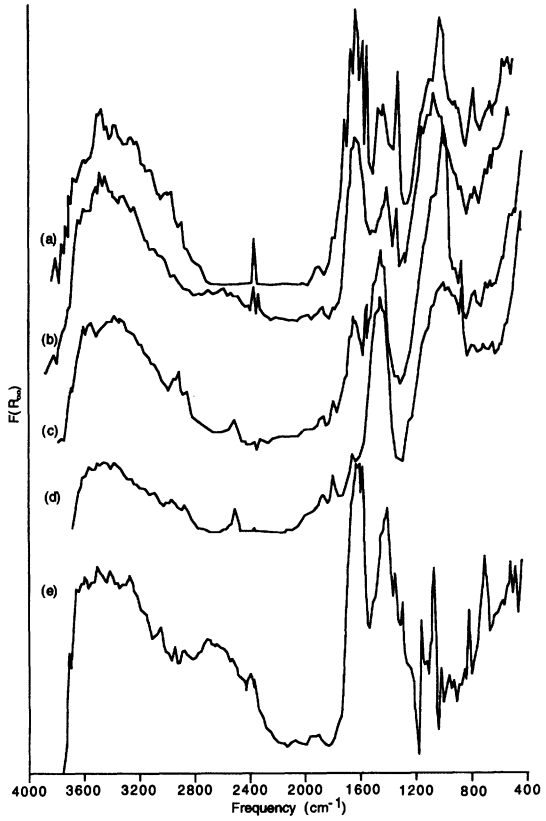


FIG 7. Diffuse-reflectance Fourier transform infrared spectra of a. organic sample 3 (Appendix 1 **32**); b. organic sample 4 (**25**); c. organic sample 8 (**35**); d. pottery fabric of **24**; e. synthetic calcium tartrate.

[56] G. Majno, *The Healing Hand: Man and Wound in the Ancient World* (Cambridge, 1975), 64, 124, 210–25; A. Tchernia, 'La vinification des romains', in G. Garrier (ed.), *Le vin des historiens: Actes du 1er symposium vin et histoire, 19, 20 et 21 mai, 1989* (Suze-la-Rousse, 1990), 65–74.

[57] L. Grivetti, 'Wine: The Food with Two Faces', and L. H. Lesko, 'Egyptian Wine Production during the New Kingdom', in McGovern et al. (eds), *The Origins and Ancient History of Wine*, 9–22 and 215–30, respectively (subsequently Lesko, 'Egyptian Wine'). Also see Majno, *Healing Hand*, 186–8, and, most recently, M. E. Weisse et al., 'Wine as a Digestive Aid', *British Medical Journal* 311 (1995), 1657–60. P. Dolara et al. ('Analgesic Effects of Myrrh', *Nature* 379 (1996), 29) report on another potentially valuable medicinal property of myrrh.

[58] *Historia naturalis* 14.57, 92, 107, 112, 131, and 134, with the claim (14.137) that 'there is no department of man's life on which more labour is spent.'

[59] *De re rustica*, 12.19–20.

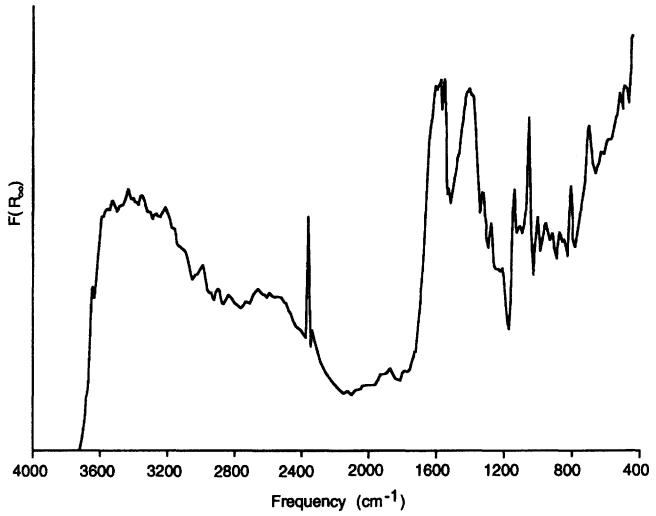


FIG 8. Diffuse-reflectance Fourier transform infrared spectra of a hypothetical mixture of 70% calcium tartrate and 30% pottery fabric (Appendix 1 **24**).

resins' and 'one of the most persistent drugs in history'.[60] It was already well established as a wine additive in the Neolithic period, and its use continued to expand in later periods throughout the ancient Near East and Egypt.[61] The terebinth tree has been and is widespread and abundant in the Middle East,[62] occurring even in desert areas of Egypt, and a single tree, which can grow to as much as 12 m in height and 2 m in diameter, can yield up to 2 kg of the resin.[63] Its 'turpentine' odour and taste, which was not as concentrated in the resin as in the distillate commonly known by this name today, was evidently not considered to be offensive.[64]

Although local sources might have been exploited in ancient Egypt, terebinth resin was also traded, as demonstrated by the numerous amphoras which were filled a quarter to a half full with resin lumps aboard the Uluburun shipwreck.[65] It should be noted that two of five samples (viz. from amphoras KW 144 and KW 181) from this fourteenth century BC ship also tested positive for tartaric acid/tartrate. Possibly, these jars had once been filled with wine or another grape product, or the terebinth resin might have been used in processing the latter or even preserving fresh or dried fruit.[66]

[60] Majno, *Healing Hand*, 64, 210.

[61] P. E. McGovern et al., 'Neolithic Resinated Wine', *Nature* 381 (1996), 381–1; P. E. McGovern, 'Vin extraordinaire', *The Sciences* 36 (1996), 27–31.

[62] M. Zohary, 'A Monographical Study of the Genus *Pistacia*', *Palestine Journal of Botany, Jerusalem Series* 5 (1952), 187–228.

[63] J. S. Mills and R. White, 'The Identity of the Resins from the Late Bronze Shipwreck at Ulu Burun (Kaş)', *Archaeometry* 31 (1989), 37–44. A. Lucas ('Resin from a Tomb of the Saïte Period', *ASAE* 33 (1933), 187–9; *AEMI*[4], 324) identified 50 kg of a resin inside a sarcophagus as that of *Pistacia atlantica*.

[64] In recent times, it has been used to make chewing gum in Greece (Mills and White, *Archaeometry* 31, 38) and to prepare perfume in the eastern desert of Egypt (M. E. Kislev, 'Reference to the Pistachio Tree in Near East Geographic Names', *PEQ* 117 (1985), 134–8).

[65] Pulak, *AJA* 92, 10–11.

[66] Fruits and other parts of the terebinth tree are most prevalent (Pulak, *AJA* 92, 11). Grape, fig, and olive seeds, as well as pomegranate and terebinth fruit, have also been recovered from the amphoras: see G. F. Bass, 'A Bronze Age Shipwreck at Ulu Burun (Kaş): 1984 Campaign', *AJA* 90 (1986), 278 and *AJA* 93, 10.

Myrrh (Eg. *ʿntyw*), which was indicated for two of the Malkata jars tested, was less widespread and less easily obtained. It was imported from Punt (possibly Somalia) in the New Kingdom, and possibly even successfully transplanted in Thebes.[67]

The tree resin in the Malkata wine is not specifically identified on the wine ostraca, perhaps because a small amount of this material was customarily added to the beverage from an early period. Whether the additive is equivalent to what is called 'resin' (Eg. *sft*; label types 198–9)[68] or 'incense' (Eg. *sntr*; types 211–14) on other Malkata labels is yet to be verified chemically. It should be pointed out that resins from pine, cedar, and other conifers, which were used in quantity in the mummification process and as aromatics in perfume and incense, had to be imported from abroad, since they grew with more difficulty and in insufficient numbers in Egypt to supply the market. Perhaps sig-

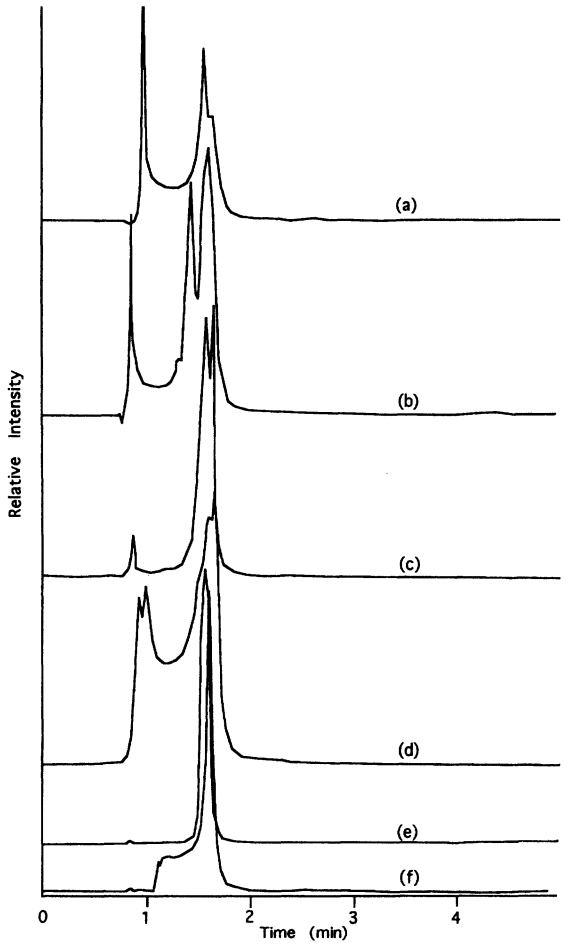


FIG 9. High-performance liquid chromatograms of a. organic sample 5 (Appendix 1 **34**); b. organic sample 6 (**23**); c. red lustrous spindle bottle (Royal Ontario Museum, Egyptian Dept. no. 910.85.15 (B.969)); d. modern myrrh (uncertain origin); e. Chian terebinth resin (sample from amphora KW 144, from the Uluburun shipwreck); f. L-(+) tartaric acid.

[67] *AEMI*, 92–4; Majno, *Healing Hand*, 120–4.

[68] The type numbers are according to Hayes, *JNES* 10.

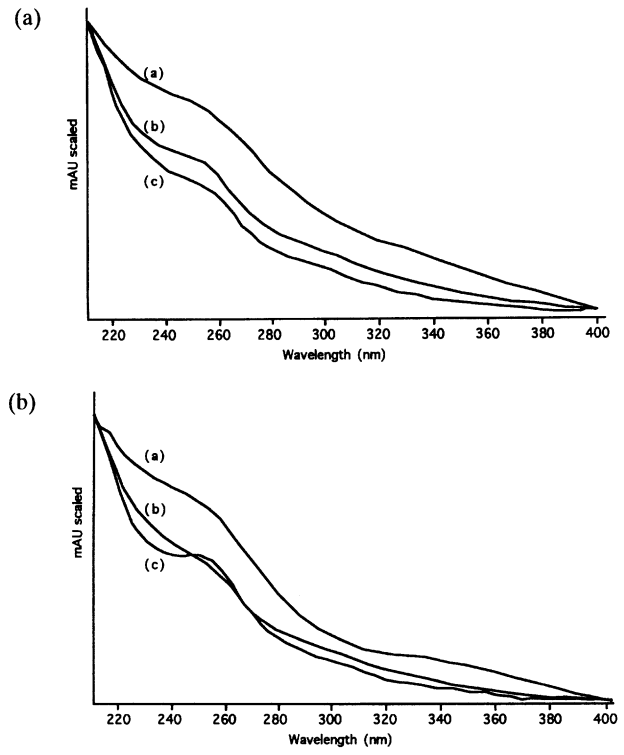


FIG 10. Ultraviolet absorption spectra at retention times of 1.1 (a) and 1.3 min (b) for a. organic sample 5 (Appendix 1 **34**); b. organic sample 6 (**23**); c. L-(+) tartaric acid.

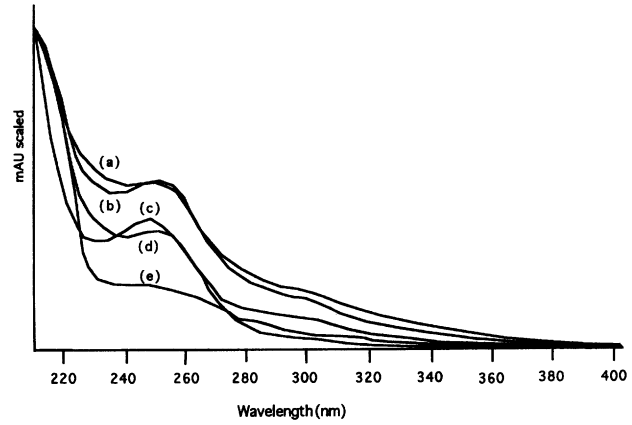


FIG 11. Ultraviolet absorption spectra at retention time of 1.6 min for a. red lustrous spindle bottle (Royal Ontario Museum, Egyptian Dept. no. 910.85.15 (B.969)); b. organic sample 5 (Appendix 1 **34**); c. organic sample 6 (**23**); d. modern myrrh (uncertain origin); e. Chian terebinth resin (sample from amphora KW 144, from the Uluburun shipwreck).

nificantly, four of six Malkata 'incense' jars were contributed to the palace by a captain of a commercial ship in the Mediterranean and Red Sea.[69]

A great deal of supporting documentary evidence exists for the production, transport, storage, and uses of Egyptian wine during the New Kingdom.[70] Tomb paintings vividly illustrate the process of viticulture and viniculture, from the trellised vineyards to the treading of the grapes in circular vats to the bottling and storage of the wine in amphoras (pl. XIV). The careful labelling of wine amphoras is an extension of this Egyptian realism. However, there are some details of the winemaking process that will probably never be known from textual or artistic sources, such as the particular grape varieties which went into these ancient Egyptian wines, whether they were sweet or dry, or whether they could be effectively aged in pottery vessels.[71] Microchemistry may eventually be able to fill in some of these lacunae by analysing for a range of constituents, including sugars, tannins and anthocyanins, and preservatives such as sulphite.[72] Molecular biology may even be able to tell us a great deal more about grape varieties, as well as yeast and bacterial fermentation processes.[73]

The Malkata ostraca are very definite about where most of the wine was produced: the region of the 'Western River', in the north-western Nile Delta, along the Canopic branch of the Nile which enters the Mediterranean at modern Alexandria. El-Amarna itself, the capital of Amenhotep III's son, Akhenaten, yielded 165 ostraca which state that the wine came principally from the 'Western River',[74] and the estates and vineyards listed on the 26 wine amphoras from the Annex of Tutankhamun's tomb[75] are also located there. The relative percentages of wine said to come from other locations than the western Nile Delta—the eastern and central Delta, Memphis, the western oases, and possibly Syria—are quite comparable in the Malkata and Amarna ostraca groups. A century following the Amarna Age,[76] the wine ostraca from the Ramesseum, the mortuary temple of Ramesses II in western Thebes, mention some 30 estates which were situated in a more regular fashion across the whole of the Delta.[77] According to the Great Papyrus Harris (I, 7,

[69] Hayes, *JNES* 10, 94.

[70] Lesko, *King Tut's Wine Cellar* and 'Egyptian Wine'; also see M.-C. Poo, *Wine and Wine Offering in the Religion of Ancient Egypt* (London, 1995).

[71] Lesko, *King Tut's Wine Cellar* and 'Egyptian Wine'.

[72] V. L. Singleton, 'An Enologist's Commentary on Ancient Wines', in McGovern et al. (eds), *The Origins and Ancient History of Wine*, 67–77; McGovern and Michel, 'Two Case Studies'.

[73] P. E. McGovern, 'Introduction: The Making of a Unique Conference, Its Accomplishments, and an Agenda for the Future', in McGovern et al. (eds), *The Origins and Ancient History of Wine*, ix–xv, and 'Science in Archaeology: A Review', *AJA* 95 (1995), 1.

[74] B. Gunn, in T. E. Peet and C. L. Woolley, *The City of Akhenaten*, I (MEES 38; London, 1923), 142–68; H. W. Fairman, in H. Frankfort and J. D. S. Pendlebury, *The City of Akhenaten*, II (MEES 40; London, 1933), 103–9, and III (MEES 44; London, 1951), 143–223. Additional examples are found in M. A. Leahy, 'The Hieratic Labels, 1979–82', in B. J. Kemp (ed.), *Amarna Reports*, II (EES Occasional Publications 2; London, 1985), 65–109.

[75] J. Černý, *Hieratic Inscriptions from the Tomb of Tutʿankhamūn* (Tutʿankhamūn's Tomb Series 2; Oxford, 1965), 1–4, 21–4, pls. i–v; also see Holthoer, 'Tutʿankhamun Pottery', and Hope, 'Tutʿankhamun Sealings'.

[76] The 'Amarna Age' is sometimes used in a generic sense, especially common in Syro-Palestinian archaeology, to denote the entire fourteenth century BC. In a strict Egyptological sense, the 'Amarna Age' does not begin until the founding of the new capital at el-Amarna by Amenhotep IV/Akhenaten. If one accepts a coregency of Amenhotep III and IV, however, most of the ostraca discussed here do belong to the 'Amarna Age' *in sensu strictu* and are contemporaneous with those found at Amarna (Hayes, *JNES* 10, 36–7).

[77] Lesko, 'Egyptian Wine', 226–7; for Delta vineyards of the Nineteenth Dynasty, see K. A. Kitchen, 'The Vintages of the Ramesseum', in A. B. Lloyd (ed.), *Studies in Pharaonic Religion and Society in Honour of J. Gwyn Griffiths* (EES Occasional Publication 8; London, 1992), 115–23.

10 ff),[78] Ramesses III (*c.* 1184–1153 BC) planted vineyards throughout the Delta, as well as in the oases and to the south of Egypt, using vintners and labourers whom he had captured in foreign expeditions. The king claims (I, 15a, 13 and 18a, 11) to have presented 59,588 jars of wine to his god Amun.

Production of wine in the Delta goes back to a very early period, at least the fourth millennium BC, when cuttings of the domesticated grape vine (*Vitis vinifera*) were probably introduced from Palestine.[79] Wine from this region was already the prerogative of rulers of the Predynastic and Early Dynastic Periods (*c.* 3300–2700 BC), and large jars of the First and Second Dynasties, precursors of the Canaanite jar type, had clay sealing stamped with the names of the kings, possibly the vineyard or estate, and the commodity, wine, in hieroglyphics.[80] Wine was also imported from Palestine.[81] A reassertion of Asiatic influence on winemaking in the Delta, beginning in the early Middle Bronze Age (*c.* 1900 BC), is clear from the excavations at Tell el-Dabʿa, which became the capital (Avaris) of the Semitic rulers called the Hyksos in the seventeenth century BC.[82] NAA and organic analyses also substantiate that wine was being imported in Canaanite jars from the Gaza region of southern Palestine to Tell el-Dabʿa in the north-eastern Delta *c.* 1900–1550 BC.[83] The expansion of the wine industry, the widespread production and use of the Canaanite jar (or amphora) throughout Egypt in the New Kingdom, and the common occurrence of vintners with Semitic names on the Malkata and Amarna Age ostraca (e.g. 'Khoru(y), the Syrian')[84] attest to the long-term impact of the Hyksos on native Egyptian culture.

Egyptian pottery specialists are agreed that the Malkata amphoras are made of Marl D, the most commonly occurring fabric for amphoras in New Kingdom Thebes as well as sites throughout Egypt (e.g. at Amarna, Abydos, Memphis, and Qantir). Because of the mention of the 'Western River' on many of the wine labels and the relative prevalence of Marl D vessel types at Qantir[85] and in the Memphis–Fayyum region,[86] it has been proposed that the source for this clay exists somewhere on the Delta periphery or Middle Egypt,[87] perhaps in the Wadi Natrun, or near Heliopolis, or along the Wadi Tumeilat

[78] J. H. Breasted, *Ancient Records of Egypt* (Chicago, 1906–07), IV, sections 151–412.

[79] T. G. H. James, 'The Earliest History of Wine and Its Importance in Ancient Egypt', in McGovern et al. (eds), *The Origins and Ancient History of Wine*, 197–213 (subsequently James, 'Earliest Wine'); Stager, 'Firstfruits'; P. E. McGovern et al., 'The Beginnings of Winemaking and Viniculture in the Ancient Near East and Egypt', *Expedition* 39 (1997), 3–21.

[80] James, 'Earliest Wine', 198–201.

[81] More than 200 jars of Syro-Palestinian types were found intact and *in situ* in an Early Dynastic royal tomb at Abydos (G. Dreyer, 'Umm el-Qaab: Nachuntersuchungen im frühzeitlichen Königsfriedhof, 5./6. Vorbericht', *MDAIK* 49 (1993), 23–62). NAA and organic analyses by the author and co-workers (see McGovern et al., *Expedition* 39, 5–12) show that wine, with tree resin, grapes and figs as additives, was being imported from the southern Hill Country of Palestine, the Jordan Valley, and Transjordan.

[82] M. Bietak, 'Ein altägyptischer Weingarten in einem Tempelbezirk (Tell el-Dabʿa 1. März bis 10. Juni 1985)', *AÖAW* 122 (1985), 267–78; also see n. 38, above.

[83] McGovern and Harbottle, 'Hyksos' and McGovern, *Foreign Relations*.

[84] Hayes, *JNES* 10, 102.

[85] D. A. Aston, 'Qantir/Piramesse-Nord—Pottery Report 1988', *GM* 113 (1989), 7–24; D. A. and B. G. Aston, 'Pelizaeus-Museum Excavations at Qantir: Pottery Fabrics and Ware Groups', *Ägypten und Levante*, forthcoming.

[86] J. D. Bourriau and P. T. Nicholson, 'Marl Clay Pottery Fabrics of the New Kingdom from Memphis, Saqqara and Amarna', *JEA* 78 (1992), 29–91.

[87] Nordström and Bourriau, 'Ceramic Technology', 181; also see Hope, *Malkata Sealings*, 73–4, and 'Tutcankhamun Sealings', 99.

where Pliocene and later marl clays are found.[88] Previously, a Theban origin for Marl D was advocated.[89] Known clays in the Nile Delta proper are of alluvial origin, even those of the so-called 'turtle-backs' of Pleistocene date,[90] and are not suitable for making dense, impermeable fabrics, such as are required for shipping liquid goods. The NAA results have helped to resolve the issue of Marl D's clay source, at least in Upper Egypt. The fabric from which the vast majority of the Malkata wine ostraca is made is most likely a local Theban marl clay.

It should be stressed, however, that the exact location of the ancient marl clay deposit that was exploited in the Theban area is unknown. A programme of clay sampling and analyses is needed to resolve this issue, on the assumption that the ancient clay bed was not completely exhausted; if it were, then other deposits in the region may be similar enough chemically to demonstrate a local origin. Marl *tafl* (= shale) deposits, which were laid down between Upper Cretaceous and Miocene times, have been reported at the entrance to the Valley of the Queens and south of Deir el-Moharrib,[91] as well as outcropping in many places along the limestone escarpment.[92] The *tafl* was redeposited secondarily and mixed with Nile alluvium in the early Pleistocene as the Armant formation,[93] which is exposed along the eastern and western cliffs of the Thebaid.[94] These fine-grained calcareous, marly sediments are ideal for pottery-making, as are mixtures of *tafl* and Nile alluvial clay used in modern times to make pottery at a village south of the Birket Habu and in Luxor.[95]

Since Marl B and C fabrics are also included in the local Theban group of Marl D amphoras, it would appear that the macroscopic/sub-microscopic distinctions of the Vienna System of pottery classification are not always correlated with clay origins.[96] The differences between the marl fabrics may also be a function of clay preparation, addition of temper, and firing. Similar New Kingdom industries in the north and south might then have produced Marl D wares that are comparable to one another in inclusional content, colouration, and other physical features, but be made of different clays.[97] At Thebes, Marl D was especially used for amphoras, whereas smaller, more open forms and special artifact types were sometimes made of Marl A4 and Marl B.

The significance of the finding that the Malkata amphoras were probably locally manufactured is that wine and other goods produced in the Nile Delta, Memphis, the

[88] Do. Arnold, 'Ägyptische Mergeltone ("Wüstentone") und die Herkunft einer Mergeltonware des Mittleren Reiches aus der Gegend von Memphis', in Do. Arnold (ed.), *Studien zur altägyptischen Keramik* (Mainz, 1981), 182–3 (subsequently Arnold, 'Mergeltone').

[89] Nordström, *LÄ* VI, 633–4.

[90] For discussion and references, see Arnold, 'Mergeltone', 182, nn. 79–82.

[91] Hope, *Malkata Sealings*, 74, n. 6, and *Three Studies*, 162.

[92] K. W. Butzer, 'Modern Egyptian Clays and Pre-Dynastic Buff Ware', *JNES* 33 (1974), 381–2.

[93] Said, *Geology*, 40–4; also see Tobia and Sayre, 'Analytical Comparison', 110, 112.

[94] R. Said, *The Geological Evolution of the River Nile* (New York, 1981), fig. 12.

[95] Hope, *Three Studies*, 162; P. Brissaud, *Les ateliers de potiers de la région de Louqsor* (BdÉ 78; Cairo, 1982), 69–72; also see Arnold, 'Mergeltone', 177.

[96] Cf. Nordström and Bourriau, 'Ceramic Technology', 175–81.

[97] Before claiming that the Marl D vessels at Qantir and Memphis/Saqqara are of Theban marl clay, chemical analyses of a range of pottery types from these sites need to be carried out. It has been established that Marl D is not a homogeneous group in Lower and Middle Egypt (Bourriau and Nicholson, *JEA* 78, 37–41, 51–4, 71; Nordström and Bourriau, 'Ceramic Technology', 181–2). Perhaps some of the fabric distinctions of the Vienna System have less to do with clay origins than with workshop procedures. Theban pottery practices might well have been transferred to other regions of Egypt.

Fayyum, or possibly Syria, were either 'rebottled' at Thebes for palace use or the vessels were made at Thebes and transported to other regions for filling. Since the Egyptian preposition 'of/from' is non-specific, it is possible to argue that a certain geographic region, estate, or person donated wine which was actually made in Thebes, but this is less likely. Wine production in the hot, dry climate of Thebes,[98] which did become more common in later periods, cannot account for the large amounts of wine that were involved in the *sed*-festivals nor the abundant documentary evidence that Amarna Age wine was produced almost exclusively in the Delta. Rebottling the wine and other commodities in locally made amphoras, which were of uniform type fabric, labelling, and sealing and generally used only once, would be in keeping with the special character of the *sed*-festivities. This scenario assumes a royal pottery-producing centre and central registration facility at Thebes, neither of which has been uncovered in excavations but can be reasonably postulated to have existed.

Potters are known to have been active during the Nineteenth Dynasty at the village of Deir el-Medineh.[99] An antecedent for this industry is attested in the unique pottery workshop scene on a wall painting in the tomb of Kenamun (TT 93),[100] dating to the reign of Amenhotep II and presumably still in operation a half century later at the time of Amenhotep III. Dorothea Arnold[101] suggests that the red-coloured material in two large vats ('baskets') and piled on the ground in the Kenamun tomb scene is a marl clay. The low 'fast' wheel, which is operated with an assistant and combined hand and foot actions of the potter, and multiple examples of pottery types (although not including any amphoras) point to a highly specialised, royal industry.

A royal administrative and registration facility must also have existed to register goods going into and out of the capital and the palace. Scenes in Eighteenth Dynasty Theban tombs clearly show sealings being applied to amphoras and stamped (pl. XIV, 2).[102] A stamp for a fat label, obviously intended for an amphora sealing, was accidentally stamped onto a locally-made mudbrick from Malkata,[103] and a stamp reading 'Wine from the Western River' was recovered from the nearby mortuary temple of Thutmose IV.[104] Therefore, it is conceivable that the postulated royal registration centre would have had a full collection of the necessary stamps for sealing vessels.

The more detailed dockets in ink could also have been added during the registration process, at or about the same time that the Malkata amphoras were sealed in Thebes. This activity is not shown in the tomb paintings, and discrepancies between the stamp and docket inscriptions on the same amphoras in Tutankhamun's tomb[105] are great enough to suggest that the latter were sometimes written at a different time and/or place. The hieratic scripts of the ostraca and sealings, which vary considerably because of the

[98] See Hope, 'Tutʿankhamun Sealings', 134, n. 118.

[99] Sylvie Marchand, personal communication; also see M. L. Bierbrier, *The Tomb-Builders of the Pharaohs* (London, 1982), 39.

[100] N. de G. Davies, *The Tomb of Ḳen-Amūn at Thebes* (MMA Egyptian Expedition 5; New York, 1930), p. lix.

[101] 'Techniques and Traditions of Manufacture in the Pottery of Ancient Egypt', in Arnold and Bourriau (eds), *An Introduction to Ancient Egyptian Pottery*, 75–8.

[102] Hope, 'Tutʿankhamun Sealings', 93–4, 134, n. 118, fig. 2.

[103] Hayes, *JNES* 10, 161.

[104] Hope, 'Tutʿankhamun Sealings', 97, citing W. M. F. Petrie, *Six Temples at Thebes, 1896* (London, 1897), 7, pl. x.23.

[105] Hope, 'Tutʿankhamun Sealings', 132.

numerous scribes involved in the labelling process over a protracted period, cannot be localised to any specific region of Egypt.[106]

This scenario of rebottling goods, especially for the *sed*-festival, assumes that the wine and other commodities were delivered to Thebes in other containers. Amphoras with foreign goods, which were probably unlabelled, could have been delivered by ship directly to the registration facility in Thebes (cf. fig. 12). Presumably, amphoras coming from other parts of Egypt would be labelled, and these containers would be disposed of or reused after their contents were transferred. If a pottery vessel lacked a docket or stamped sealing, then bills of lading or inventories, perhaps on papyrus, would have been needed to identify the goods.

While the proposal of a local rebottling and registration process is the most parsimonious explanation for the available evidence, it is possible that the wine amphoras in particular were produced of marl clay in a royal workshop in Thebes, shipped downstream to royal vineyards, primarily in the Delta, filled there, and then returned to Thebes. Wines imported from abroad could also have been transferred to Egyptian Marl D amphoras in the Delta. The main objection to this reconstruction is that none of the Malkata wine sealings is punctured.[107] A young wine shipped up the Nile would have been subject to mixing and heating, and would have produced gases from unfinished or renewed fermentation and other chemical reactions. Puncturing the sealing allows the gases to escape; otherwise, the vessel may explode. To leave the mouth of the amphora open to the air is equally unsatisfactory, since the bacteria that convert wine to vinegar will proliferate. A compromise solution might have been to stuff the mouth of the amphora with reed, leaf and clay bungs and/or pottery sherds, which are found inside most clay sealings, and perhaps to tie a cloth or leather cover over the opening. When the amphora arrived in Thebes, it would then have been permanently sealed, a process which was evidently carried out only once for each vessel.[108] The assumption that an amphora would be sealed as soon as it was filled[109] is thus unlikely for wine, unless the sealing were provided with a secondary fermentation lock, which could be plugged up later. Since none of the Malkata wine vessels was so provided, the most likely explanation is that they were sealed in Thebes.

However, the shipment of empty amphoras, made of Theban marl clay, to the Delta for filling might also help to explain the large numbers of specialised Marl D vessels (flasks, tankards, etc., in addition to amphoras), most likely intended for valuable commodities,[110] which are concentrated in Middle and Lower Egypt in the Eighteenth and Nineteenth Dynasties. A precedent existed for centralised, royal pottery production and distribution. In the Memphite region during the Middle Kingdom and the Second Intermediate Period, specialised Marl C types, especially jars, were concentrated in the area near the capital of Itj-tawy (Lisht) and distributed to a limited extent to other parts of the country.[111] A closely matching Upper Eocene clay source (the Qasr el-Sagha

[106] See Leahy, *Malkata Inscriptions*, 2, 57–63.

[107] Hope, *Malkata Sealings*, 7; cf. 'Tutʿankhamun Sealings', 135.

[108] Superimposed stamps might conceal evidence of resealing, but, besides being unlikely, there are few such instances: Hope, *Malkata Sealings*, 7–8.

[109] Hope, 'Tutʿankhamun Sealings', 96, with references.

[110] Hope, *Three Studies*, 14, 99, n. 18.

[111] Arnold, 'Mergeltone', 183–90; Nordström and Bourriau, 'Ceramic Technology', 179–81.

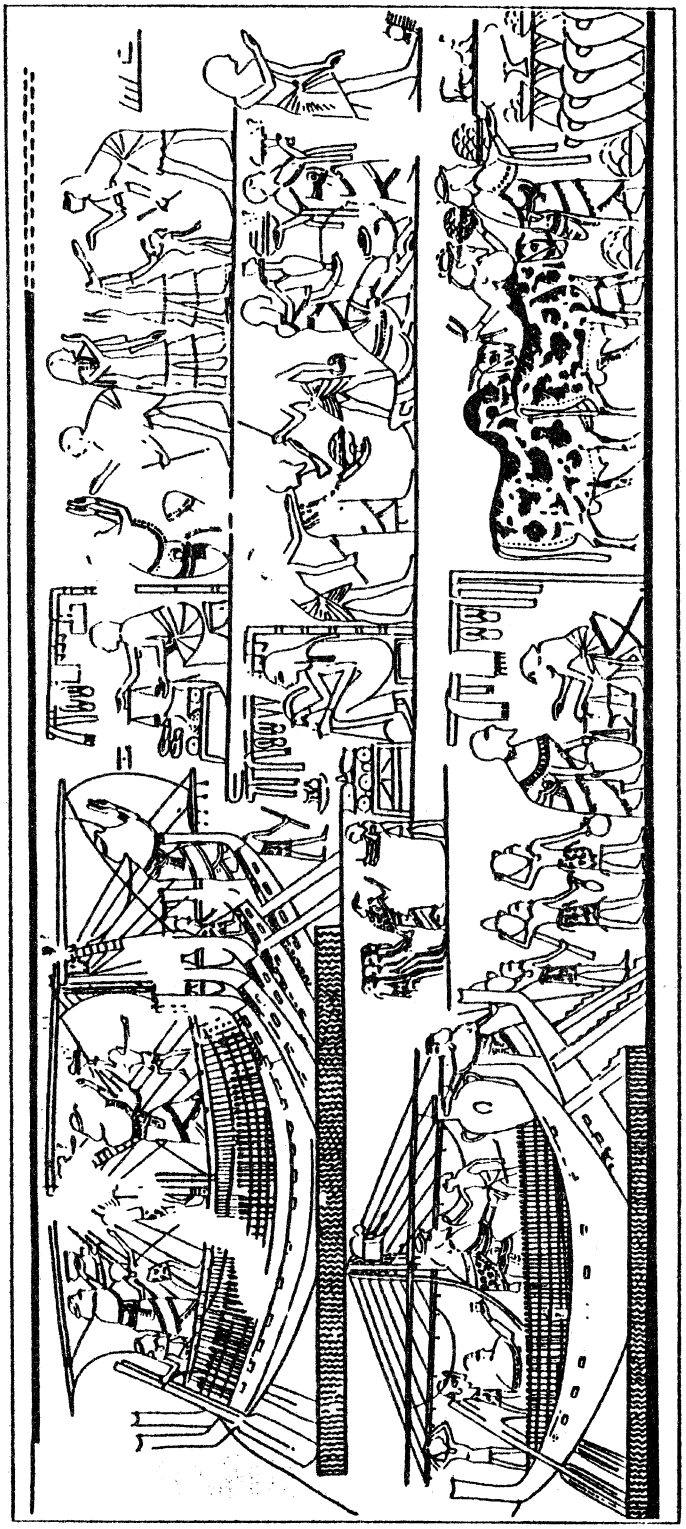


FIG 12. Painting showing amphoras and various goods being unloaded and registered, from the Eighteenth Dynasty tomb of Kenamun (TT 93) (after Davies and Faulkner, *JEA* 33, pl. viii; courtesy of the EES)

formation) for Marl C exists north of Lake Qarun in the Fayyum,[112] not far from Lisht. The contemporaneous Maadi formation shales in the region south of Cairo are of similar chemical composition, as are secondary Pleistocene deposits in the Fayyum basin,[113] and might also have been exploited in antiquity to make Marl C vessels. The well-known modern waterjars made of so-called *kulleh*-clay, a secondarily deposited Pleistocene clay found in the Wadi Qena,[114] represent a recent example of pottery mass-production and distribution.

One of the Malkata wine amphoras was made of Nile alluvial clay, which was also available locally at Thebes. Because of the mixing of sediments along the course of the Nile, the alluvial clays are notoriously inhomogeneous.[115] The particular ostracon (Appendix 1 **34**) is not a tight member of the principal north-eastern Nile Delta clay and pottery group that was used for MED and MDP distance and probability comparisons, suggesting that the sample is from another area along the Nile, possibly Thebes itself.

Among the Malkata wine amphoras that were analysed, only two ostraca (**4** and **16**) were definitely non-local. Both are of a whitish ware, which has been described as similar to the modern *kulleh*-ware made in Qena, about 75 km north of Thebes. These imports, the former stating that it comes from an undefined western oasis and the latter said to be 'of/from *Pr-wsḫ*' (probably the Kharga Oasis), are chemically distinct from one another, and do not match *kulleh*-ware or any other well-defined Egyptian marl clay. The Kharga Oasis is only about 250 km west of Thebes; as the largest and most fertile of the western oases, it was well known for its wine in antiquity.[116] An overland trade route also connected the Kharga Oasis with three other western oases and the Fayyum to the north. Enlargement of the NAA databank for these oases will very likely demonstrate that the two non-local ostraca do originate from where their labels claim they do. The wine in these amphoras was probably not rebottled in vessels made of Theban marl clay, because royal pottery workshops, with access to good marl clays, might well have been established in the major western oases, in particular Kharga, during the Eighteenth Dynasty.

The transport of wine in amphoras of various sizes is clearly attested in New Kingdom paintings.[117] Physical remains of a rope sling for transporting a very heavy amphora were recovered from the Theban tomb of Meryet-Amun,[118] queen of Amenhotep II. Presumably, donkeys were principally used for overland transport from the western oases to Thebes or to reach the nearest point on the Nile where river transport was available. The unloading of amphoras from a Syrian merchantman (fig. 12), possibly even in the harbour of Malkata (Birket Habu), is depicted in the tomb of Kenamun (TT 93), 'Mayor of the Southern City, Overseer of the granary of Amun'.[119]

[112] Said, *Geology*, 102–3; McGovern et al., *BASOR* 296, 40.

[113] Tobia and Sayre, 'Analytical Comparison', 108–12.

[114] Nordström and Bourriau, 'Ceramic Technology', 161.

[115] R. Allen and H. Hamroush, 'The Application of Geochemical Techniques to the Investigation of Two Predynastic Sites in Egypt', in J. B. Lambert (ed.), *Archaeological Chemistry III* (Advances in Chemistry Series 205; Washington, DC, 1984), 51–65.

[116] O. E. Kaper, 'Egyptian Toponyms of Dakhla Oasis', *BIFAO* 92 (1992), 120–1.

[117] E.g. N. de G. Davies, *Paintings from the Tomb of Rekh-Mi-Rēʿ at Thebes* (New York, 1935), pl. 15, showing large and small sealed amphoras being transported into the treasury of Amun at the beginning of the reign of Amenhotep II.

[118] H. E. Winlock, *The Tomb of Queen Meryet-Amūn at Thebes* (MMA Egyptian Expedition 6; New York, 1932), pl. xxxi.

[119] N. de G. Davies and R. O. Faulkner, 'A Syrian Trading Venture to Egypt', *JEA* 33 (1947), 40–6.

The clay origin of the *ben*-oil ostracon (**36**), the only example in the Malkata corpus of an amphora labelled exclusively with this natural product, is very certain. The jar is said to be 'of/from the mayor of She-Sobek', a location usually understood as referring to the Fayyum. The moringa tree (*M. aptera*), from which the oil is derived, is probably indigenous to Egypt and thrives in tropical climates throughout north-eastern Africa and the southern Levant.[120] It is possible that commercial production of the oil in the Amarna Age was carried out at an oasis which is as yet unrepresented in the NAA databank. Moringa nut oil, a sweet, odourless liquid that does not easily become rancid, would be an excellent substitute for tree resin in wine (e.g. the unique ostracon in the Malkata ostracon corpus **32**).

Finally, a few brief remarks about the one Malkata 'ale' jar tested (**37**) are in order. Egypt was primarily a beer-drinking culture, since barley could be grown easily in the alluvial plains in the Nile Valley.[121] Sprouted and dried grain (malt) kept well, until it was ready to be fermented into the beverage. Unlike wine, beer could not be preserved in sealed jars, and had to be drunk soon after it was made. The usual word for 'beer' (Eg. *ḥnqt*) thus occurs only once, if at all,[122] in the Malkata ostracon corpus (**38**). Beer was drunk at feasts and other ceremonies, so it must have generally been supplied to the palace in unlabelled containers. By contrast, what Hayes translates as 'ale' (Eg. *srmt*) is the second most frequently attested commodity in the Malkata amphoras and was evidently imported as a well-preserved solid material from which a liquid beverage was made.[123] The chemical finding of oxalate in the Malkata 'ale' jar indicates that *srmt* was very likely a barley product, as was ordinary beer. The difference between the two commodities might then be that the 'ale' of the Malkata ostraca is a kind of yeast starter which was preserved under relatively acidic and anaerobic conditions[124] and could be transported in sealed amphoras with minimal spoilage. Like yogurt,[125] an acidic milk product fermented using bacteria rather than yeast, it could have been eaten as a solid or diluted with water and drunk. The one definite 'ale' amphora and possibly a second (**38**) were made of probable local Theban marl clay.

The Malkata ostraca have only begun to yield their textual and chemical secrets about court life during one of the most prosperous periods of antiquity. Supplied by goods imported from other parts of Africa and the Eastern Mediterranean, the Malkata palace at Thebes during the reign of Amenhotep III reflects the internationalism of the period, which had profound effects on native Egyptian culture and technology.[126] Fermented beverages had long played an important part in Egyptian economic, social, and religious life. During the Amarna Age and the later New Kingdom, the Egyptian wine industry greatly expanded in the Delta and elsewhere in the country, at the same time that foreign

[120] Stager, 'Firstfruits', 175.

[121] W. Helck, *Das Bier im alten Ägypten* (Berlin, 1971); J. Geller, 'From Prehistory to History: Beer in Egypt', in R. Friedman and B. Adams (eds), *The Followers of Horus: Studies Dedicated to Michael Allen Hoffman, 1944–1990* (Oxford, 1992), 19–26.

[122] According to Hayes' restoration (*JNES* 10, 91).

[123] W. Helck, *Materialen* III, 495–6 (691–2) and IV, 184–5 (792–3); Hayes, *JNES* 10, 91; Leahy, *Malkata Inscriptions*, 5–6, 48, n. 9.

[124] S. H. Katz and M. M. Voigt, 'Bread and Beer: The Early Use of Cereals in the Human Diet', *Expedition* 28 (186), 23–34.

[125] F. W. James, 'Yogurt: Its Life and Culture', *Expedition* 18 (1975) 32–8.

[126] See P. E. McGovern (ed.), *Cross-Craft and Cross-Cultural Interactions in Ceramics* (Ceramics and Civilization 4; Westerville, OH, 1989), 1–11, 147–95.

vintages flowed in from abroad. Several hundred years earlier, the Canaanite jar, the transport container *par excellence*, was probably adopted by Egyptian vintners in the Delta, where it began to be made of locally available Egyptian clays. Its use soon spread to other commodities, so that by the time of the Amarna Age, this amphora type was being produced in large numbers throughout Egypt. At Malkata, foreign and domestic goods of special importance and, to a large extent, fermented beverages or related products, were carefully rebottled in well-made amphoras and flasks of local marl clay, stoppered, sealed, labelled, and presented at special state and religious occasions. The pharaoh and the gods of Egypt, whose purview extended to the limits of then-civilised world, would not have expected anything less.

Appendix 1: Palace of Amenhotep III (Malkata) Catalogue of ostraca analysed

Wine jars

1 Inscription 10.1:[1] 'Year 30, wine of the estate of Nebmaatre ... Western River ... the chief vintner ... '
Rubbish mounds
Mottled whitish exterior; white residue patches on interior
NAA no. PMG254: probable Theban marl clay

2 Inscription 14.1: 'Wine for the ... first [*sed*-] festival of His Majesty, l.p.h.! (life, prosperity, health!) [of/from] the estate ... '; possibly Year 30
No provenance
White slip on exterior
NAA no. PMG277: probable Theban marl clay

3 Inscription 18.1: '[Year x] + 1, wine of/from [the estate of the Ro]yal Wife, may she live!'
Rubbish mounds
Horizontally defined reddish residue on interior
NAA no. PMG264: probable Theban marl clay

4 Inscription 19.1: 'Year 31, wine of/from the oasis'
No provenance
Whitish fabric
NAA no. PMG331: ?; no matches at MED 0.1—possibly a western oasis marl

5 Inscription 21.1: 'Year 32, wine of/from the [Western] River ... [of/from the estate of ...] ... Splendour-of-the-Aten, the chief [vintner] ... '
Rubbish mounds
NAA no. PMG268: probable Theban marl clay

6 Inscription 23.1: '[Year x] + 2, wine of/from the vineyard [of the mansion of pharaoh, l.p.h.! (life, prosperity, health!)][2]
No provenance
NAA no. PMG269: probable Theban marl clay

7 Inscription 23.2: '... vineyard of/from the mansion of pharaoh, l.p.h.! (life, prosperity, health!)';[3] possibly Year 32, based on **8**
No provenance

[1] The type numbers are according to Hayes, *JNES* 10, 35–56, 82–111.
[2] This reconstruction is based on **7**.
[3] The inscription does not mention wine, but the formula supports this interpretation.

NAA no. PMG265: probable Theban marl clay

8 Inscription 24.1 (= MMA 17.10.10): 'Year 32, good wine of/from the mansion'
South Village
Thin, white slip on exterior; red-painted 'potter's mark'
NAA no. PMG259: ?; no matches at MED 0.1—possible Theban marl clay

9 Inscription 33: '[Year] 34, wine of/from the [Western] River ... the [chief] vintner Amenemone'
No provenance
Thick, red residue on interior
Organic sample 9: probable terebinth resin
NAA no. PMG257: probable Theban marl clay

10 Inscription 33.1: '[Year] 34, wine of/from the [Western] River ... the chief vintner Amenemo[ne]'
No provenance
White slip on exterior
NAA no. PMG271: probable Theban marl clay

11 Inscription 41: 'Year 35, wine of/from Per-hebyt (town in central Delta = modern Behbet el-Hajar) ... the chief [vintner] ... '
Middle Palace (Ho.2.W)
Thick, dark brownish residue on interior
Organic sample 7: calcium tartrate and probable terebinth resin
NAA no. PMG263: probable Theban marl clay

12 Inscription 46.1: 'Year 36, wine of/from the Western River'
Middle Palace (Ho.2.B)
NAA no. PMG266: probable Theban marl clay

13 Inscription 48.1: 'Year 36, wine of/from the estate of the overseer of the treasury'
Middle Palace (Ho.2.W)
Thin, reddish residue on interior
NAA no. PMG262: probable Theban marl clay

14 Inscription 48.2 (= MMA 17.10.9): 'Year 36, wine of/from the estate of the overseer of the treasury'
Middle Palace (Ho.2.W)
Whitish exterior
NAA no. PMG260: probable Theban marl clay

15 Inscription 48.3: 'Year 36, wine of/from the estate of the overseer of the treasury'
Middle Palace (Ho.2.W)
Thin, reddish residue on interior
NAA no. PMG261: probable Theban marl clay

16 Inscription 49.1: 'Year 36, good wine of/from *Pr-wsḫ* (literally 'broad house' or 'estate', probably modern Kharga Oasis)'
'Palace', no. 6P1009
Whitish fabric
NAA no. PMG258: ?; no matches at MED 0.1—possibly a western oasis marl

17 Inscription 52.1: 'Year 36, wine of/from Tjaru (= Sile), Panedjebu'; 'very good' written twice, to the right and left, under the handle
Middle Palace (Ho.2.W)
NAA no. PMG273: probable Theban marl clay

18 Inscription 54.1: '[Year 37, w]ine of the estate Nebmaatre l.p.h.! (life, prosperity, health!) [-is-the-Splendour-of-the-Aten of/from the Wes]tern [River], the chief vintner *Nh* ... [Naharin = Mitannian?]'[4]
No provenance
NAA no. PMG248: probable Theban marl clay

19 Inscription 54.2: '... Western River, the chief vintner ...'[5]
Ho.B (labelled B on fig. 1, south of Ho.3.W)
NAA no. PMG276: probable Theban marl clay

20 Inscription 55.1: 'Year 37, wine of/from the Wes[tern] River ... [of/from] the estate of Nebmaatre-l.p.h.! (life, prosperity, health!)-is-the-Splendour-of-the-Aten, chief vintner ...'
Middle Palace (Ho.2.W)
NAA no. PMG270: probable Theban marl clay

21 Inscription 55.2: '[Year 37, win]e of/from the Western River of [the estate Nebmaatre] l.p.h.! (life, prosperity, health!)-is-the-Splendour-of-the-Aten, the chief vintner Ptahmai'
Middle Palace (Ho.2.W)
Yellowish fabric
NAA no. PMG251: probable Theban marl clay

22 Inscription 58.1: 'Year 37, wine of/from the mansion ... [in Men]-nefer (= Memphis), chief vintner'
'Ho.1.B', not shown on fig. 1; excavated by the University of Pennsylvania Museum expedition in the rubbish mounds
NAA no. PMG332: probable Theban marl clay

23 Inscription 59: 'Year [37]'[6]
No provenance
Thick, dark brownish residue on interior
Organic sample 6: tartaric acid and myrrh
NAA no. PMG249: probable Theban marl clay

24 Inscription 60.1: 'Year [37], wine of/from the *ꜥt-ḫt* (orchard or vineyard?) of Nebmaatre ... 6 *min*'[7]
Palace
NAA no. PMG255: probable Theban marl clay

25 Inscriptions 62.2 + 42.1: 'Year 38, genuine wine' (Inscription 62.2) written over 'Year 36 (37?), wine, season of *prt*, Lifting-up-of-the-year festival, estate [of] Nebmaatre, 9 *min*/*hin*'[8] (Inscription 42.1)
Middle Palace (Ho.2.W)
Thick, brownish residue on interior
Organic sample 4: calcium tartrate and probable terebinth resin
NAA no. PMG267: probable Theban marl clay

26 Inscription 63: 'Genuine wine';[9] no year
Provenance uncertain

[4] See Hayes, *JNES* 10, 102.

[5] The inscription does not mention wine, but the first line is broken off the sherd, and 'wine' should probably be restored based on other inscriptions of the same type (see Hayes, *JNES* 10, 88–9).

[6] Complete examples include the word 'wine': see Hayes, *JNES* 10, fig. 7.

[7] The volume is *c.* 29–115 l, since *1 min* = *c.* 10–40 *hin*, and 1 *hin* = 0.48 l: see W. Helck 'Masse und Gewichte', *LÄ* III, 1202; J. J. Janssen, *Commodity Prices from the Ramessid Period: An Economic Study of the Village of Necropolis Workmen at Thebes* (Leiden, 1975), 330, 340–1; Hope, *Three Studies*, 109, n. 13.

[8] Viz. *c.* 4.3–173 l; Hayes, *JNES* 10, 105, reads '(of/for) offerings' instead of 'genuine'.

[9] Ibid. 105.

Thick, reddish deposit on interior
Organic sample 2: calcium tartrate and probable terebinth resin
NAA no. PMG228: probable Theban marl clay

27 Inscriptions 63.1 + 54.4: 'Genuine wine' (Inscription 63.1) written over 'Year 37, wine of/from the estate of Amenhotep ... the Western River the chief vintner Pa'[10] (Inscription 54.4)
Middle Palace (Ho.2.W)
NAA no. PMG272: probable Theban marl clay

28 Inscription 73.1: '[Wine] of/from the oasis'; no year
Palace
Hand-burnished white slip on exterior
NAA no. PMG333: probable Theban marl clay

29 Inscription 74.1: 'Very good wine of/from Tjaru (= Sile)'
'Palace', no. 6P1008
Hand-burnished white slip on exterior
NAA no. PMG275: probable Theban marl clay

30 Inscription 74.2: 'Very good wine of/from Tjaru (= Sile)'
Rubbish mounds, no. 6P1008
Hand-burnished white slip on exterior
NAA no. PMG274: probable Theban marl clay

31 Inscription 75.1: 'Wine of/from Tjaru (= Sile), Bay'; no year
Ho.B (labelled B on fig. 1, south of Ho.3.W)
Probable whitish slip on exterior
NAA no. PMG278: probable Theban marl clay

32 Inscription 77.4 + 195bis: '[Wine] of/from Kharu [Syria] ... overseer of the fortress Thutmose' (Inscription 77.4) joins with '... sweet [*b*]*en*-oil of/from ...' (Inscription 195bis); no year
Palace
Burnished white slip on exterior; reddish deposit on interior
Organic sample 3: calcium tartrate and probable terebinth resin
NAA no. PMG252: probable Theban marl clay

33 Inscription 78: 'Good wine of/from the royal scribe Huy'; no year
Palace
Burnished white slip on exterior; thick, red residue on interior
Organic sample 1: calcium tartrate and probable terebinth resin
NAA no. PMG250: probable Theban marl clay

34 Inscription 81: '[Win]e of/from the *ḫrd n kꜣp* ('child of the nursery') *Kmi*'; no year
Rubbish mounds
Shiny black residue on interior
Organic sample 5: tartaric acid and probable myrrh
NAA no. PMG253: Nile alluvial clay

Honey and wine jar

35 Inscriptions 209.1 + 1: 'Honey of/from the beekeeper Huy and the beekeeper Bakamun, [x] *hin*' (Inscription 209.1) written over 'Year 9, wine of the estate Nebmaatre [which is in the] ... the chief vintner Amen[hotep]' (Inscription 1)
Amun temple
Burnished white slip on exterior; red residue on interior

[10] Ibid. 105.

Organic sample 8: calcium tartrate and probable terebinth resin
NAA no. PMG256: probable Theban marl clay

Ben-oil jar

36 Inscription 186.1: 'Fresh *ben*-oil for the *sed*-festival ... [of/from] the mayor of She-Sobek ('the Lake of Sobek' = Fayyum)'; no year
No provenance
NAA no. PMG340: ?; no matches at MED 0.1

'Ale' and possibly 'beer' jars

37 Inscription 103: '*srmt* ('ale'), requirement of/from the mayor of Tjebu'; no year
No provenance
Organic sample 10: oxalate
NAA no. PMG326: probable Theban marl clay

38 Inscription 118.1: ' ... of/from Kedy (= Syria?), of/from the overseer of the fortress (literally, 'sealed place')';[11] no year
No provenance
NAA no. PMG334: probable Theban marl clay

Meat jars

39 Inscription 158.136: 'Year 34, pounded meat ... the stockyard of the chamberlain ... '
No provenance
NAA no. PMG335: probable Theban marl clay

40 Inscription 164.10: 'Year 37, meat ... stockyard of the chamberlain ... '
No provenance
NAA no. PMG336: probable Theban marl clay

41 Inscription 164.11: '[Yea]r 37, pounded meat for the third *sed*-festival ... '
Rubbish mounds
NAA no. PMG337: probable Theban marl clay

42 Inscription 165.3: 'Year 37, pounded meat ... His Majesty l.p.h.! (life, prosperity, health!) of/from the stockyard of the royal [scribe?] ... '
No provenance
NAA no. PMG338: probable Theban marl clay

43 Inscription 166.1: 'Pounded meat ... of/from the *wabet* ('slaughter yard'), Panedjem';[12] no year
Rubbish mounds
NAA no. PMG339: probable Theban marl clay

44 Inscription untyped meat 19: 'Pounded meat for the repetition ... [of the *sed*-festival] ... stockyard of the royal scribe Kha, prepared by the butcher ... '; no year
No provenance
NAA no PMG 341: probable Theban marl clay

45 Inscription untyped meat 21: 'Year 30 + [x], pounded meat'; no year
Probably Amun temple
NAA no. PMG342: probable Theban marl clay

46 Inscription untyped meat 22: 'Year 34, pounded for the repe[tition of the *sed*-festival] ...'
No provenance
NAA no. PMG343: probable Theban marl clay

[11] *ḥnqt* ('beer') and *srmt* ('ale') have been suggested as restorations by Hayes (*JNES* 10, 91, fig. 9) and C. A. Keller, respectively.
[12] Hayes, *JNES* 10, 92, reads 'as tribute of the heart' instead of 'pounded'.

47 Inscription untyped meat 23: '[Year x] + 1, pounded meat for the ... festival ... '
No provenance
NAA no. PMG344: probable Theban marl clay

48 Inscription untyped meat 24: ' ... prepared by the butcher Mehy';[13] no year
Amun temple, 1915 excavations
NAA no. PMG345: probable Theban marl clay

Appendix 2: Additional Theban ostraca and early Eighteenth Dynasty pottery

Asasif, tomb 703, Twelfth Dynasty
Metropolitan Museum of Art 1934–35 excavations, no. 35.3.290
Tall cylindrical jar (cf. F. W. James and P. E. McGovern, *The Late Bronze Egyptian Garrison at Beth Shan: A Study of Levels VII and VIII* (University Museum Monograph 85; Philadelphia, 1993), 176–8, fig. 97.1—Nineteenth Dynasty), Marl A2
NAA no. PMG455: probable Theban marl clay

Sankhkare Cemetery, pit 1017 (Embalmer's Cache), early Eighteenth Dynasty
Metropolitan Museum of Art 1921–22 excavations, no. 22.2.366
Large ovoid jar, Marl C (sandy)
Hieratic label reads 'natron'
NAA no. PMG447: probable Theban marl clay

Sankhkare Cemetery, pit 1017 (Embalmer's Cache), early Eighteenth Dynasty
Metropolitan Museum of Art 1921–22 excavations, no. 22.3.368
Large ovoid jar with white slip, Marl C (vitrified)
Hieratic label reads 'sawdust of W[am-wood?]'
NAA no. PMG448: probable Theban marl clay

Sheikh Abd el-Qurneh, tomb 252 (Senimen), reign of Hatshepsut, early Eighteenth Dynasty
Metropolitan Museum of Art 1934–35 excavations, no. 35.5.333b
Base of canopic jar, Marl B
NAA no. PMG450: probable Theban marl clay

Valley of the Kings, gift of Theodore M. Davis, late Eighteenth–Nineteenth Dynasty
Metropolitan Museum of Art no. 09.184.775
Ostracon not legible
Amphora, Marl D
NAA no. PMG328: probable Theban marl clay

Valley of the Kings, gift of Theodore M. Davis, late Eighteenth–Nineteenth Dynasty
Metropolitan Museum of Art no. 09.184.781
Ostracon reads ' ... fat ... '
Amphora, Marl D
NAA no. PMG329: probable Theban marl clay

Deir el-Medineh, Nineteenth Dynasty
Excavation no. 6085 C24, inventory no. 354–766
Ostracon reads '[... oil] double good and pure of Egypt, the great land of olive oil [... garden of] Ramesses II in the estate of Amun on the edge of Kamu' (Y. Koenig, *Catalogue des étiquettes de jarres hiératiques de Deir el-Médineh: Nos. 6000–6241* (CG; Cairo, 1979), 16, pl. 9)
Amphora, Marl D
NAA no. PMG327: probable Theban marl clay

[13] The inscription probably refers to meat based on comparable types: see Hayes, *JNES* 10, 91–2, 102.

In Tables 1–5, the compositions of the elemental oxides are cited as weight percentages (pct) or parts per million (ppm).

For Tables 1 and 2, the group (GRP) arithmetic mean composition has been calculated, along with one standard deviation (Std Dev—abs) and the percentage (Std Dev—pct) of the latter from the mean.

TABLE 1. *Neutron Activation Analyses of Malkata Amphoras Made of Probable Theban Marl Clay*

Sample identification	Na_2O[1] (pct)	K_2O (pct)	Rb_2O (ppm)	Cs_2O (ppm)	BaO (ppm)	Sc_2O_3 (ppm)	La_2O_3 (ppm)	CeO_2 (ppm)	Eu_2O_3 (ppm)	Lu_2O_3 (ppm)	HfO_2 (ppm)	ThO_2 (ppm)
PMG228	1.486	1.37	42.8	1.93	266	25.2	40.3	90.0	1.92	0.580	6.92	8.34
PMG248	1.211	1.05	35.7	1.38	208	22.3	38.6	85.3	1.77	0.580	5.98	7.35
PMG249	1.151	1.36	55.5	2.49	405	30.8	40.9	88.7	2.18	0.650	7.05	8.97
PMG250	1.479	0.94	34.8	1.59	328	20.9	35.2	77.6	1.61	0.510	5.96	6.90
PMG251	0.536	1.40	40.5	2.03	348	25.2	42.2	91.6	1.97	0.630	7.33	8.36
PMG252	1.057	1.24	40.2	1.75	399	24.8	41.3	89.3	1.92	0.610	6.90	7.85
PMG254	0.354	1.15	46.5	2.03	380	25.2	41.5	92.9	1.96	0.590	6.04	8.43
PMG255	0.491	1.34	47.0	2.11	352	26.9	43.0	96.2	2.10	0.630	6.49	8.85
PMG256	1.005	1.49	35.2	1.59	341	25.4	37.6	82.4	1.93	0.600	6.35	7.45
PMG257	1.279	1.72	49.0	1.67	397	26.9	38.1	83.8	1.97	0.630	8.20	7.93
PMG260	0.489	1.21	45.5	1.98	351	25.3	43.0	93.3	1.99	0.640	7.02	8.67
PMG261	0.718	0.99	39.1	1.75	283	24.8	37.8	83.8	1.88	0.580	6.89	7.45
PMG262	0.421	1.26	44.0	1.99	276	24.4	40.0	89.3	1.91	0.580	7.16	7.94
PMG263	0.650	1.17	41.8	1.86	358	22.8	38.2	82.6	1.77	0.570	6.12	7.36
PMG264	0.796	1.37	38.5	1.71	384	23.6	38.1	84.1	1.84	0.560	6.65	7.60
PMG265	0.923	1.23	42.8	1.86	336	24.6	40.2	88.5	1.87	0.590	6.34	8.04
PMG266	0.774	1.51	41.5	1.74	424	25.0	38.6	85.7	1.91	0.590	6.92	7.71
PMG267	0.918	1.59	45.3	1.88	476	24.1	38.0	87.3	1.88	0.600	5.81	7.59
PMG268	0.828	1.09	42.2	1.73	206	24.2	37.3	85.7	1.90	0.590	7.40	7.69
PMG269	0.455	1.10	48.0	2.24	350	27.4	43.0	105.0	2.15	0.640	7.38	9.10
PMG270	1.288	1.18	44.8	1.93	248	25.7	39.7	91.0	1.96	0.570	6.15	8.15
PMG271	0.448	1.10	40.6	1.97	373	25.1	41.0	91.4	1.95	0.620	7.23	8.05
PMG272	0.811	1.22	45.0	1.98	430	25.4	41.3	91.0	1.97	0.610	7.36	8.45
PMG273	0.585	1.39	45.7	2.07	308	25.2	41.0	92.5	1.97	0.600	6.65	8.28
PMG274	0.778	1.37	47.9	1.95	256	26.5	41.1	94.6	2.09	0.610	7.40	8.38
PMG275	0.381	1.17	43.4	2.01	313	24.5	40.9	91.0	1.93	0.620	6.73	8.30
PMG276	0.507	1.08	48.3	2.04	259	25.3	41.8	92.9	1.96	0.640	7.30	8.22
PMG277	0.450	1.03	39.5	1.77	246	23.3	37.5	85.5	1.80	0.570	6.52	7.93
PMG278	1.660	1.06	32.7	1.56	330	24.6	39.6	87.7	1.92	0.560	5.94	7.69
PMG326	1.336	1.77	46.1	1.62	429	26.0	31.4	70.8	1.87	0.590	7.26	6.26
PMG332	1.075	1.08	43.9	1.88	304	24.1	38.8	86.7	1.87	0.570	7.55	8.08
PMG333	0.647	1.02	44.5	1.89	208	23.6	39.3	87.0	1.88	0.580	6.90	8.14
PMG334	0.495	1.00	46.1	2.37	374	21.9	45.0	103.2	2.20	0.770	9.01	9.00
PMG335	3.395		41.5	1.86	404	24.0	39.1	86.4	1.87	0.600	6.04	7.77
PMG336	0.938	0.91	39.0	1.92	326	24.0	39.5	88.8	1.92	0.600	5.92	8.30
PMG337	0.525	1.13	42.1	2.06	299	24.0	39.5	88.2	1.84	0.570	6.68	8.43
PMG338	0.992	1.30	46.4	2.09	368	24.9	41.1	92.2	1.97	0.620	6.24	8.47
PMG339	0.762	1.11	42.6	1.85	298	23.0	37.1	83.2	1.84	0.540	6.06	7.58
PMG341	1.398	1.29	34.1	1.72	326	24.5	40.5	91.6	1.95	0.630	6.35	8.50
PMG342	0.819	1.14	37.8	2.02	495	24.5	38.3	86.0	1.86	0.620	6.61	8.26
PMG343	1.298	1.20	39.6	1.88	325	24.6	38.6	86.4	1.94	0.610	5.72	7.94
PMG344	0.554	1.28	42.2	2.08	248	23.9	39.5	90.0	1.86	0.560	6.59	8.55
PMG345	1.628	0.89	37.8	1.71	186	22.1	35.9	79.8	1.70	0.550	7.32	7.41
Number averaged	43	42	43	43	43	43	43	43	43	43	43	43
Arith. mean conc.[2]	0.925	1.22	42.5	1.90	331	24.7	39.5	88.4	1.92	0.599	6.75	8.04
	±	±	±	±	±	±	±	±	±	±	±	±
GRP std dev. (abs)[2]	0.532	0.20	4.6	0.21	72	1.6	2.4	5.9	0.11	0.040	0.67	0.56
GRP std dev. (pct)[2]	57.5%	16.4%	10.7%	11.2%	21.9%	6.6%	6.0%	6.7%	5.9%	6.7%	10.0%	7.0%

TABLE 1. *continued*

Sample identification	Ta_2O_5 (ppm)	Cr_2O_3 (ppm)	MnO (pct)	Fe_2O_3 (pct)	CoO (ppm)	NiO (ppm)	Sb_2O_3 (ppm)	U_3O_8 (ppm)	TiO_2 (pct)	ZrO_2 (ppm)	CaO (pct)	As_2O_3 (ppm)
PMG228	2.01	156	0.120	6.62	24.0	34.3	0.370	3.71	0.891	247	17.6	7.19
PMG248	2.11	145	0.120	5.85	38.1		0.300	3.66	1.033	265	19.2	8.04
PMG249	1.95	211	0.118	7.64	29.7	52.0	2.100	3.26	1.242	258	13.5	3.02
PMG250	1.72	129	0.093	5.62	19.8	46.8	0.380	3.40	0.843	216	21.5	7.46
PMG251	2.09	156	0.109	6.62	23.3	31.6	0.310	4.58	1.026	294	21.0	10.12
PMG252	2.02	152	0.143	6.61	26.4	32.7	0.300	3.45	0.982	279	17.8	9.73
PMG254	2.16	161	0.109	6.75	26.8	54.8	0.460	3.14	0.948	229	21.3	7.82
PMG255	2.15	173	0.111	7.08	25.5		0.400	3.44	0.935	279	21.0	7.62
PMG256	1.91	161	0.123	6.71	24.7	51.4	0.320	3.74	1.064	199	18.9	6.25
PMG257	2.05	175	0.159	7.06	26.1	64.1	0.360	2.77	1.233	310	13.2	4.33
PMG260	2.07	165	0.112	6.70	23.0	38.7	0.330	3.83	1.019	286	15.8	7.11
PMG261	1.95	167	0.132	6.56	24.4	50.1	0.330	3.73	1.109	281	20.1	7.23
PMG262	2.09	175	0.132	6.37	23.2	38.7	0.380	3.75	0.927	285	19.3	8.20
PMG263	1.91	150	0.109	5.89	21.2	50.0	0.350	3.54	0.998	261	19.8	7.24
PMG264	1.94	153	0.117	6.30	22.6	45.1	0.330	3.13	0.897	275	19.6	10.47
PMG265	1.96	164	0.127	6.58	23.4	33.3	0.370	4.59	0.927	272	19.8	9.10
PMG266	1.92	157	0.122	6.49	23.2	45.8	0.370	3.03	1.007	290	19.8	7.57
PMG267	1.94	153	0.142	6.44	24.2	47.9	0.430	4.35	0.865	268	23.4	10.28
PMG268	1.95	161	0.114	6.37	22.2	40.6	0.380	2.84	0.962	297	20.9	9.40
PMG269	2.36	173	0.111	7.28	28.0	79.4	0.320	4.23	1.117	341	19.7	4.91
PMG270	2.10	162	0.119	6.78	24.0	51.5	0.350	4.14	0.991	264	22.8	8.15
PMG271	2.05	157	0.106	6.75	24.5	38.4	0.400	4.08	1.052	261	20.4	8.30
PMG272	2.04	163	0.121	6.68	24.3	37.7	0.430	2.95	0.973	296	20.0	7.40
PMG273	2.13	156	0.115	6.64	24.5	47.5	0.330	4.57	0.964	234	19.8	7.94
PMG274	2.19	167	0.146	7.08	26.5		0.370	4.55	1.062	325	16.2	7.13
PMG275	2.02	154	0.136	6.70	24.4	42.2	0.420	3.92	1.084	278	24.3	8.28
PMG276	2.05	167	0.132	6.89	24.2		0.400	4.00	1.067	343	19.9	5.98
PMG277	1.96	151	0.101	6.27	21.5		0.300	4.26	0.916	278	20.5	4.62
PMG278	1.98	150	0.100	6.52	22.4	54.2	0.410	3.38	0.841	282	17.1	12.30
PMG326	1.48	156	0.131	7.05	28.1	67.5	0.280	2.69	1.228	194	12.0	3.27
PMG332	1.97	154	0.122	6.59	23.4	49.5	0.380	3.74	0.945	311	21.9	7.25
PMG333	1.95	149	0.114	6.69	23.1		0.340	3.44	0.807	272	16.7	7.35
PMG334	1.71	170	0.181	5.81	33.2	55.2	0.560	2.38	0.923	351	17.2	7.79
PMG335	2.01	147	0.144	6.65	23.3	42.4	0.260	4.05	0.547	238	18.8	7.65
PMG336	2.05	154	0.124	6.74	23.5		0.290	3.83	0.951	273	21.1	10.63
PMG337	2.06	157	0.127	6.49	22.7		0.300	3.91	0.895	245	22.1	6.85
PMG338	2.12	161	0.139	7.01	23.8		0.490	4.84	0.840	239	21.2	10.31
PMG339	1.95	151	0.120	6.37	22.3	60.6	0.340	3.28	0.793	221	22.6	7.84
PMG341	2.12	151	0.146	6.63	23.4	50.9	0.300	3.42	0.841	252	21.3	8.32
PMG342	1.99	151	0.134	6.90	24.5	38.2	0.270	3.86	0.850	227	16.8	5.63
PMG343	1.97	158	0.121	6.78	23.6		0.370	3.74	0.787	205	19.9	7.09
PMG344	2.07	151	0.115	6.64	21.6		0.420	3.31	0.791	260	19.1	10.03
PMG345	1.81	144	0.116	6.10	23.0	53.9	0.310	3.97	0.857	291	19.1	9.23
Number averaged	43	43	43	43	43	32	43	43	43	43	43	43
Arith. mean conc	2.00	159	0.124	6.61	24.6	47.7	0.400	3.69	0.954	269	19.4	7.73
	±	±	±	±	±	±	±	±	±	±	±	±
GRP std dev. (abs)	0.14	12	0.016	0.39	3.2	10.7	0.272	0.56	0.132	37	2.6	1.94
GRP std dev. (pct)	7.1%	7.8%	13.3%	5.8%	12.9%	22.3%	68.0%	15.2%	13.8%	13.6%	13.5%	25.1%

TABLE 1. *continued*

Sample identification	ZnO (ppm)	Sm_2O_3 (ppm)	Yb_2O_3 (ppm)	Tb_2O_3 (ppm)	Dy_2O_3 (ppm)	SrO (ppm)
PMG228	111	7.73	3.15	0.990	5.83	646
PMG248	88	7.64	3.25	0.960	4.74	764
PMG249	133	7.85	3.31	1.290	6.10	700
PMG250	88	6.76	2.70	0.860	4.11	1531
PMG251	101	8.04	3.25	0.980	5.52	912
PMG252	102	7.94	3.23	1.020	5.24	515
PMG254	97	7.87	3.09	0.990	5.41	682
PMG255	107	8.15	3.28		6.10	975
PMG256	102	7.66	3.27	1.020	5.50	951
PMG257	95	7.80	3.06	0.920	5.08	644
PMG260	94	8.11	3.37	1.060	5.92	659
PMG261	98	7.53	3.05		5.79	1099
PMG262	111	7.80	2.99	0.980	5.57	1112
PMG263	100	7.28	3.01	0.950	5.26	726
PMG264	99	7.40	3.13	0.940	5.30	893
PMG265	109	7.82	3.05	1.010	5.22	1052
PMG266	110	7.64	3.11	0.950	5.53	1143
PMG267	103	7.53	3.15	1.030	4.98	859
PMG268	103	7.36	3.12	0.940	5.12	877
PMG269	110	8.45	3.32	1.180	6.38	757
PMG270	104	7.80	3.24		5.15	679
PMG271	101	7.94	3.16	1.010	5.61	785
PMG272	103	8.09	3.20	1.010	6.43	871
PMG273	102	7.91	2.97		5.11	692
PMG274	104	8.15	3.25	0.990	5.53	632
PMG275	95	7.91	3.29	1.020	5.50	1390
PMG276	111	8.19	3.15	0.940	6.18	796
PMG277	98	7.26	3.01	0.950	5.12	873
PMG278	96	7.69	3.04	0.950	4.84	794
PMG326	122	6.80	2.82	0.790	5.16	479
PMG332	100	7.63	2.81	0.800	5.37	828
PMG333	103	7.72	3.02	0.890	4.82	616
PMG334	91	8.59	3.88	1.090	5.71	303
PMG335	101	7.69	3.23	0.860	3.91	869
PMG336	102	7.81	3.22	0.830	5.59	2217
PMG337	101	7.67	3.14	0.870	5.35	942
PMG338	105	8.09	3.03	0.930	5.57	630
PMG339	100	7.28	2.65	1.190	4.71	1021
PMG341	104	8.05	3.25	0.910	5.36	818
PMG342	97	7.63	3.18	0.850	5.57	822
PMG343	101	7.70	2.82	0.870	4.34	1070
PMG344	98	7.68	2.92	0.870	5.26	750
PMG345	91	7.10	2.66	0.840	4.03	860
Number averaged	43	43	43	39	43	43
Arith. mean conc	102	7.74	3.11	0.962	5.32	866
	±	±	±	±	±	±
GRP std dev. (abs)	8	0.37	0.22	0.105	0.57	307
GRP std dev	8.0%	4.8%	6.9%	10.9%	10.6%	35.5%

TABLE 2. *Neutron Activation Analyses of Additional Theban Ostraca and Early Eighteenth Dynasty Pottery Made of Probable Theban Marl Clay*

Sample identification	Na_2O (pct)	K_2O (pct)	Rb_2O (ppm)	Cs_2O (ppm)	BaO (ppm)	Sc_2O_3 (ppm)	La_2O_3 (ppm)	CeO_2 (ppm)	Eu_2O_3 (ppm)	Lu_2O_3 (ppm)	HfO_2 (ppm)	ThO_2 (ppm)
PMG327	1.01	1.16	38.0	1.72	426	24.3	35.4	77.9	1.85	0.660	6.43	7.20
PMG328	0.69	1.37	52.7	2.78	374	25.7	39.9	84.3	1.91	0.590	6.22	9.02
PMG329	0.71	0.97	37.0	1.63	217	24.3	35.0	77.5	1.78	0.510	5.36	6.85
PMG447	1.28	1.24	38.4	1.83	223	18.3	32.5	71.4	1.59	0.490	7.25	7.05
PMG448	1.51	2.36	49.1	1.66	298	28.3	36.5	82.7	2.06	0.580	8.94	8.06
PMG450	1.09	1.62	46.8	1.70	264	25.5	30.1	66.4	1.80	0.540	5.21	5.86
PMG455	1.34	1.30	39.2	2.08	311	26.3	43.7	94.8	2.17	0.630	5.74	9.63
Number averaged	7	7	7	7	7	7	7	7	7	7	7	7
Arith. mean conc	1.09	1.43	43.0	1.91	302	24.7	36.2	79.3	1.88	0.571	6.45	7.76
	±	±	±	±	±	±	±	±	±	±	±	±
GRP std dev. (abs)	0.31	0.46	6.4	0.41	77	3.1	4.5	9.2	0.19	0.062	1.30	1.31
GRP std dev. (pct)	28.6%	31.9%	14.8%	21.5%	25.5%	12.6%	12.5%	11.6%	10.2%	10.9%	20.1%	17.1%

Sample identification	Ta_2O_5 (ppm)	Cr_2O_3 (ppm)	MnO (pct)	Fe_2O_3 (pct)	CoO (ppm)	NiO (ppm)	Sb_2O_3 (ppm)	U_3O_8 (ppm)	TiO_2 (pct)	ZrO_2 (ppm)	CaO (pct)	As_2O_3 (ppm)
PMG327	1.79	160	0.125	6.45	23.6	40.7	0.350	3.48	0.86	291	19.7	6.55
PMG328	1.71	195	0.090	6.44	22.5	29.7	0.500	3.99	0.91	261	16.4	5.29
PMG329	1.81	167	0.112	6.45	22.3		0.280	3.52	0.98	225	22.2	9.27
PMG447	1.56	119	0.085	5.23	20.0			2.72	0.89	291	10.4	5.27
PMG448	1.72	207	0.116	7.39	29.0	60.6		3.14	1.06	432	9.5	
PMG450	1.46	204	0.114	6.81	26.0	72.2		3.84	1.31	258	21.8	1.98
PMG455	1.54	209	0.086	6.39	26.0	67.4		7.00	1.13	249	14.9	7.33
Number averaged	7	7	7	7	7	5	3	7	7	7	7	6
Arith. mean conc	1.66	180	0.104	6.45	24.2	54.1	0.377	3.96	1.02	287	16.4	5.95
	±	±	±	±	±	±	±	±	±	±	±	±
GRP std dev. (abs)	0.14	33	0.016	0.65	3.0	18.2	0.112	1.41	0.16	68	5.2	2.45
GRP std dev. (pct)	8.2%	18.5%	15.8%	10.0%	12.4%	33.6%	29.8%	35.6%	15.7%	23.8%	31.4%	41.1%

Sample identification	ZnO (ppm)	Sm_2O_3 (ppm)	Yb_2O_3 (ppm)	Tb_2O_3 (ppm)	Dy_2O_3 (ppm)	SrO (ppm)
PMG327	95	7.28	3.09	1.030	5.49	1357
PMG328	129	7.35	3.18	1.020	5.23	589
PMG329	96	7.03	2.55	0.950	4.82	953
PMG447	84	6.18	2.68	0.780		376
PMG448	106	7.50	3.20	1.040		575
PMG450	126	6.39	2.68	0.820		943
PMG455	131	8.56	3.25	1.090		615
Number averaged	7	7	7	7	3	7
Arith. mean conc	110	7.18	2.95	0.961	5.18	773
	±	±	±	±	±	±
GRP std dev. (abs)	19	0.78	0.30	0.118	0.34	331
GRP std dev. (pct)	17.5%	10.9%	10.1%	12.3%	6.5%	42.8%

TABLE 3. *Neutron Activation Analysis of Malkata Amphora Made of Nile Alluvial Clay*

Sample identification	Na_2O (pct)	K_2O (pct)	Rb_2O (ppm)	Cs_2O (ppm)	BaO (ppm)	Sc_2O_3 (ppm)	La_2O_3 (ppm)	CeO_2 (ppm)	Eu_2O_3 (ppm)	Lu_2O_3 (ppm)	HfO_2 (ppm)	ThO_2 (ppm)
PMG253	2.30	1.25	49.8	1.29	627	41.2	36.5	81.3	2.63	0.660	7.05	6.34

Sample identification	Ta_2O_5 (ppm)	Cr_2O_3 (ppm)	MnO (pct)	Fe_2O_3 (pct)	CoO (ppm)	NiO (ppm)	Sb_2O_3 (ppm)	U_3O_8 (ppm)	TiO_2 (pct)	ZrO_2 (ppm)	CaO (pct)	As_2O_3 (ppm)
PMG253	2.12	261	0.155	10.8	53.0	75.9	0.340	2.84	2.03	324	3.98	3.78

Sample identification	ZnO (ppm)	Sm_2O_3 (ppm)	Yb_2O_3 (ppm)	Tb_2O_3 (ppm)	Dy_2O_3 (ppm)	SrO (ppm)
PMG253	129	8.77	3.67	0.930	6.71	478

TABLE 4. *Neutron Activation Analyses of Malkata Amphoras Possibly from the Western Oases*

Sample identification	Na_2O (pct)	K_2O (pct)	Rb_2O (ppm)	Cs_2O (ppm)	BaO (ppm)	Sc_2O_3 (ppm)	La_2O_3 (ppm)	CeO_2 (ppm)	Eu_2O_3 (ppm)	Lu_2O_3 (ppm)	HfO_2 (ppm)	ThO_2 (ppm)
PMG258	1.31	1.69	23.6	1.86	253	34.7	51.3	106.9	2.57	0.790	5.86	12.3
PMG331	3.40	0.64	24.2	2.02		30.9	38.8	80.0	1.82	0.950	9.94	15.6

Sample identification	Ta_2O_5 (ppm)	Cr_2O_3 (ppm)	MnO (ppm)	Fe_2O_3 (pct)	CoO (ppm)	NiO (ppm)	Sb_2O_3 (ppm)	U_3O_8 (ppm)	TiO_2 (pct)	ZrO_2 (ppm)	CaO (pct)	As_2O_3 (ppm)
PMG258	1.83	161	212	3.33	11.67	29.9	0.530	5.81	1.15	263	18.3	2.70
PMG331	2.40	134	749	2.66	7.46		0.510	6.54	1.26	388	10.5	2.64

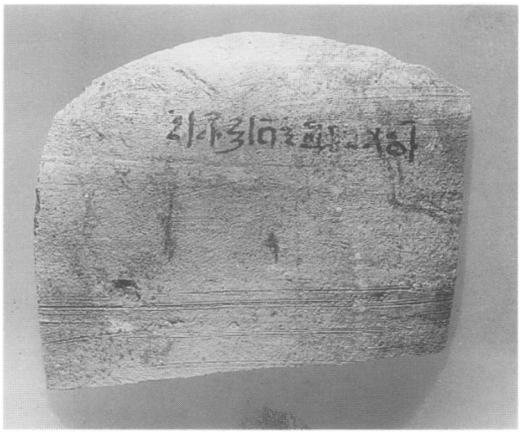
Sample identification	ZnO (ppm)	Sm_2O_3 (ppm)	Yb_2O_3 (ppm)	Tb_2O_3 (ppm)	Dy_2O_3 (ppm)	SrO (ppm)
PMG258	133.4	10.26	4.23	1.62	7.48	485
PMG331	55.6	7.88	4.88	1.18	4.74	246

TABLE 5. *Neutron Activation Analyses of Malkata Amphoras of Uncertain Origin*

Sample identification	Na_2O (pct)	K_2O (pct)	Rb_2O (ppm)	Cs_2O (ppm)	BaO (ppm)	Sc_2O_3 (ppm)	La_2O_3 (ppm)	CeO_2 (ppm)	Eu_2O_3 (ppm)	Lu_2O_3 (ppm)	HfO_2 (ppm)	ThO_2 (ppm)
PMG259	1.66	2.16	50.0	2.16	205	27.9	45.5	95.1	2.02	0.590	5.52	10.94
PMG340	1.01	0.58	33.3	1.68	94	17.5	24.4	48.8	1.43	0.350	2.87	4.07

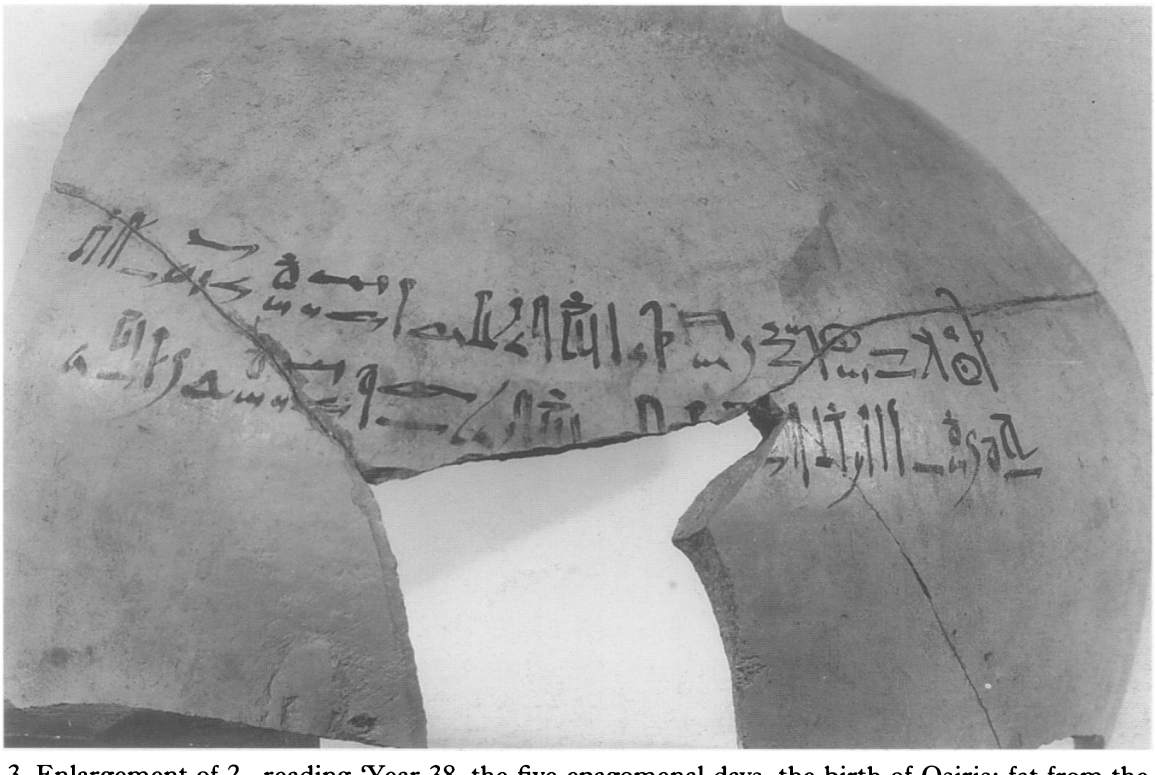
Sample identification	Ta_2O_5 (ppm)	Cr_2O_3 (ppm)	MnO (ppm)	Fe_2O_3 (pct)	CoO (ppm)	NiO (ppm)	Sb_2O_3 (ppm)	U_3O_8 (ppm)	TiO_2 (pct)	ZrO_2 (ppm)	CaO (pct)	As_2O_3 (ppm)
PMG259	1.48	217	582	6.73	19.9	44.9	0.400	4.57	0.957	192	9.7	11.2
PMG340	1.26	179	867	5.71	21.3	42.8	1.110	6.90	0.851	120	25.3	13.7

Sample identification	ZnO (ppm)	Sm_2O_3 (ppm)	Yb_2O_3 (ppm)	Tb_2O_3 (ppm)	Dy_2O_3 (ppm)	SrO (ppm)
PMG259	155	7.80	2.81	0.940	5.11	678
PMG340	69	5.36	1.86	0.580	3.85	603

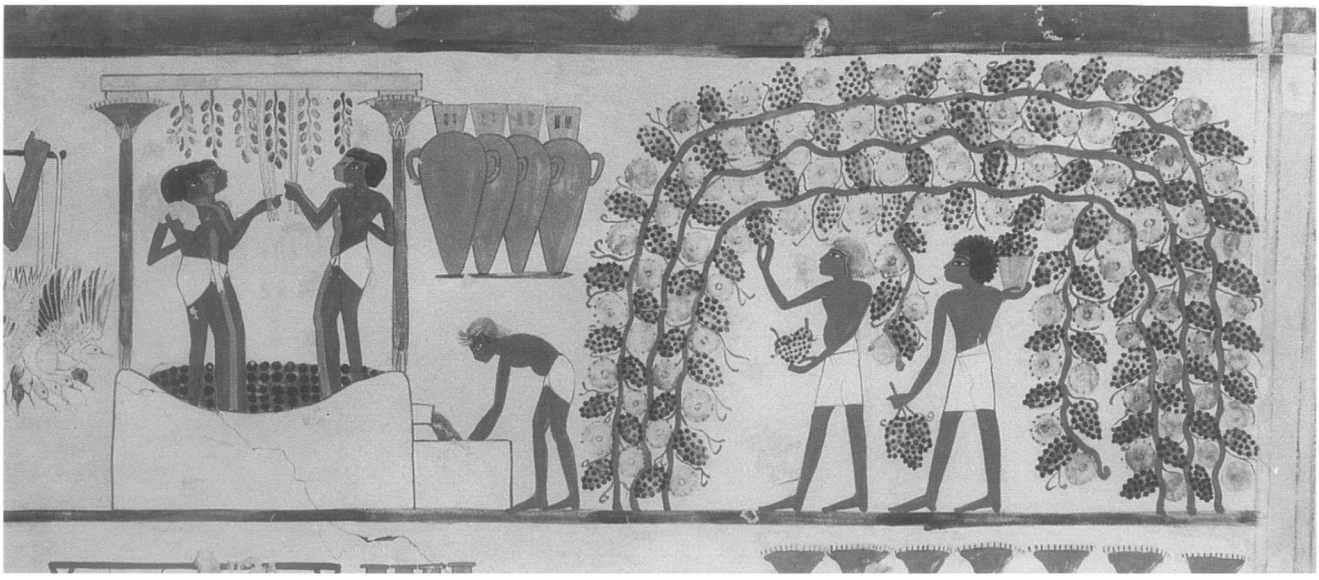


1. Hieratic wine label on a Malkata amphora shoulder fragment (Appendix 1 **13**) (*Courtesy of the Metropolitan Museum of Art, no. 17.10.9*, Rogers Fund, 1917)

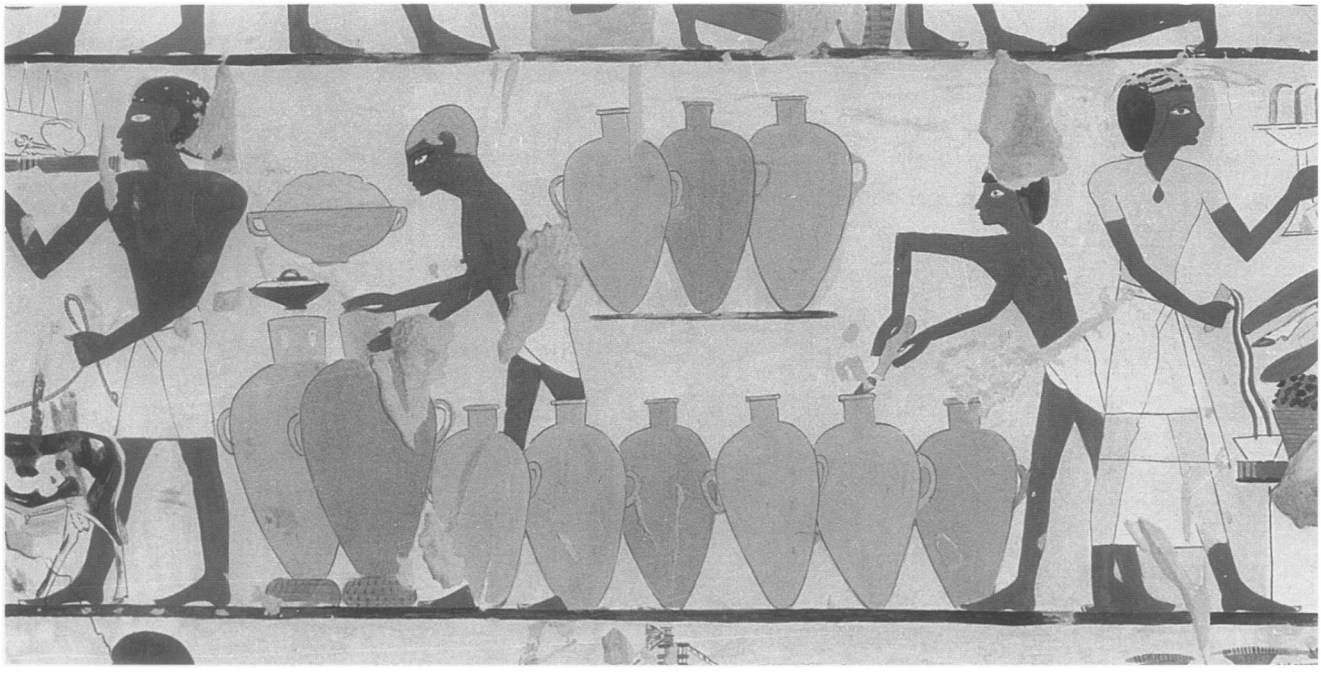
2. Upper body of Malkata amphora with hieratic fat label (*Courtesy of the Metropolitan Museum of Art, no. 17.10.2*, Rogers Fund, 1917)



3. Enlargement of 2., reading 'Year 38, the five epagomenal days, the birth of Osiris: fat from the best of the stable, a gift of His Majesty — l.p.h.! (life, prosperity, health!) — [being] an offering of the royal scribe Ahmose, prepared by the controller of fat Yuamun' (Hayes, *JNES* 10, inscription 143, fig. 3; *courtesy of the Metropolitan Museum of Art, no. 17.10.2*, Rogers Fund, 1917)



1. Vintage scene from the tomb of Nakht (TT 52), *c.* 1400 BC (after N. de G. Davies, *The Tomb of Nakht at Thebes* (New York, 1917), pl. 26; *courtesy of the Metropolitan Museum of Art, no. 15.5.19e (facsimile painting)*, Rogers Fund, 1915)



2. Clay sealing being applied to amphora mouth and neck, from the tomb of Khaemweset (TT 261), temp. Thutmosis III — Amenhotep II, fifteenth century BC. (N. M. Davies, *Ancient Egyptian Paintings*, I (Chicago, 1936), pl. xxviii; *courtesy of the Metropolitan Museum of Art, no. 30.4.121 (facsimile painting)*, Rogers Fund, 1930)

TUTANKHAMUN'S CARNELIAN SWALLOW WITH SUN DISC: PART OF A GARMENT?*

By BART R. HELLINCKX

One of the objects found on the mummy of Tutankhamun is a small gold bracelet with a carnelian swallow supporting the sun's disc. Archival documents prove unequivocally that the two pieces were not discovered together. No parallels are known for the motif of the solar swallow in combination with a bracelet, although the motif is fairly frequently attested in connection with a special type of royal garment. As the find-spot of the swallow corresponds very well with the position of the accessories of such a garment on Tutankhamun's mummy, the correctness of Carter's reconstruction is questioned. It is suggested that the swallow formed an ensemble with the other accessories of the garment, i.e. a sheet-gold belt, a beadwork apron and a beaded tail. A gold dagger in its sheath probably also belongs to this group.

AMIDST the many ornaments brought to light during the unwrapping of Tutankhamun's mummy in November 1925 is a small gold bracelet with a carnelian swallow supporting the sun's disc (pl. XV, 1).[1] The exceptional nature of this object has recently been recognized by Grimm and Patch.[2] In Grimm's wording: 'Das im Grab des Tutanchamun vorkommende Motiv der Schwalbe mit der Sonnenscheibe bildet somit eine Ausnahme, da es dort nicht in Verbindung mit einem Schurz bzw. dem Schurzgehänge, sondern als Teil eines Armreifs erscheint ...'[3] As neither of them has explained the problems surrounding this object in a satisfactory way, a new explanation will be put forward here.

*As one of the last students of the late Prof. J. Quaegebeur, I would like to dedicate this article to his memory. I am indebted to Dr J. Malek for giving me permission to consult and publish documents from the archives of the Griffith Institute, Oxford. My thanks are also due to Prof. W. Clarysse for generous support, to Prof. J. Baines for comments and suggestions and to Mr R. Reynders for the computerized drawing of Tutankhamun's apron.

[1] Carter assigned the object number (hereafter Obj. no.) 256uu to this bracelet; cf. H. Murray and M. Nuttall, *A handlist to Howard Carter's Catalogue of Objects in Tutcankhamūn's Tomb* (TTSO 1; Oxford, 1963), 9. For this object, now on display in the Cairo Museum (JE 62384; Exhib. no. 285), see H. Carter, *The Tomb of Tut-ankhamen*, II (London, 1927), 128–9, pl. 82A (4); C. Desroches-Noblecourt, *Vie et mort d'un pharaon: Toutankhamon* (Paris, 1963), 232; A. Wilkinson, *Ancient Egyptian Jewellery* (London, 1971), 106; I. E. S. Edwards, *Tutankhamun's Jewelry* (New York, 1976), nos. 14 and 19; L. V. Žabkar, 'Correlation of the Transformation Spells of the Book of the Dead and the Amulets of Tutankhamun's Mummy', in F. Geus and F. Thill (eds), *Mélanges offerts à Jean Vercoutter* (Paris, 1985), 381–3, pl. IIc; P. F. Houlihan, *The Birds of Ancient Egypt* (Warminster, 1986), 124; H. Beinlich, 'Das Totenbuch bei Tutanchamun', *GM* 102 (1988), 12; A. Grimm, 'Sonnenlauf und Vogelflug', *ZÄS* 116 (1989, 138, 141–2, fig. p. 140 ('Beleg 7'); id., 'Das Königsornat mit dem Sonnenvogel', *GM* 115 (1990), 35, pl. 5 (7); R. H. Wilkinson, *Reading Egyptian Art* (London, 1992), 93; id., *Symbol and Magic in Egyptian Art* (London, 1994), 23, pl. 4; D. C. Patch, 'A "Lower Egyptian" Costume: Its Origin, Development, and Meaning', *JARCE* 32 (1995), 93–4, 98, 100, 102, 108, fig. 2.

[2] Grimm, *ZÄS* 116, 141, and *GM* 115, 35; Patch, *JARCE* 32, 102, n. 34. Originally written as a kind of 'supplement' to Grimm's articles, this paper has been completely revised after the publication of Patch's study.

[3] *ZÄS* 116, 141.

The swallow as a component of a bracelet

The bracelet[4] consists of two semi-circular gold tubes connected at one end by a swivel joint. A large cylindrical bead of whitish stone[5] hides the swivel joint. It is flanked by two ball-beads of lapis lazuli mounted between two disc-shaped gold beads. The other end of the tubes is flat and has the form of a loop. Opposite the beads, a carnelian swallow with an eyelet at the back is attached to the loop-shaped ends of the bracelet by means of thread. A sun disc is resting upon the back of the crouching swallow. The bird is represented in profile, facing to the right. Details of the feathers of the wings and the tail, the bill and the right eye are carved in the carnelian. The diameter of the bracelet is 5.2 cm; the maximum length of the bird is 4.1 cm.

Carter[6] explained the carnelian swallow as a funerary amulet related to Spell 86 of the Book of the Dead and this has been accepted by several scholars.[7] In fact, there is very limited evidence for such an interpretation. Whereas some Book of the Dead formulae explicitly state that they have to be recited over a specific amulet,[8] Spell 86 does not even hold a clue to a connection with an amulet. Dealing with the transformation of the deceased into a swallow (*mn.t*), it belongs to a series of transformation-spells (BD 76–88) for which there is no indication whatsoever that they are related to amulets. Moreover, there are some notable differences between the swallow of Tutankhamun and the swallow depicted in the spell's vignette. The vignette usually shows a swallow on the primaeval hill; sometimes the bird is perched on a shrine and exceptionally, only the swallow is represented.[9] The king's bird, on the contrary, does not occur in combination with a mound or a shrine. The swallow in the vignette is coloured olive-green,[10] brown[11] or black,[12] whereas Tutankhamun's example is red. Most importantly, the former is always standing and does not support a sun disc, whereas the latter is a crouching swallow with the sun's disc on its back. Neglecting the true nature of the Book of the Dead formula and not taking into account the iconographic differences between the swallow of Tutankhamun and the swallow in the vignette, the traditional interpretation rests solely upon the simple fact that both object and spell are concerned with a swallow.

Wilkinson[13] and Grimm[14] noted the similarity between the swallow of Tutankhamun

[4] The following description is based chiefly upon the information of Carter's inventory card kept at the Griffith Institute in Oxford (hereafter GI). Additional information has been obtained from the excellent colour photographs in Edwards, *Jewelry*, nos. 14 and 19.

[5] According to Edwards, *Jewelry*, 34, this bead is perhaps of calcite.

[6] *Tomb* II, 128–9.

[7] Desroches-Noblecourt, *Vie et mort*, 232; Wilkinson, *Jewellery*, 106; Edwards, *Jewelry*, 37–8; Žabkar, in Geus and Thill (eds), *Mélanges Vercoutter*, 381–3; Beinlich, *GM* 102, 12; Wilkinson, *Symbol and Magic*, caption to pl. 4.

[8] Spells 29*B* (heart-amulet), 30*A–B* (heart scarab), 89 (*Ba*), 155 (*djed*-pillar), 156 (*tit*-knot), 157 (vulture), 158 (*ousekh*-collar), 159–60 (papyrus-column) and 166 (headrest).

[9] M. Saleh, *Das Totenbuch in den thebanischen Beamtengräbern des Neuen Reiches* (DAIK AV 46; Mainz, 1984), 49; H. Milde, *The Vignettes in the Book of the Dead of Neferrenpet* (Egyptologische Uitgaven 7; Leiden, 1991), 193.

[10] I. Munro, *Die Totenbuch-Handschriften der 18. Dynastie im Ägyptischen Museum Cairo* (ÄA 54; Wiesbaden, 1994), I, 83 (papyrus of Yuya).

[11] Ibid. 244, pl. 77 (papyrus Cairo 2512); the papyrus of Neferrenpet (Brussels E 5043; personal observation).

[12] Ibid. 139, 181, pls. 49, 56 (papyri of Amenhotep Cd and Maiherpri); R. O. Faulkner, *The Ancient Egyptian Book of the Dead*[2] (London, 1985), pl. on p. 86 (papyrus of Ani: BM EA 10470).

[13] *Jewellery*, 106.

[14] *ZÄS* 116, 138, 141–2; and *GM* 115, 35.

and the *sjꜣt*, a bird-amulet belonging to a particular kind of royal garment,[15] but they did not conclude that the former is an actual specimen of the latter. Because of the swallow's association with the bracelet, they chose to accept the traditional interpretation. Patch, on the other hand, designated the king's swallow as a *sjꜣt*-amulet.[16] This is supported by several facts: the king's bird and the *sjꜣt* both have the form of a crouching swallow with a sun disc on its back,[17] they are both made of red carnelian,[18] the swallow of the king has approximately the same size as the *sjꜣt*-amulets of the Middle Kingdom princesses Ita and Nubhotepti-khered[19] and this amulet type was, in all likelihood, also in use during the reign of Tutankhamun, as is indicated by some Eighteenth and Nineteenth Dynasty representations (cf. infra).

Whereas in the traditional interpretation the swallow's association with the bracelet does not present any difficulty, in the new interpretation this combination raises a question: why does a *sjꜣt*-amulet, normally associated with a particular kind of royal garment, occur in Tutankhamun's burial as a component of a bracelet? In her article devoted to the royal garment of which the *sjꜣt* is a part, Patch does not really answer this question, but the explanation she has in mind can be inferred from some incidental remarks.[20] It may be summarized as follows. The *sjꜣt* and four other accoutrements worn by the king over his kilt during religious ceremonies (belt, tail, apron and hip drape) found their way into the funerary sphere, at first only in a royal context (as in the royal dress offering list of the Pyramid Texts), but later also in the private domain (in the *frise d'objets* of the Middle Kingdom coffins).[21] Whereas in real life the five accessories formed part of a garment, in the funerary sphere they came to be regarded as separate regalia imbued with amuletic properties. In Patch's opinion the *sjꜣt* thus became a funerary amulet, powerful in itself, and, as such, it was mounted on a bracelet and placed on the royal mummy. According to her, it is possible that by the New Kingdom the old *sjꜣt*-amulet had acquired additional symbolical meaning through a connection with Spell 86 of the Book of the Dead. In order to explain the large size and unique craftsmanship of Tutankhamun's amulet, Patch considers it possible that the swallow was initially part of a true cultic garment worn by the king in his lifetime, and that it was only afterwards attached to the bracelet and positioned on the mummy for funerary purposes. In that case, the swallow is not a funerary replica specially made for the burial, but a real *sjꜣt*-amulet the king had actually worn during his life.

[15] For this amulet, cf. infra. The Egyptian term *s(j)ꜣt* is attested in the Pyramid Texts (Spell 59), the *frises d'objets* and the amulet list of the MacGregor Papyrus; see Grimm, *GM* 115, 34–5.

[16] *JARCE* 32, 93–4, 98, 100, 102, 108.

[17] Patch, *JARCE* 32, 95. In a few cases, the *sjꜣt* seems to resemble a falcon more closely than a swallow. Both bird species are also interchangeable in other contexts; see C. Graindorge-Héreil, *Le dieu Sokar à Thèbes au Nouvel Empire* (GOF IV/28; Wiesbaden, 1994), I, 22, with n. 75.

[18] All pre-Third Intermediate Period *sjꜣt*-amulets are of red carnelian and representations of the *sjꜣt* are always painted red; the post-New Kingdom examples are of gold; see Patch, *JARCE* 32, 113.

[19] Tutankhamun's swallow and the bird of Nubhotepti-khered are 4.1 cm long, while the length of Ita's *sjꜣt* is 4.25 cm; see É. Vernier, *Bijoux et orfèvreries*, (CG; Cairo, 1927), CG 53133 and 52941.

[20] *JARCE* 32, 102 (with nn. 33–4), 108.

[21] The coffin of Ma (Brussels E 5037) may be added to fig. 10 in Patch, *JARCE* 32, 105. The *frise d'objets* contains two representations of the belt combined with the apron, the hip drape and the tail (personal observation). The accompanying inscriptions call this combination '*tmꜣ(.t)* of many costly stones' and '*bs(ꜣ)w* of many costly stones'; see L. Speleers, *Recueil des inscriptions égyptiennes des Musées Royaux du Cinquantenaire à Bruxelles* (Brussels, 1923), 24.

As for Patch's suggestion that the connection with the Book of the Dead is possibly a secondary development, it should be noted that Spell 86 has an antecedent in the Coffin Texts (Spells 283 and 296),[22] so that there is no clear reason to suppose a sudden shift in the meaning of the *sjꜣt*. Although her explanation seems very plausible, the fact that the king's object is unusual in every way makes us wonder whether the king's *sjꜣt* is really a component of the bracelet.

The occurrence of a *sjꜣt* in combination with a bracelet—as in Tutankhamun's object—is unique. The manner in which the bird is attached to the bracelet is not only inelegant and without parallel, it is also impractical. The small diameter of the bracelet would have made it impossible to push the bangle with the swallow over the wrist. This means that if the king wanted to wear his bracelet, he would have had first to put on the bangle and afterwards to attach the swallow by means of a thread; if he wanted to take it off, he would have had to unfasten the thread.[23] Because of the swallow, it is not possible to swivel the parts of the bracelet. The swivel-joint thus has no function. Moreover, the presence of two quite large centre-pieces on a small and simple bangle is not merely strange; it is difficult to imagine how a bracelet with such heavily overloaded ornament could actually be worn.

Since the discovery and the publication of the object by Carter, the connection between the swallow and the bracelet has never been questioned. Yet a close examination of all extant sources reveals that what has always been taken for granted is, in fact, far from certain.

As the unwrapping of the mummy progressed, Carter took notes of what was found, and from these, and with the help of Burton's photographs, he subsequently made a series of drawings recording the position of the ornaments in the bandages on the royal mummy.[24] On one of these drawings, the position of this bracelet under discussion is indicated.[25] Contrary to the majority of the objects recorded in this drawing, the bracelet itself is not drawn. What is shown is its object number (256uu), with a dotted line pointing to a place just above the left elbow. The discovery of the bracelet and its counterpart (a bangle with six *wedjat*-eyes)[26] is described by Carter as follows: 'Enclosed in the wrappings of the arms were two quite small amulet bangles, which broke away with the decayed fabric during our examination of the mummy, but from the position in which they fell, on either side, they had evidently been placed just above the elbows.'[27] This confirms the impression gained from the drawing: the original position of the bracelet is uncertain, but Carter supposed that the object was placed just above the left elbow.

[22] A. De Buck, *The Egyptian Coffin Texts*, IV (OIP 67; Chicago, 1951), 33, 48–9; R. O. Faulkner, *The Ancient Egyptian Coffin Texts*, I (Warminster, 1973), 212–13, 220.

[23] One can avoid this difficulty by assuming that the bracelet was made for the burial only and that it was not designed to be worn in reality.

[24] T. G. H. James, *Howard Carter: The Path to Tutankhamun* (London, 1992), 346.

[25] This drawing is reproduced in anon., 'Jewels and amulets on Tutankhamun's mummy: their disposition according to the ritual of the "Book of the Dead"', *ILN* 170 (Feb. 26, 1927), fig. 6 on p. 351, and in N. Reeves, *The Complete Tutankhamun: The King, the Tomb, the Royal Treasure* (London, 1990), fig. on p. 113 (second from top, right).

[26] Obj. no. 256www. For this object (Cairo JE 62388; Exhib. no. 289), see Carter, *Tomb* II, 128, pl. 82A (5); Desroches-Noblecourt, *Vie et mort*, 232; M. Vilímková, *Chefs-d'oeuvre de l'art égyptien* (Paris, 1969), 51; C. Müller-Winkler, *Die ägyptischen Objekt-Amulette* (OBO Series Archaeologica 5; Freiburg and Göttingen, 1987), 121 (a'''). Cf. infra.

[27] *Tomb* II, 128.

Some photographs taken by Burton during the examination of the mummy show clearly the carnelian swallow at the time of its discovery (pl. XV, 2).[28] Two elements are remarkable: there is no trace of the gold bracelet, and the swallow is lying next to the left hip. In other words, these photographs picture the swallow without the bracelet and in a position a considerable distance from the elbow. Carter's excavation diary is even more explicit. In the entry of 13 November 1925, we read: 'While clearing away debris from the left side of the body, among this was found a small finely carved carnelian *Sꜣ*-bird [sic; swallow], beside the trochanter[29] which in sequence of discovery took the letters UU'.[30] The entry of 14 November contains the following passage: 'After [a] slight amount of cleaning, two further objects were disclosed, namely a gold wire amulet with small amulets attached—near the elbow of the left arm from which possibly fell the object UU discovered the day before ...'[31] On the inventory card, Carter tried to explain the anomalous position of the swallow by assuming that the bird, originally attached to the bracelet by means of thread, had fallen away from it owing to the decay of the thread. However, the fact remains that the swallow and the bracelet were neither discovered at the same time nor in the same position. The bracelet is thus a reconstruction, and, in view of what has been said, a very doubtful one.

If the swallow is not a component of the bracelet, a new question presents itself: is Tutankhamun's *sjꜣt* an independent amulet or does it belong to one or other object? Only Late and Ptolemaic Period survivals of the *sjꜣt* occur as independent amulets placed within the wrappings of the mummy.[32] As they are cut from thin sheet-gold and do not display a sun disc, they do not have much in common with Tutankhamun's example. Moreover, the presence of an eyelet at the back of the king's swallow strongly suggests that it was part of some object. Since all pre-Late Period *sjꜣt*-amulets are a part of a particular kind of royal garment, one would expect that this also applies to Tutankhamun's specimen.

The swallow as part of a garment

A number of representations from the Early Dynastic Period to the Middle Kingdom show a garment worn by the king consisting of five accoutrements over the pleated kilt of a single-strap tunic: a belt, a ceremonial bull's tail, an apron, a hip drape and a *sjꜣt*.[33] The belt and the tail are accessories that were combined with several types of royal kilts,

[28] For general views of the same stage in the unwrapping, see F. F. Leek, *The Human Remains from the Tomb of Tutʿankhamūn* (TTSO 5; Oxford, 1972), pls. iv (right), xiii. Another general view is unpublished: GI, neg. 2002.

[29] The so-called 'turner', a prominence at the upper end of the thigh bone.

[30] GI, notebook no. 3.

[31] Ibid.

[32] Patch, *JARCE* 32, 102, n. 37 and fig. 8. See also M. Châban, 'Fouilles dans la nécropole de Saqqarah', *ASAE* 19 (1920), 214; C. R. Williams, *The New York Historical Society, Catalogue of Egyptian Antiquities, numbers 1–160: Gold and Silver Jewelry and Related Objects* (New York, 1924), no. 97; H. Gauthier, 'Une tombe d'époque Saïte à Héliopolis', *ASAE* 27 (1927), fig. 4. The *sjꜣt* is also included among the amulets of the 'Boston die' and perhaps also among those of the 'Kennard board'; see Williams, *Catalogue*, 168 and G. Möller, 'Musterbrett eines Amulett-Fabrikanten', *Amtliche Berichte aus den Königlichen Kunstsammlungen*, 34/2 (1912), fig. 7.

[33] The information on the pre-New Kingdom garment is based chiefly upon Patch, *JARCE* 32, 94–6, 103–7.

skirts and aprons;[34] the distinctive elements of this garment are the apron, the hip drape and the *sjꜣt*. The rectangular apron, which hangs from the belt, centered below the buckle, is made from closely aligned strings comprising four types of beads. The uppermost bead of each strand is a papyrus umbel. It is followed by long truncated

TABLE 1. *New Kingdom and Late Period representations of the king wearing the 'Lower Egyptian garment'*

King	Headdress	King	Headdress
(1) Amenhotep I	double crown[35]	(11) Iuput II	cap crown[45]
(2) Tuthmosis II	red crown (?)[36]	(12) Shabako	red crown (?)[46]
(3) Tuthmosis III	red crown[37]	(13) Shabako	destroyed[47]
(4) Amenhotep III	*nemes*[38]	(14) Taharqa	destroyed[48]
(5) Amenhotep III	*ibes* and diadem[39]	(15) Taharqa	destroyed[49]
(6) Amenhotep III	red crown[40]	(16) Taharqa	destroyed[50]
(7) Amenhotep III	blue crown (fig. 1)[41]	(17) Taharqa	destroyed[51]
(8) Amenhotep III	*nemes* (fig. 2)[42]	(18) Taharqa	destroyed[52]
(9) Sethos I	*khat* (fig. 3)[43]	(19) Amasis	destroyed[53]
(10) Sethos I	wig (fig. 4)[44]		

[34] For the belt as represented on royal sculpture, see H. G. Evers, *Staat aus dem Stein* (Munich, 1929), II, § 226–51, and R. Tefnin, *La statuaire d'Hatshepsout* (MonAeg 4; Brussels, 1979), 13, 19, 79, 92, fig. 2a. For the tail, see G. Jéquier, 'La queue de taureau insigne des rois d'Égypte', *BIFAO* 15 (1918), 165–8; id., *Les frises d'objets des sarcophages du Moyen Empire* (MIFAO 47; Cairo, 1921), 110–11; W. Helck, 'Tierschwanz', *LÄ* VI, 591; E. Staehelin, 'Ornat', *LÄ* IV, 615, 618 (n. 34).

[35] PM II², 74 (foundation ceremony); C. Graindorge and P. Martinez, 'Karnak avant Karnak', *BSFE* 115 (1989), 43, fig. 6.

[36] L. Gabolde, 'La "cour de fêtes" de Thoutmosis II à Karnak', in *Cahiers de Karnak*, IX (Paris, 1993), 42, pl. xv.

[37] PM II², 349 (21e); E. Naville, *The Temple of Deir el Bahari*, III (MEEF 16; London, 1898), pl. lxvi (middle).

[38] PM II², 329 (171: I, 3); H. Brunner, *Die südlichen Räume des Tempels von Luxor* (DAIK AV 18; Mainz am Rhein, 1977), pl. 44 (scene 43).

[39] PM II², 330 (171: II, 4); Brunner, *Südlichen Räume*, pl. 88 (scene 54).

[40] S. Bickel. *Ein Tor Amenhotep III.* (BÄBA 16; in press).

[41] H. Jaritz and S. Bickel, 'Une porte monumentale d'Amenhotep III'. *BIFAO* 94 (1994), pl. on p. 483 (A); Bickel, *Tor Amenhotep III.*

[42] Jaritz and Bickel, *BIFAO* 94, pl. on p. 485 (C, lower); Bickel, *Tor Amenhotep III.*

[43] PM VI, 19–20 (183–4); A. M. Calverley and M. F. Broome, *The Temple of King Sethos I at Abydos*, III—*The Osiris Complex* (London and Chicago, 1938), pls. 8, 12 (upper).

[44] PM VI, 20 (185); Calverley and Broome, *The Temple of King Sethos I at Abydos* III, pl. 12.

[45] A plaque Brooklyn 59.17, provenance unknown; see R. Fazzini (ed.), *Ancient Egyptian Art in the Brooklyn Museum* (New York, 1989), no. 69.

[46] PM II², 305 (15f: III); K. Myśliwiec, *Royal Portraiture of the Dynasties XXI–XXX* (Mainz am Rhein, 1988), pl. xxixa.

[47] PM II², 305 (15c: III); Myśliwiec, *Royal Portraiture*, pl. xxixb.

[48] PM II², 220 (19–20: 1); R. A. Parker et al., *The Edifice of Taharqa by the Sacred Lake of Karnak* (Brown Egyptological Studies 8; Providence, 1979), pl. 7A.

[49] PM II², 220 (19–20: 2); Parker et al., *Edifice of Taharqa*, pl. 7B.

[50] PM II², 220 (19–20: 3); Parker et al., *Edifice of Taharqa*, pl. 8.

[51] PM II², 219 (7); Parker et al., *Edifice of Taharqa*, pl. 17.

[52] PM VII, 190 (67); M. F. L. Macadam, *The Temples of Kawa*, II (London, 1955), pl. xxiib.

[53] A relief fragment (London, UC 16537), provenance unknown; see H. M. Stewart, *Egyptian Stelae, Reliefs and Paintings from the Petrie Collection*, III (Warminster, 1983), 17 (no. 58), pl. 26.

bicones alternating with quadrifoil beads. Drop-shaped pendants imitating lotus petals form a kind of fringe at the bottom of the apron. The hip drape, shorter by half and slung over the left hip of the king, is a network of diamond-shaped or hexagonal links comprising long truncated bicones and ball-beads. The *sjꜣt*-amulet is attached to the front of the hip drape, near its lower border. On the basis of the occurrence of the papyrus-umbel beads in the apron and the garment's consistent combination with the red crown of Lower Egypt, Patch calls this ensemble the 'Lower Egyptian garment'.

The body of Senebtisi, a prominent lady of the late Twelfth or early Thirteenth Dynasty, and the mummies of the Middle Kingdom princesses Ita, Neferuptah and Nubhotepti-khered were adorned with the five accessories of this garment. This indicates that the ensemble, originally only worn by the king, was also fashioned as funerary equipment for royal and private persons by the Twelfth Dynasty.

According to Patch, five New Kingdom representations depict the king attired in the 'Lower Egyptian garment' (see Table 1 (6)–(10); figs. 1–4).[54] That so few post-Middle Kingdom representations of the pharaoh wearing this garment are preserved is probably the result of a new decorative technique. A number of decorated blocks from Amenhotep III's mortuary temple, recently discovered at the Merenptah temple at Qurna, show that some of the garment's accessories were sometimes only painted instead of being first executed in relief. The king is depicted three times wearing the garment. Only in one instance ((7); fig. 1) are the three distinctive elements carved in raised relief and therefore sufficiently preserved to be recognized. In the two other cases ((6) and (8); fig. 2) only the apron is in relief. Whereas the apron is for the greater part still visible, the hip drape has partly become indistinct and the *sjꜣt* has completely faded away.[55] If one accepts that the presence of two accessories is sufficient to distinguish depictions of the 'Lower Egyptian garment' from those of other royal dresses, a more substantial number of post-Middle Kingdom representations can be identified (Table 1). Generally only the outlines of the apron and the hip drape are visible ((1)–(5), (12)–(19)). In four instances the *sjꜣt* has been preserved ((1), (7), (9)–(10); figs. 1, 3, 4).

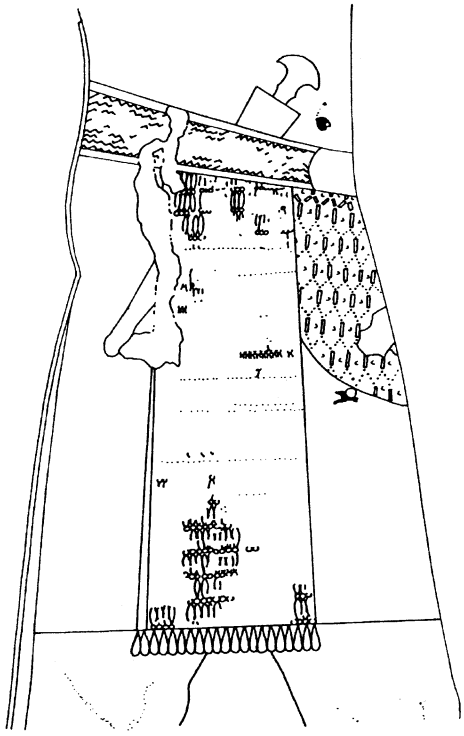
Only four representations ((2)–(3), (6), (12)) show the king wearing the archaic tunic and the red crown. In most cases he is depicted with the tunic ((7–(8), (11), (13), (16), (18)) or a knee-length kilt ((1), (4)–(5), (9)–(10), (14), (17?), (19?)) combined with one or other headdress. Almost every type of royal head-gear seems to occur in combination with the garment (Table 1). In one example ((15)) the king is wearing the corselet formed by two solar falcons with overlapping wings. By the early New Kingdom the archaic tunic and the red crown were thus no longer essential parts of the outfit. Another novelty is the depiction of a dagger tucked under the belt ((1), (6)–(7); fig. 1). The most important innovation, however, concerns the beadwork composition of the apron and the hip drape. In post-Middle Kingdom representations the apron does not display papyrus and quadrifoil beads. The strands of Amenhotep III's aprons ((6)–(8); figs. 1–2) are composed of long truncated bicones alternating with ball-beads.[56] In the examples of Sethos I the strings of the apron consist of elongated drop-beads separated by either two

[54] Patch, *JARCE* 32, 98 with fig. 5 (cat. nos. 30–1), 101, 116.

[55] I am grateful to Dr S. Bickel for giving me this information and for providing me with photographs and drawings of the three representations.

[56] An apron with a similar beadwork pattern occurs in the *frise d'objets* of the coffin of Sawadjet; see R. Engelbach, *Riqqeh and Memphis*, VI (BSAE 26; London, 1915), pl. 23.

((10); fig. 4) or three ball-beads ((9); fig. 3).[57] Just like the strings of the pre-New Kingdom aprons, those of the later periods end in a drop-shaped pendant imitiating a lotus petal ((6)–(7), (9)–(10), (14)–(16), (19); figs. 1, 3, 4). According to one well-preserved representation of Amenhotep III ((7); fig. 1), the hexagonal links of the hip drape comprise cylinders and ball-beads, with a small disc filling in every alternate hexagon in the net. Such discs, also visible in a representation of Sethos I ((9); fig. 3), did not occur in the earlier periods.[58] The depiction of king Iuput II ((11)) is exceptional, as instead of displaying beadwork, the apron and hip drape look like pleated textile; the former is decorated with vertical lines, the latter with oblique lines. As Iuput II was contemporary with the early Twenty-fifth Dynasty, a period characterized by an archaizing style of art, the king is perhaps depicted with a garment that was no longer actually worn. Possibly the artist did not exactly know what he was copying and this resulted in



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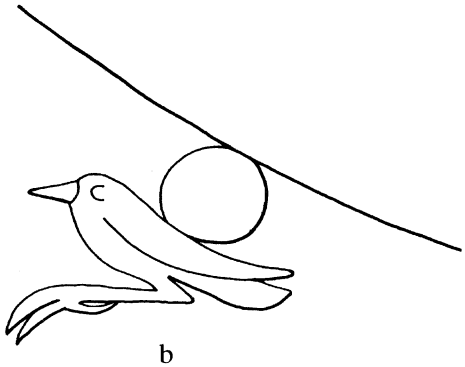


b

FIG. 1 a. Detail of a relief block from Amenhotep III's mortuary temple.
FIG. 1 b. *sjꜣt*-amulet attached to the lower border of the hip drape (both drawings by the author after a drawing by W. Schenck to appear in Bickel, *Tor Amenhotep III*; reproduced by permission).

[57] For actual examples of elongated drop-beads, see e.g. P. P. Riesterer, *Das Ägyptische Museum Kairo*, I[3] (Bern, 1970), pls. 22 (pectoral of Meret) and 45 (pectorals of Hatiay).

[58] Such hip drapes were probably constructed in a similar way as a 'bag-tunic' from Tutankhamun's tomb (Obj. no. 21d). This tunic is a garment of cloth covered with a network of faience beads; a gold disc is sewn on to the fabric in the centre of every alternate square in the net; see A. Kouwenhoven and G. Vogelsang-Eastwood, 'Les vêtements de Toutankhamon', *Archéologia* 312 (1995), 24, pl. on p. 23.

an incorrect and—as the *sjꜣt* is lacking—perhaps also an incomplete rendering of the garment. As none of the Kushite Period representations ((12)–(19)) displays a *sjꜣt*-amulet, this raises an important question: are they likewise incomplete copies of older models or did they originally include a painted *sjꜣt*? So far, there is no proof that such a painting was once present. This means that the latest certain attestation of a *sjꜣt* in combination with a garment dates from the Twenty-second Dynasty: on the mummy of Shoshenk II in his tomb in Tanis was placed a *sjꜣt*-amulet and a belt with an apron.[59]

The representations of Amenhotep III and Sethos I are crucial. They not only prove that by the time of Tutankhamun the connection between the *sjꜣt* and the royal garment had not yet been lost, but they also give us an idea of the kind of accessories that should be present on Tutankhamun's mummy if his *sjꜣt*-amulet really belongs to a 'Lower Egyptian garment'. In fact, the royal mummy was adorned with all but one of the garment's accessories: a beadwork apron, a sheet-gold belt, a beaded tail and a *sjꜣt*-amulet. Just as Amenhotep III is depicted wearing a dagger in his belt ((6)–(7); fig. 1), a gold dagger, housed in a gold sheath, was tucked under the belt of Tutankhamun.[60]

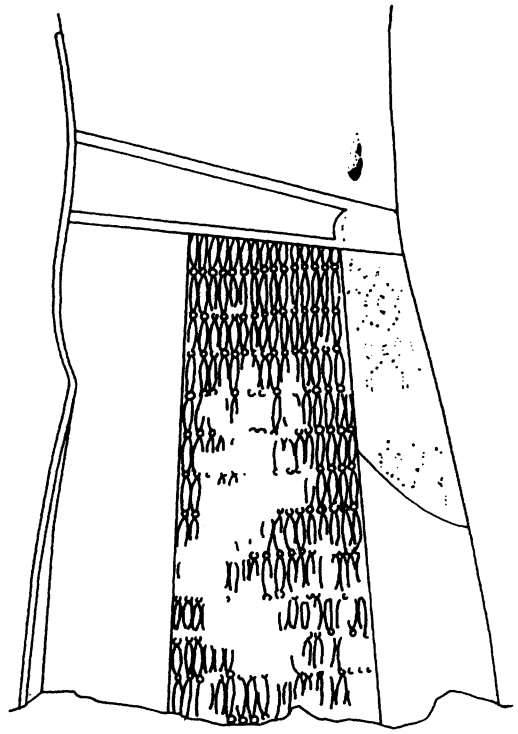


FIG. 2. Detail of a relief block from Amenhotep III's mortuary temple (drawing by the author after a drawing by W. Schenck to appear in Bickel, *Tor Amenhotep III*; reproduced by permission).

[59] P. Montet, 'La nécropole des rois tanites', *Kêmi* 9 (1942), 73–4, pls. xxii (nos. 236 and 242); id., *La nécropole royale de Tanis*, II (Paris, 1951), 41, pls. 31–2.

[60] It was lying in a diagonal position, the dagger's haft to the right of the umbilicus, the point of the sheath over the upper part of the left thigh. For these two objects (Obj. no. 256dd), on display in the Cairo Museum (JE 61584, Exhib. no. 225): see e.g. I. E. S. Edwards et al., *Treasures of Tutankhamun* (exhibition catalogue; New York, 1976), no. 20 (with bibliography).

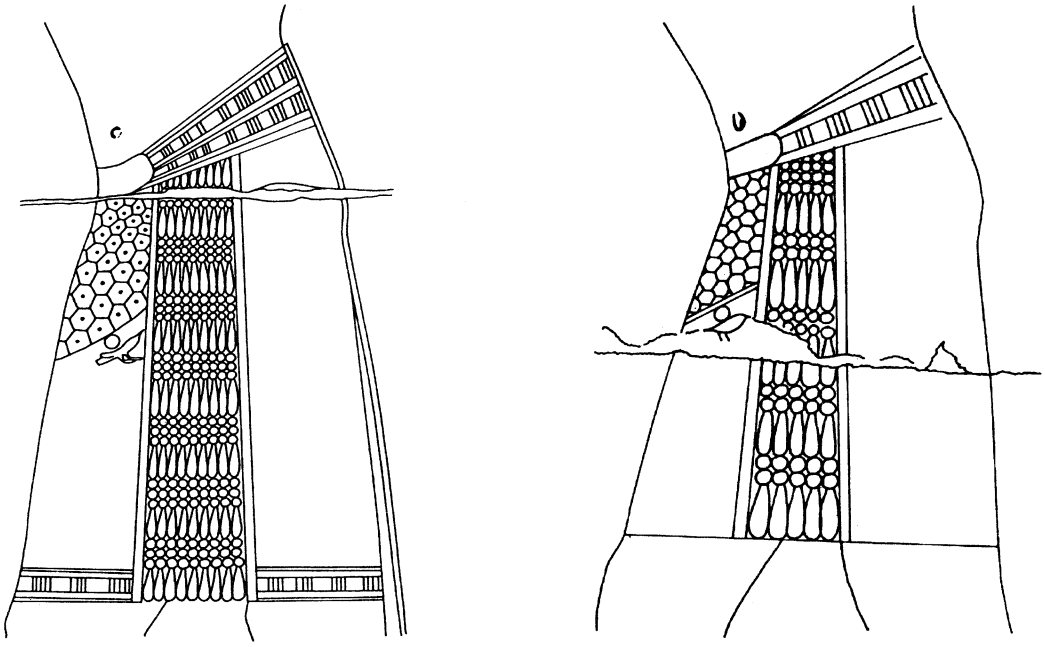


FIG. 3. Detail of a relief in the Osiris complex of the temple of Sethos I at Abydos (drawing by the author after Calverley and Broome, *The Temple of King Sethos I* III, pl. 8; reproduced by permission of the EES).
FIG. 4. Detail of a relief in the Osiris complex of the temple of Sethos I at Abydos (drawing by the author after Calverley and Broome, *The Temple of King Sethos I* III, pl. 12; reproduced by permission of the EES).

Apart from the well-publicized dagger and its sheath, these interesting objects have been unduly neglected. They will be described in due course, starting with the best-documented object, the belt (fig. 5).[61]

The sheet-gold belt[62] was encircling the waist of the mummy, slightly higher on the right side than on the left side (see fig. 7). It widens towards the back.[63] On its front, it has a chased decoration in imitiation of a disc-bead composition:[64] a central row of diamonds on a zigzag-background, bordered by a double horizontal line. In the centre of the front there is an incised cartouche containing the king's throne name (Nebkheperura) and the epithet 'Image of Ra'. On the back, the centre is chased with the formula 'Protection and life is behind the Lord of the Two Lands'.[65] Two projecting tubes for the fastening of a tail partly cover the word 'behind'. At the back of the name-buckle

[61] Obj. no. 256ee. For this object, likewise on display in the Cairo Museum (JE 60676; Exhib. no. 335), see Carter, *Tomb* II, 131, 133–4, pls. 34A–C; Wilkinson, *Jewellery*, 135, pl. xlviiib; H. Beinlich and M. Saleh, *Corpus der hieroglyphischen Inschriften aus dem Grab des Tutanchamun* (Oxford, 1989), 89.

[62] The description is based chiefly upon the information of Carter's inventory card kept at the Griffith Institute. Additional information has been obtained from the photographs taken by Burton.

[63] The minimum width of the belt (in the centre of the front) is 1.3 cm; its maximum width (in the centre of the back) is 2.5 cm. The total length is 77.6 cm.

[64] Cf. K. Bosse-Griffiths, 'The Use of Disc-beads in Egyptian Bead-compositions', *JEA* 61 (1975), 116, 124.

[65] In many representations, a similar 'protection formula' is written behind the king, often at the level of the belt; see e.g. J. Leclant (ed.), *L'empire des conquérants* (Paris, 1979), pls. 53, 59, 88, 106, 112–13. As one cannot see an enemy attacking from behind, the back is the most vulnerable part of the human body and it needs special protection; see Jéquier, *Frises d'objets*, 70–1.

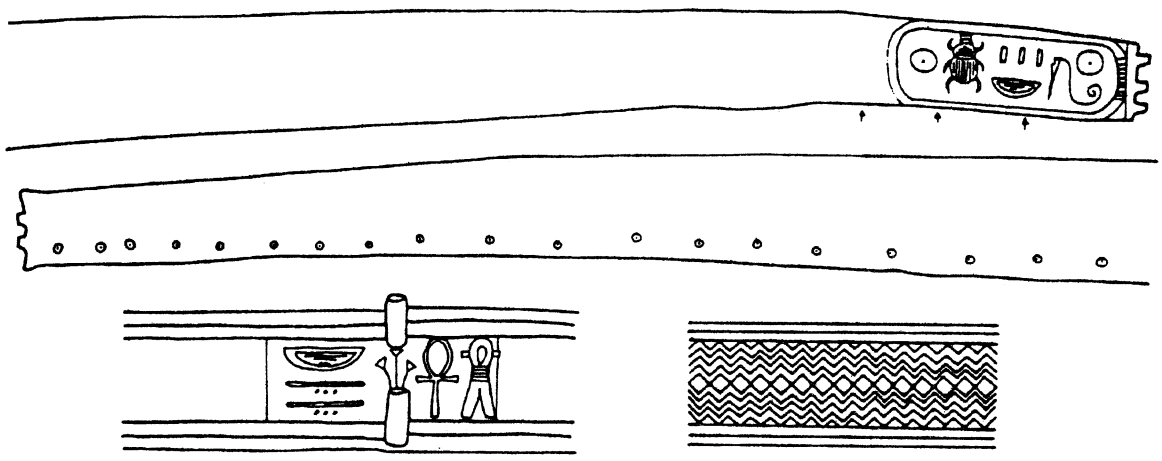


FIG. 5. Tutankhamun's sheet-gold belt (drawing by the author after sketches by H. Carter; reproduced by permission of the Griffith Institute, Oxford).

there are three eyelets for the attachment of an apron[66] and to the wearer's left the lower edge of the belt has nineteen perforations. The end with the cartouche is provided with three projecting eyelets, the other end has two such eyelets. When the ends are brought together the eyelets form a single line and the belt can be closed by pushing a removable gold pin through them. At the time of the discovery, the ends of the belt were still fastened by this pin (cf. pl. XVI).[67] Beadwork belts with a similar zigzag and diamond pattern were found, in conjunction with a *sjꜣt*, on the above-mentioned Middle Kingdom mummies.[68]

That a beadwork apron of the type worn by Amenhotep III in artistic representations was found on Tutankhamun's mummy is little known. The reasons are threefold: the object is only cursorily described in Carter's book,[69] a photograph of it has not yet been published and, unlike the greater part of the ornaments that were found on the royal mummy, it is not on display in the Egyptian Museum of Cairo. Its present whereabouts are unknown (presumably it is stored in one of the Tutankhamun magazines of the Cairo Museum). Unfortunately, the information provided by the unpublished records kept in the Carter archive of the Griffith Institute in Oxford is rather limited. In his archaeological diary, Carter described the object as it was brought to light: 'BB: A mesh of gold and other beads of various forms lying over the pubis. These were so mixed up and their

[66] On fig. 5 the position of these eyelets is indicated by small arrows.

[67] GI, notebook no. 3: entry of 12 November 1925.

[68] The best preserved and best published belts come from the mummies of Senebtisi and Neferuptah; see A. C. Mace and H. E. Winlock, *The Tomb of Senebtisi at Lisht* (MMA Egyptian Expedition 1; New York, 1916), 70–2, pls. xxvii, xxxi (C); N. Farag and Z. Iskander, *The Discovery of Neferwptah* (Cairo, 1971), 73–6, pls. xliii, liii. For similar beadwork belts from burials that did not include a *sjꜣt*, see Wilkinson, *Jewellery*, 46, fig. 31 (Old Kingdom), 79 (Middle Kingdom). As appears from the impressions in the resin on the back of the sacrum, the mummy of Amenhotep II was originally—before the disturbance by tomb robbers—adorned with a belt which displayed exactly the same diamond and zigzag pattern as Tutankhamun's example; see G. E. Smith, *The Royal Mummies* (CG; Cairo, 1912), 38, diagram 8.

[69] *Tomb* II, 133–4.

strings [so] decayed [that] for the moment it is not possible to recognize their significance; with these beads were further portions of [the *ousekh*-collar] O.'[70] Some photographs taken by Burton during the unwrapping of the mummy illustrate the disordered state of this group of objects (pl. XVI).[71] Carter's index card gives information about only one of the beadwork objects, an *ousekh*-collar with semicircular shoulder-pieces (Obj. no. 256bb.2).[72] Concerning the other object (Obj. no. 256bb.1), it merely states: 'Group of beadwork. Not yet completed'. A tentative reconstruction, based upon the brief description in Carter's publication and some photographs of the object *in situ*, is proposed here (fig. 6).

The apron consists of twenty closely-aligned strings of faience and glass beads. The outer strands are composed of short cylinders. The inner strings comprise either ring-beads or long truncated bicones alternating with ball-beads. After two or three long truncated bicones, a spacer bar of gold, imitating twenty horizontally-positioned rings, keeps the strands and the beads in their position and gives the apron some stability. The apron is provided with at least six such spacers. On the bottom edge there is a hem of drop-shaped pendants imitating lotus petals. These pendants are of gold, probably inlaid with a semi-precious stone. The apron hung down from the centre of the belt. Positioned between the thighs, it extended from the pubic area to just above the knees.[73]

As there appears to be some confusion about the number of belts and tails that were found on the royal mummy,[74] it should be stressed that Tutankhamun's mummy was adorned with the accessories of two different garments and that both garments included a belt, a tail and an apron.[75] Carter did not specify which tail belongs to which ensemble, but a photograph taken during the investigation of the mummy (pl. XVII, 1) may enable us to settle the question.

The upper part of each tail is a string of alternating gold and dark blue glass cylindrical beads. Originally this string was attached to the back of the corresponding belt, but, owing to the decay of the thread, the connection with the belt has been lost, and Carter found the tails lying on the bottom of the gold coffin. In view of the fact that they were

[70] GI, notebook no. 3: entry of 12 November 1925. Carter continues: 'To reconstruct these beadwork objects will be a difficult, if not impossible task—not merely on account of the threads which have decayed, but also the jumbled manner in which they occurred. They were treated with paraffin wax with the hope of preserving some kind of record of their order of threading.'

[71] For a general view of the same stage in the unwrapping, see Leek, *Human Remains*, pl. iii (right). Another general view is unpublished: GI, neg. 2000.

[72] This collar is not mentioned by Carter in his survey of the objects found on the royal mummy (*Tomb* II, ch. 7). Its present location is unknown. A similar *ousekh*-collar, which probably comes from Tutankhamun's tomb, is in the Brooklyn Museum (40.522); see R. Fazzini, *Images for Eternity. Egyptian Art from Berkeley and Brooklyn* (exhibition catalogue; San Francisco and New York, 1975), no. 73.

[73] This object is indicated on a drawing by Carter: see anon., *ILN* 170, fig. 2 on p. 350, and Reeves, *Tutankhamun*, fig. on p. 113 (lower right).

[74] Several authors state that the ornaments of the mummy include one belt and one tail, whereas two examples of each were found. See Murray and Nuttall, *A handlist*, 10 (Obj. no. 256eee); Wilkinson, *Jewellery*, 135; C. Andrews, *Ancient Egyptian Jewellery* (London, 1990), 30, 143; Reeves, *Tutankhamun*, 112 (Obj. no. 256eee), 154; M. J. Raven, 'Sieraden en amuletten', in G. Vogelsang-Eastwood, *De kleren van de farao* (Amsterdam, 1994), 122.

[75] For the belt of the other garment (Cairo JE 60677; Obj. no. 2561; Exhib. no. 334), see Carter, *Tomb* II, 130–1, 133–5, pls. 34A–C (upper); Wilkinson, *Jewellery*, 135, pl. xlviiiA; Beinlich and Saleh, *Corpus*, 88. For the second apron (JE 60685; Obj. no. 256j; Exhib. no. 270), see Carter, *Tomb* II, 131, 134–5, pls. 83B. The tail belonging to the garment under discussion is not on display in the Cairo Museum but the other (JE 62633; Exhib. no. 1211) is.

'embedded, like a fossil in its matrix, in the thick hardened mass of congealed unguents that was poured over the mummy',[76] their findspot was, in all probability, still in accordance with the original position of the fastening device on the back of the corresponding belt. Contrary to the front fastening of the belt described above, the name-plate

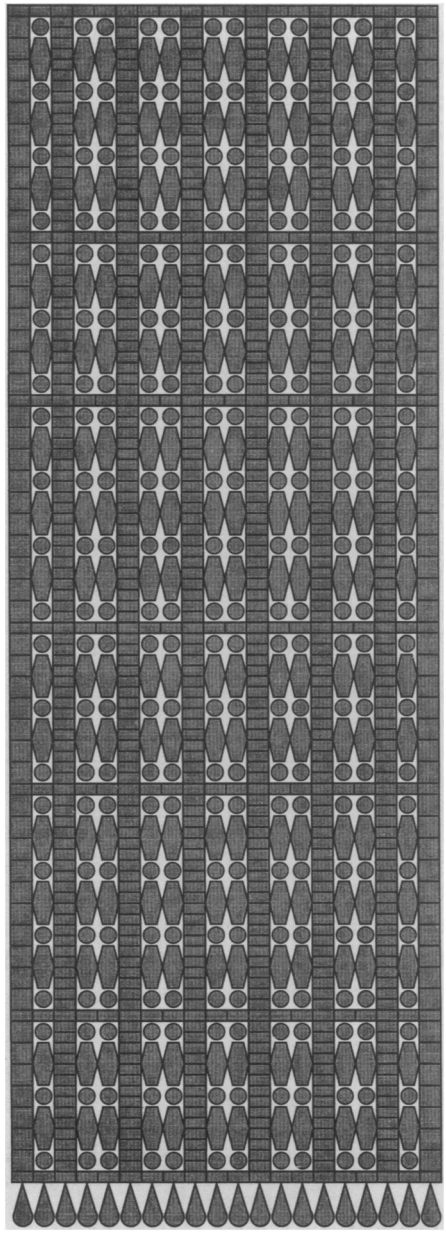


FIG. 6. Tentative reconstruction of Tutankhamun's beadwork apron (drawing by R. Reynders).

[76] Carter, *Tomb* II, 133.

of the second belt was not completely in the centre of the king's abdomen (i.e. precisely below the umbilicus), but slightly to the left. The fastening device for the tail was thus probably somewhat to the right. As appears from the photograph of the two objects *in situ*, the upper end of one tail is lying slightly more on the right side than its counterpart. This is probably the tail that belongs to the second ensemble (Obj. no. 256eee.1). The tail, the upper end of which is lying precisely in the centre of the coffin, is in all likelihood the one that matches the belt and the apron described above (Obj. no. 256eee.2). This view is reinforced by another detail visible on the photograph. The wrappings below the body were completely decomposed, but as both tails cross each other on one point, it is clear that the uppermost originally belonged to a layer closer to the body than the other. The belt and the apron of the garment under discussion were indeed found between the inner layers, whereas the accessories of the other ensemble were discovered in one of the outer layers. Further verification of this view is found in the manner in which the tuft of the tails is constructed. The tuft of the second ensemble consists of an open goldwork cage inlaid with semi-cylindrical pieces of dark blue glass. This echoes the construction of the second apron: a rigid gold apron base inlaid with polychrome glass. The construction of the tuft of the other tail, a core of fibre covered with minute disc-beads of faience,[77] mirrors the beadwork composition of the corresponding apron. There is still another important argument in favour of this identification: Tutankhamun's beadwork tail is constructed in a similar way to the tails of the Middle Kingdom ensembles that include a *sjꜣt*.[78] As the inventory card only contains information about the tail of the other ensemble, it is not possible to give a more detailed description of the beadwork tail. The few data cited above are based upon two brief entries in Carter's excavation diary,[79] the '*in situ* photograph' taken by Burton and a one-sentence-description in Carter's Tutankhamun publication.[80]

Having ascertained that Tutankhamun's mummy was adorned with four out of five accessories of the 'Lower Egyptian garment', we must now reconsider the position of the swallow on the king's mummy. The swallow was found on the left side of the mummy, in the vicinity of the abdomen (pl. XV, 2). This position calls to mind the find-spot of some Middle Kingdom *sjꜣt*-amulets. One example was discovered near the waist of Senebtisi.[81] The amulets of three Middle Kingdom princesses were found in a similar position: Ita's *sjꜣt* was placed 'au flanc gauche, près, sans doute, de l'incision faite par le tarischeute',[82] the specimen of Neferuptah was lying 'on the left side roughly in the position originally occupied by the abdomen of the mummy'[83] and the pendant of Nubhotepti-khered was located 'à gauche à la hauteur de la ceinture'.[84] All these amulets, including Tutankhamun's, were precisely placed where the explanatory labels of the *frise*

[77] On the technique of disc-bead composition, see Bosse-Griffiths, *JEA* 61, 114–24, pls. xvii–xxi, and G. B. Johnson, 'Seeking Queen Nefertiti's tall blue crown', *Amarna Letters* 1 (1991), 50–61.

[78] The best preserved and best published tail was found on the mummy of Senebtisi: see Mace and Winlock, *Senebtisi*, 70–1, fig. 34; C. Aldred, *Jewels of the Pharaohs* (London, 1971), 178, pl. 9 (colour photograph).

[79] GI, notebook no. 3: entries of 12 and 14 November 1925. Cf. Leek, *Human Remains*, 6.

[80] *Tomb* II, 133–4.

[81] Patch, *JARCE* 32, 93. Cf. the find-spot of Shoshenk II's amulet, 'under the body near the waist': see G. Brunton, 'Some Notes on the Burial of Shashanq Heqa-kheper-re'. *ASAE* 39 (1939), 546.

[82] J. de Morgan et al., *Fouilles à Dahchour*, II (Vienna, 1903), 54.

[83] Farag and Iskander, *Neferwptah*, 72.

[84] J. de Morgan et al., *Fouilles à Dahchour*, I (Vienna, 1895), 113.

d'objets direct that they had to be positioned, namely *r ḫ.t.f*, 'at his (the deceased's) belly',[85] and where a *sjꜣt* would be located when worn as part of the 'Lower Egyptian garment'. Unquestionably, the find-spot of the king's swallow corresponds better with the position of the belt and the apron than with the position of the bracelet (fig. 7).

Conclusion

On the basis of the evidence adduced above, I question the correctness of Carter's reconstruction and suggest that the carnelian swallow forms an ensemble with the belt, the apron, the tail and the dagger. I am aware of the problems involved. Firstly, one might argue that in Tutankhamun's case the hip drape—essential for the fastening of the *sjꜣt*—is missing. So far, there is no decisive evidence that a hip drape was found on the royal mummy, but the possibility cannot be excluded that this accessory was present. Whereas the apron was lying in the centre of the body, between the thighs, the hip drape should have been positioned on the left side, over the thigh and the hip. On account of this

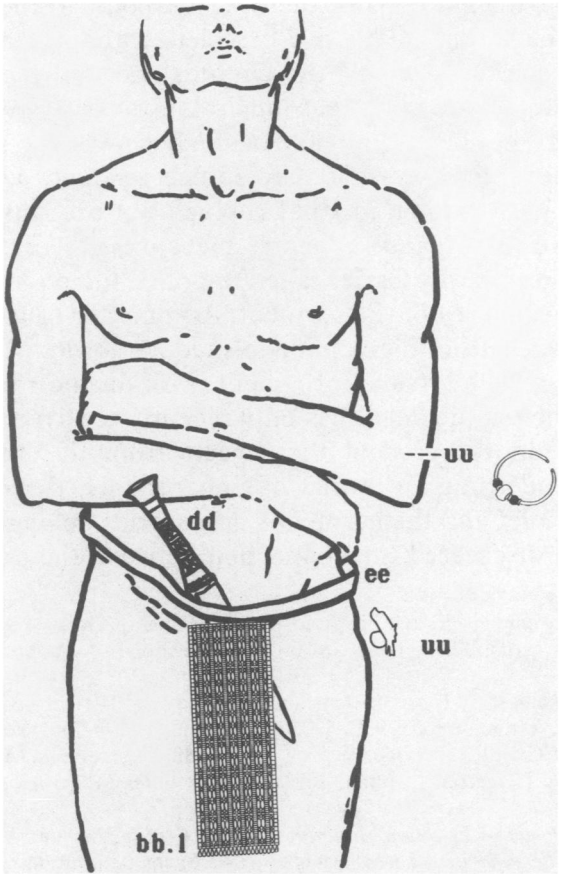


FIG. 7. The royal mummy with the belt, dagger, apron, *sjꜣt*-amulet and bracelet *in situ* (two drawings by H. Carter, combined and adapted by the author, after Reeves, *Tutankhamun*, pls. on p. 113).

[85] Jéquier, *Frises d'objets*, 92.

'unlucky' position and in view of the fact that the threads of all the beadwork objects found on the mummy had decayed, it is possible that the hip drape had fallen in the debris on the left side of the body. As appears from the excavation diary, Carter originally did not realize that the mesh of beadwork lying over the abdomen and the thighs once formed an apron and an *ousekh*-collar. He simply designated the entire group 'BB'. It is thus possible that the beads he collected from the 'rubbish' on the left side of the mummy were considered by him as a part of this group. Afterwards, he recognized the nature of the beadwork objects, but as they were neither restrung nor reconstructed on paper, it is not clear whether he understood the whole composition of these objects or whether he took into account all the beads he had found. However that may be, there are indications that the king's belt was originally designed to be worn in combination with a hip drape: to the wearer's left the lower edge of the belt has nineteen perforations. These holes seem to indicate that the hip drape was normally attached to the left side of the belt. This view is supported by the fact that the swallow was found on the left side of the mummy.[86]

Secondly, if my hypothesis is accepted, the bracelet lacks a centre-piece. However, this does not present difficulties as other examples of open bangles are known.[87] The argument that the loop-shaped ends of the bracelet point to the original presence of a centre-piece can also be disproved, as two bracelets without centre-pieces have similar ends in the form of loops.[88] Moreover, the circumstances of the finding of the swallow bracelet and its counterpart are such that much doubt exists about the original appearance of these two bangles. This has already been shown for the swallow bracelet. As for the bangle with the six *wedjat*-eyes, it may suffice to quote a passage from Carter's archaeological diary: 'WWW: Fallen in [the] rubbish but probably from [the] right arm, a small wire bracelet with bead, and (?) centre-piece missing'.[89]

Finally, one might wonder why Carter failed to notice the possible connection between the swallow and the accessories of the garment. As a matter of fact, he did not originally see that the beads covering the thighs once formed an apron. Moreover, the number of representations showing the *sjꜣt* as an ornament worn on the royal kilt is rather limited and this particular iconographic detail has only recently received attention in the articles of Grimm and Patch. In the case of the objects from the above-mentioned Middle Kingdom mummies and from the burial of Shoshenk II, the excavators also did not notice that the bird-amulet and the garment's accessories belonged together. It was only in 1971 that Wilkinson discovered the connection between the objects of Shoshenk II.[90]

[86] The second belt—which belongs to another kind of apron—has perforations on both sides of the central 'name buckle' (GI, inventory card). These holes are probably designed to attach the apron and some sashes to the belt.

[87] De Morgan et al., *Dahchour* I, 61 (nos. 10–11), fig. 129, pl. xvii (10–11) (=Vernier, *Bijoux*, CG 52022–3); 66 (no. 17), pl. xxii (17) (=Vernier, *Bijoux*, CG 52056–7); II, 53 nos. 6–7 (=Vernier, *Bijoux*, CG 52050); 60 (no. 13) (=Vernier, *Bijoux*, CG 52043); Vernier, *Bijoux*, CG 52058; E. Staehelin, 'Arm- und Fußreife', *LÄ* I, 442; C. Desroches-Noblecourt and J. Vercoutter (eds), *Un siècle de fouilles françaises en Egypte, 1880–1980* (Cairo, 1981), nos. 100–1.

[88] C. A. R. Andrews, *Catalogue of Egyptian Antiquities in the British Museum*, VI: *Jewellery* (London, 1981), no. 276; N. Thomas (ed.), *The American Discovery of Ancient Egypt* (exhibition catalogue; Los Angeles, 1995), no. 50.

[89] GI, notebook no. 3: entry of 15 November 1925.

[90] *Jewellery*, 177. Yoyotte stated that this discovery was made independently by C. Ziegler in the 1980s; see J. Leclant et al., *Tanis: l'or des pharaons* (exhib cat; Paris, 1987), 252.

The true nature of the Middle Kingdom objects was not understood until the publication of Patch's paper on the 'Lower Egyptian garment' in 1995.[91]

Postscriptum

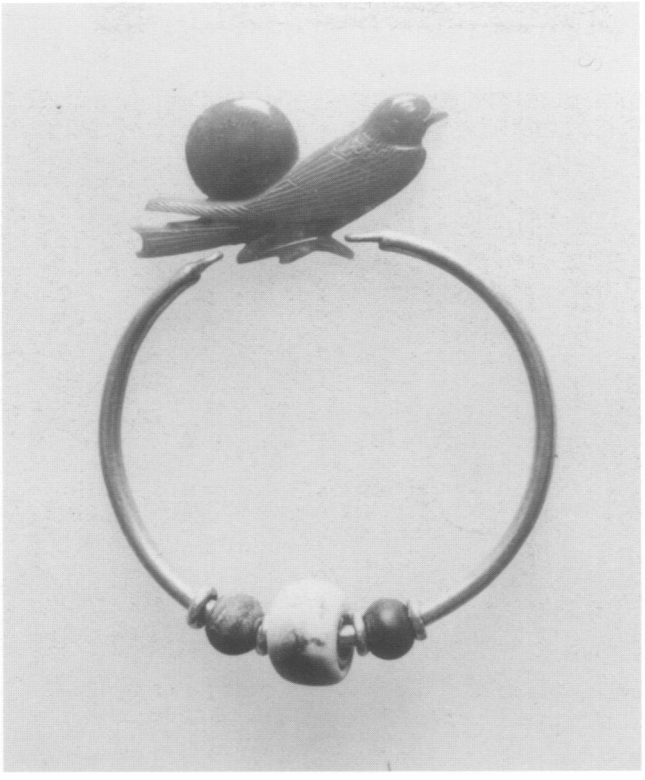
Three additional Eighteenth Dynasty representations of the king wearing the garment with the *sjꜣt*-amulet have come to my notice. One is on the northern part of the west wall of the Upper Court in Hatshepsut's mortuary temple at Deir el-Bahari. The two others are in the nearby Tuthmosis III temple, on the west wall of the Hypostyle Hall and on the west wall of the chapel to the north of the Bark Shrine. These representations reinforce the view that this kind of royal garment was more often worn in the New Kingdom than hitherto had been supposed. I have explained the fact that relatively few post-Middle Kingdom representations of the garment have been preserved by supposing that in the New Kingdom the distinctive accessories of the garment were in most cases merely painted. This is now confirmed by the two examples of the Tuthmosis III temple. In these representations the apron, the hip drape and the bird-pendant are only applied in paint. I wish to thank Prof. J. Lipinska and Dr J. Aksamit of the Polish/Egyptian Mission to the Tuthmosis III temple at Deir el-Bahari for providing me with information on these three unpublished representations.

Post-postscriptum

In not questioning Carter's information about the date of discovery and the find-spot of the bracelet, I overlooked a major piece of evidence. A Burton photograph, which, based on the stage in the unwrapping, can be dated to 15 November 1925, shows a bracelet lying in the debris near the right elbow. At the time, I only possessed a photocopy of this photograph, on the basis of which it was impossible to say whether it pictured the 'swallow bracelet' (Obj. no. 256uu) or its counterpart, the bracelet with the *wedjat*-eyes (Obj. no 256www). Since, according to Carter, the latter was found in that position and on that day, I assumed that the photograph showed the *wedjat*-eyes bracelet. However, when I came across a clear reproduction of the photograph (P. Fox, *Der Schatz des Tut-ench-Amun* (Wiesbaden, 1960), pl. 40; not in the English edition), it turned out to be the other bracelet! After a close reanalysis of the relevant excavation diary entries, the explanation became clear. The 'gold wire amulet with small amulets attached' found 'near the elbow of the left arm' (14 November) is not the 'swallow bracelet' as had hitherto been assumed, but the *wedjat*-eyes bracelet; the 'small amulets' allude not to the beads of the former, but to the small *wedjat*-eyes of the latter. Similarly, the 'swallow bracelet' better fits the description of the bracelet 'fallen in the rubbish but probably from the right arm' (15 November) than the *wedjat*-eyes bracelet; 'bead' refers to the large cylindrical bead of stone and the remark '(?) centre piece missing' is inspired by the bracelet's loop-shaped ends. Thus, owing to the rather general descriptions in the excavation diary, the two bracelets were confused by Carter and this led to the unfounded association of the bracelet with the swallow. As it is out of the question that the swallow is a part of the *wedjat*-eyes bracelet (there is no space to attach it), this is another important argument in favour of my hypothesis.

The symbolism of the Tutankhamun objects discussed here will be addressed by the author in his doctoral dissertation on Tutankhamun's mummy equipment (in preparation).

[91] *JARCE* 32, 103–7.



1. Tutankhamun's bracelet with a swallow supporting the sun disc (*photograph by H. Burton: GI neg. 2016, reproduced by permission of the Griffith Institute, Oxford*)

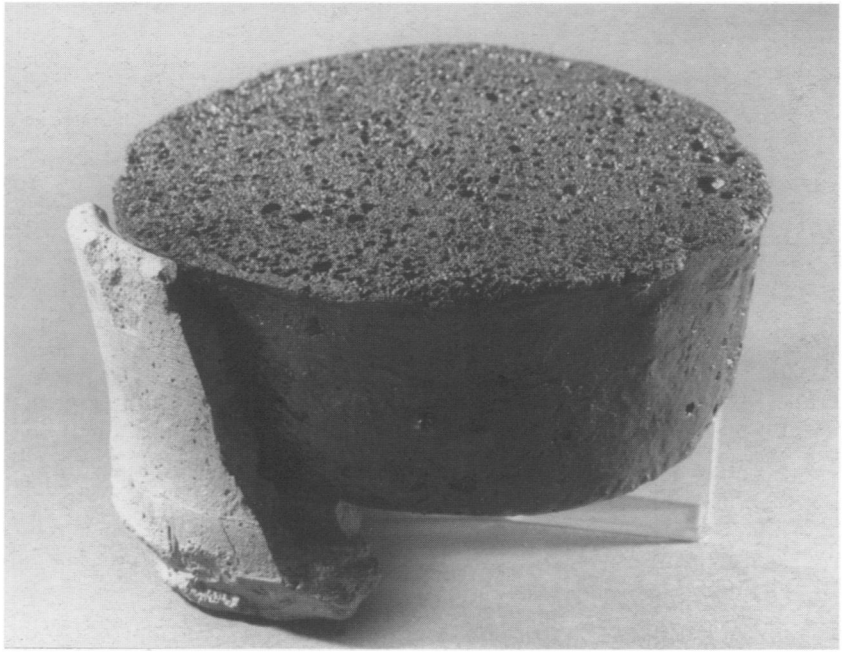
2. The royal mummy from the lower part of the abdomen to the upper part of the thighs (*photograph by H. Burton: GI neg. 817, reproduced by permission of the Griffith Institute, Oxford*)

TUTANKHAMUN'S CARNELIAN SWALLOW WITH SUN DISC (pp. 109–25)

1. The royal mummy from the lower part of the abdomen to just above the knees (*photograph by H. Burton: GI neg. 781, reproduced by permission of the Griffith Institute, Oxford*)

1. Two ceremonial tails lying on the bottom of the gold coffin, from the pubis to halfway down the shins (*photograph by H. Burton: GI neg. 793, reproduced by permission of the Griffith Institute, Oxford*)

TUTANKHAMUN'S CARNELIAN SWALLOW WITH SUN DISC (pp. 109–25)



2. Cast of the Ulu Burun ingot KW4 in cylindrical vessel 1, a surface find from Tell el-Amarna

THE ULU BURUN GLASS INGOTS, CYLINDRICAL VESSELS AND EGYPTIAN GLASS (pp. 143–53)

NEW KINGDOM GLASS-MELTING CRUCIBLES FROM QANTIR-PIRAMESSES

By THILO REHREN *and* EDGAR B. PUSCH

Recent work at Qantir-Piramesses revealed a group of crucibles related to glass-working. At least 40 individual crucibles were identified, dating to the reign of Ramesses II or slightly earlier. They are almost cylindrical in shape. The fabric was a local Nile clay (Vienna Nile E) without much visible temper. Most fragments are coated on the inside with a white layer. The crucibles resemble finds from Tell el-Amarna, also attributed to New Kingdom glass-working. They also relate to a solid glass ingot fitting precisely into the reconstructed crucibles. The crucible fragments from Qantir allow us to deduce their original mode of operation, and give new insight into the organisation of Egyptian glass-making and high temperature industries.

Site Q I at Qantir

THE well-defined stratigraphy of this first major excavation site at Qantir contains two clearly discernible strata (B/2 and B/3) which are of interest here. Below the latest stratum (B/1), comprising the destruction layers of earlier stratum B/2 and a much eroded cemetery of late Ramesside and post-Ramesside date, there is a highly differentiated architecture which in itself is divided into two connected functional units. This stratum B/2 may be described by the term 'Chariotry' and can readily be compared to 'The Armoury', especially '... the headquarters of thy chariotry ...' mentioned in the hymn in praise of Piramesses in Papyrus Anastasi III 7, 5.

The northern part of stratum B/2 consists of a vast peristyle court while its southern half contains multi-functional workshops, in which a series of rooms and buildings housed a wide range of crafts involving organic substances like wood, leather, reed, horn and especially bone for carving, but also inorganic materials. Besides the processing of flint and other kinds of stone, the most important features are high temperature technologies like melting gold, casting bronze and working glass and faience, represented by debris such as slags of different kinds, charcoal, drops of fused metals, lumps of extremely corroded red glass and recycled scrap objects, as well as crucibles, open and bi-valve moulds made from limestone and ceramic. These were found lying on the workshop floors, sometimes right next to hearths or inside rubbish pits and were accompanied by numerous tools such as different kinds of hammers, knives, punches and tongs.

While these functional units of a highly differentiated 'assembly line' occur throughout the entire stratum, B/2 is split into two substrata in the peristyle court area. The court originally contained no octagonal pillars (stratum B/2b), those being added later, according to the inscriptions on the occasion of the first 'Revival-Jubilee' of Ramesses II in his thirtieth regnal year (stratum B/2a). This sequence is paralleled by a more complex stratigraphy within the workshops, which has yet to be fully developed. Here, houses and rooms were remodelled in even shorter periods of time.

The whole of stratum B/2 is dated to the reign of Ramesses II and his successors, as deduced not only from the archaeological evidence but also from architectural pieces inscribed with the royal protocols of Merneptah and Ramesses III, found by us and by earlier excavators on the site, but unfortunately out of context. This dating for stratum B/2 is further augmented by a group of unique limestone moulds found at the workshop area, one of which was still *in situ* and accompanied by a stone hammer, punches and metal scrap. These are for embossing sheet metal into appliqués of the 'Figure-eight-shield' type, used exclusively by Hittites and their contingents, best depicted in the Egyptian scenes of the battle of Qadesh. The production of these appliqués in an Egyptian city, to be identified with the *urukmannu* mentioned in Amarna letters I 47, III 42 and III 44, almost certainly postdates the first diplomatic marriage of Ramesses II to a Hittite princess in his regnal Year 34.[1]

The fragments of glass-melting crucibles discussed below were recovered from floors, room corners and similar places from stratum B/2 as well as from pits. Some of the pits are obviously contemporaneous with strata B/2a and B/2b, others are later and comprise mixed material from different strata. Nevertheless, we feel confident in allocating even the pit material related to glass-melting to stratum B/2 since enough comparative objects were found there in secure contexts.

While the workshops in the southern unit already existed in the underlying stratum B/3 and continued to function in a modified way in stratum B/2, the northern half of site Q I was originally covered by an extensive bronze foundry.[2] This contained several groups of parallel pairs of linear hearths built of mud brick, each hearth having a minimum length of 14 m and a width of only 0.5 m. In operation each hearth carried at least twenty round-bottomed crucibles, heated from above by tuyères and (probably pot) bellows as depicted in the tomb of Rekhmire.[3] North of each pair of 'melting channels' and functionally related to it was a 'cross furnace', so named because of its cross-like layout, of originally unburnt Nile-mud bricks. These cross furnaces are tentatively interpreted as huge installations for heating moulds for large objects—for instance, doors—and keeping them hot until the process of casting had been finished. This casting involved pouring the contents of all the crucibles from two melting channels, i.e. handling at least 40 crucibles full of molten bronze for one single melting cycle, several of them being necessary to complete the cast.

In addition to these permanent installations, a complete spectrum of waste products was found within and scattered around them, comprising huge amounts of charcoal and ash, thousands of crucible fragments and hundreds of tuyère fragments all made of the local Nile clay. Again recyclable objects of bronze, bronze melting slag with metal prills and highly calcinated animal bones, complete this picture of bronze production. This bronze foundry stratum B/3 is also divided into two substrata. In the upper one (B3/a) the melting channels are oriented north–south, while the lower, earlier one (B/3b) contains even longer melting channels oriented west–east which are related to an even

[1] E. Pusch, 'Metallverarbeitende Werkstätten der frühen Ramessidenzeit in Qantir-Piramesse/Nord', *Ägypten und Levante* 1 (1990), 75–113.

[2] Ibid. and E. Pusch, 'Divergierende Verfahren der Metallverarbeitung in Theben und Qantir? Bemerkungen zu Konstruktion und Technik', *Ägypten und Levante* 4 (1994), 145–70.

[3] N. de Garis Davies, *The Tomb of Rekh-mi-Rēʿ at Thebes* (MMA Egyptian Expedition 11; New York, 1943), I, pl. lii.

bigger cross furnace, although both types of structure are less well preserved than in stratum B/3a. According to our own surface surveys, trial pits, sample trenches and the earlier excavations by Mahmud Hamza in 1928 and Labib Habachi around 1940 in the vicinity of our site Q I, the foundry area of stratum B/3 covered more than 30,000 sq m.

The subdivision of stratum B/3 also applies to the workshop area in the south with finds, objects, materials and functions almost identical to those listed above for stratum B/2, including the glass-melting remains. This implies that the crucibles recovered from later pits may originate not only from stratum B/2, but also from the earlier stratum B/3. The detailed stratigraphic evaluation of structures and pits is still in progress.

The upper dating limit for stratum B/3 is provided by the fact that it was entirely covered by stratum B/2, which was well underway under Ramesses II in his regnal Year 30. Stratum B/2 with its two substrata already existed during the early years of his reign according to internal and external evidence. Thus, most probably stratum B/3 was active at the beginning of Ramesses II's reign, possibly starting during the reign of his father Seti I. Internal evidence, such as inscribed objects, from this stratum is still missing, however. The tremendous amounts of bronze being processed at the foundry of stratum B/3 are most probably related to the systematic enlargement and building of the new Ramesside capital during the early years of Ramesses II. The previous stratum at Qantir, comparable to stratum D/1 of Tell el-Dabʿa, definitely dates to the early Eighteenth Dynasty by virtue of its completely different pottery. Nothing is known about the extension, function and contents of this stratum at Qantir, except for a few isolated patches of floors, walls and diagnostic pottery fragments.

The latest excavations at site Q IV (see fig. 1) indicate that stratum B/3 of site Q I may continue somehow below strata Bb-c of site Q IV, which contain huge stables for several hundred horses. From site Q IV a few fragments of glass-melting crucibles and related debris were also recovered. All of those are out of context according to our present knowledge, and await further consideration. It should be noted, however, that Q IV produced most of the examples of a slag type ('layered black and white slag') tentatively related to glass production, which is virtually absent at Q I.

The crucibles

An investigation of stratified material excavated during the seasons 1980 to 1995 led to the identification of 40 fragments large enough to attribute to individual vessels and to reconstruct their base diameters with a precision of 1 cm (Table 1). There are several hundred smaller fragments, but no detailed seriation and assignation to individual vessels has been done yet. However, the available material is more than sufficient to establish them as the general type of a New Kingdom Egyptian glass-working crucible, and to demonstrate the existence of a large scale glass industry on the site.

Shape

The overall contour of the glass-working crucibles is almost cylindrical. They possess a flat base and walls which are almost perpendicular or only slightly widening at the top (fig. 2). The rim is usually straight and curving slightly outward. The base, though generally flat, is sometimes slightly arching towards the centre. Most of the bases show

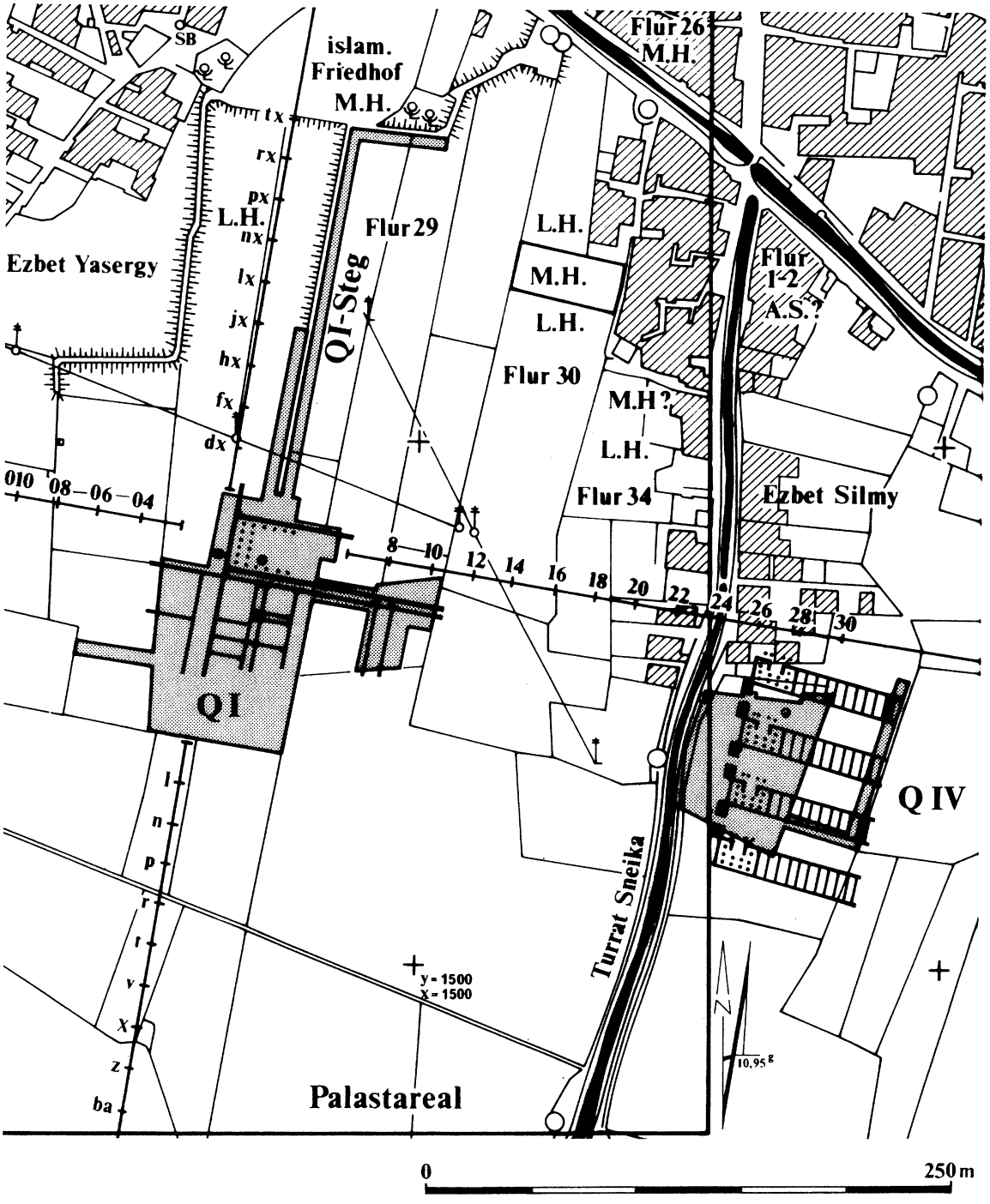


FIG. 1. Map showing the relative situation of sites Q I and Q IV in the southern periphery of Qantir. The areas marked L.H. refer to the sites excavated by Labib Habachi in the early 1940s, and the areas M.H. to those excavated by Mahmud Hamza in 1928 (Qantir excavation drawing by J. Lindemann).

clear traces of wire cutting (fig. 3), and quite often groups of finger marks from lifting the wet pot off the potter's wheel can be seen.

The wall thickness is uniformly 8 to 12 mm. At the heel of the vessel, i.e. where the walls join the base, the thickness is often increased to 2 or even 3 cm, but tapers again towards the centre of the base. A list of all fragments with more than one fifth of the entire circumference preserved is given in Table 1. It is obvious that the great majority of crucibles have an outer diameter of 15 to 16 cm at the base, and about 1 or 2 cm more

TABLE 1. *Listing of Larger Fragments of Cylindrical Crucibles from Qantir-Piramesses*

FZN number	External diameter (base, in cm)	Percent preserved (approx.)	Ext. height preserved (in cm)	Find square (grid system to be published)
80/0023	15	50		surface
82/0067,2	14	50		Q I-ax/4.5
83/0660c	10	25		Q I-e/01
83/0148b	16	15		Q I-e/3
83/0212b	16	25		Q I-e/2
83/0255b	17	20	7.5 +	Q I-d/4.5
83/0828b	14	30	6 +	Q I-e/02.03
83/0829a,40	14	25		Q I-d/02.03
83/0860	13	100	8 +	Q I-f/2
83/1065c	16	30		Q I-f/4.5
83/1029,9	14	20		Q I-d/02.03
84/0088	15	100	13 (complete)	Q I-e/02.03
84/0160b	12	20		Q I-f/3
84/0165b	16.5	20	10 +	Q I-f/3
84/0322c	14.5	45	5 +	Q I-e/02.03
84/0390c	16	30		Q I-d/02.03
84/0414	18	100	6 +	Q I-f/3
84/0680c	16	25		Q I-c/4.5
84/0736	—	—	12 +	Q I-e/3
84/0754	14.5	50		Q I-a/3
84/0792c	15	20		Q I-c/3
84/0912	14	40	8 +	Q I-e/3
84/0912b	15	100		Q I-e/3
84/1333b	16	30		Q I-e.f/3
85/0231b	15.5	50	9 +	Q I-c/4.5
86/0087c	16	20		Q I-d/4.5
86/0109d	15	20		Q I-c/10.11
86/0422b	16	25		Q I-d/4.5
86/0460b	15	20		Q I-b/3
86/0464c	15	25		Q I-b/4
86/0475	14.5	100		Q I-ax/3
86/0724a	18	90		Q I-d/4.5
86/0795d	16	20	7 +	Q I-d/4.5
87/0162b	16	30		Q I-ax/4.5
87/0762,339	17.5	75		Q I-a/3
87/0762,341	16	25		Q I-a/3
88/0492b	18	20		Q IV-f/30
88/1409b	18	20	12 +	Q IV-g/27
92/0013	22?	20		Q IV-g/28
92/0688b	15	35		Q IV-g/29.30
92/0688b	14	35		Q IV-g/29.30

FIG. 2. Glass-melting crucible FZN 84/0088 from Qantir. The profile is complete, giving a height of 13 cm. The base measures 15 cm in diameter. Note the area of intensive firing just left of the finger marks near the base (Qantir excavation drawing by J. Klang).

FIG 3. Bottom view of crucible FZN 84/0414, showing the preserved traces of wire cutting at the base. Base diameter is 18 cm (Qantir excavation drawing by J. Klang).

at the rim. The height of the crucibles is less well established; only one complete profile has been found so far, measuring 13 cm from base to rim (fig. 2).

The internal contours of the lower parts are less regular than the outside, ranging from hemispherical to rectangular (fig. 4a–d). The inner surfaces frequently bear groove marks or ripples, often spiralling from a small mound at the centre of the base to just over the heels, while the upper parts of the inner surfaces and the entire outer surfaces are usually smoothed and appear to have been thrown on the wheel.

The entire insides of the vessels are regularly coated with a thin layer of whitish material (pl. XVIII, 1), measuring usually less than 1 mm in thickness, but sometimes reaching as much as 2 mm. This layer is always restricted to the inner surfaces of the crucibles and was probably applied as quicklime. Its present composition is a mixture of lime silicates and lime.

A range of fragments bear signs of severe overfiring, i.e. bloating of the ceramic. Curiously, this is usually restricted to circular spots near the heels of the vessels, rarely exceeding a few centimetres in diameter. Some larger pieces show up to three such 'hot spots' distributed almost evenly around the circumference of the base, as if the heat had been focused on these spots.

Fabric

The fabric of the crucibles appears to be the locally available Nile clay with little temper. There is some organic material, most probably chaff, added to the clay and only very

little, if any, sand. Clearly belonging to fabric Nile E according to the Vienna system,[4] a precise match cannot be given due to the different firing conditions for domestic and industrial pottery. Macroscopic observation shows that it is much denser and less porous than Nile E of the Vienna system and it has been attributed to fabric I E.01 in the Qantir-Tell el-Dabʿa subdivision. With domestic pottery this fabric's surface and section is dominated by conspicious fine and medium-sized rounded grains (0.3–0.8 mm), while other mineral inclusions comprise angular particles of fine and coarse sand, some mica and sometimes chaff. The crucible fabric is, in itself, a denser variant of fabric I E.01, with the chaff burnt out completely and its colour ranging from dark red to black.

This is supported by examination under the petrographic microscope, where the ceramic shows a dense, highly vitrified matrix with occasional quartz grains and the remains of organic temper as ghost structures (pl. XVIII, 2). Often, the matrix bears disseminated iron oxide particles precipitated from the matrix as well as a few slightly coarser primary grains. The vitrification is not restricted to the internal or external

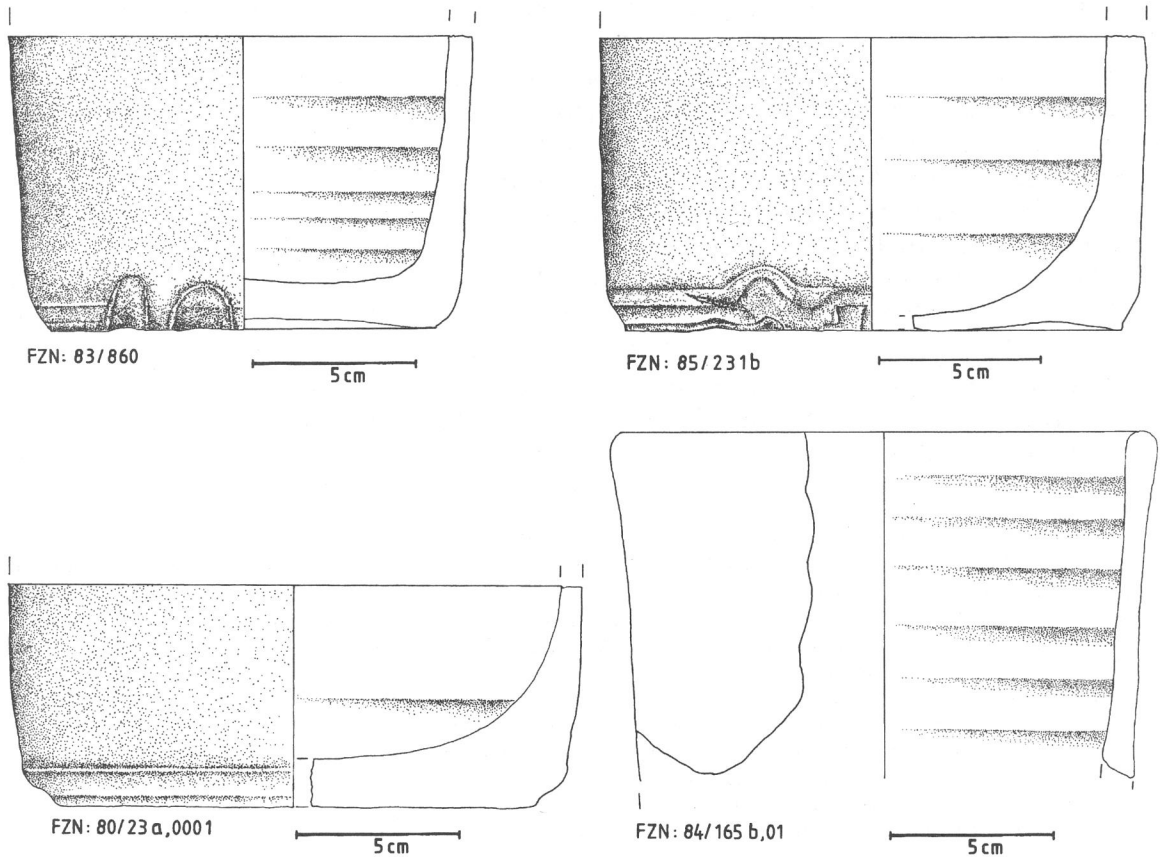


FIG. 4. Cross-sections of four crucible fragments showing the range in the internal profile (Qantir excavation drawings by S. Grotelüschen).

[4] H.-Å. Nordström, 'Ton', *LÄ* VI, 629–34; D. Aston, *Die Keramik des Grabungsplatzes Q I*, Teil I—*Corpus of Fabrics, Wares and Shapes* (*Forschungen in der Ramses-Stadt*; Mainz, 1997, in press).

surface, but goes right through the body. Obviously, the vessels were used under rather high temperatures and reducing conditions, resulting in the formation of black wüstite (FeO) or magnetite (Fe_3O_4) instead of red haematite (Fe_2O_3).

The white layer has been studied on a very thick example and was found to consist of a layered structure with a calcium silicate reaction zone adjacent to the ceramic, followed by an extremely fine-grained calcium carbonate layer and an outermost area again rich in calcium silicates. Texture and deduced preparation technique are discussed elsewhere in more detail,[5] and interpreted as the result of a quicklime lining applied prior to the use of the vessels. The present phase arrangement is a result of the high temperature reaction of this layer with the vessel and the charge, and the subsequent alteration of these products.

Relationship to glass

This type of cylindrical crucible has been attributed to glass technology for more than a century.[6] Several arguments support this interpretation of the Qantir crucibles as well. First of all, glass is frequently attached to the sherds, either as a thin film running down the outside from rim to base (fig. 5), or as a residual layer at the bottom of the crucible. The original colour and composition of the external glass is hard to determine; it has reacted strongly with the ceramic material and is much weathered over the millennia. The glass preserved inside the crucibles appears green in the majority of cases but was red originally, as will be shown below. The white layer acted very effectively in separating the hot glass from the ceramic.[7] On the walls, traces of glass are usually absent, while only at the bases did the glass sometimes penetrate through the white layer and is hence preserved where it stuck to the ceramic.

The most striking evidence for the use of these vessels, however, comes from a solid glass ingot found in 1928 by Mahmud Hamza at Qantir[8] and now on display in the Egyptian Museum in Cairo (JE 64296, pl. XVIII, 3).[9] Its upper walls are close to cylindrical with a protuberance at one side, while its base contour is hemispherical. The top surface is very smooth and flat with a slightly concave curvature, reaching at its maximum a depth of 3 mm. The sides are rougher and look eroded and fractured. The reconstructed diameter at the top measures about 13 cm, while the height of the ingot

[5] Th. Rehren, 'Ramesside Glass Colouring Crucibles', *Archaeometry* 39/2 (1997), 355–68.

[6] W. M. F. Petrie, *Tell el Amarna* (London, 1894), 25–8; W. E. S. Turner, 'Studies of ancient glass and glass making processes. Part I. Crucibles and melting temperatures employed in ancient Egypt at about 1370 B.C.', *Journal of the Society of Glass Technology* 38 (1954), 436–44T; P. Vandiver, 'Appendix A: The Manufacture of Faience', in A. Kaczmarczyk and R. E. M. Hedges, *Ancient Egyptian Faience* (Warminster, 1983), A1–A144 plus figures; P. Vandiver, C. Swann and D. Cranmer, 'A Review of mid-second millennium B.C. Egyptian glass technology at Tell el-Amarna', *Materials Issues in Art and Archaeology*, II (Pittsburgh, 1991), 609–16; P. Nicholson, *Egyptian Faience and Glass* (Shire Egyptology 19; Aylesbury, 1993); id., 'Glassmaking and Glassworking at Amarna: Some new work', *Journal of Glass Studies* 37 (1995), 11–19; id., 'Recent excavations at an ancient Egyptian glassworks: Tell el-Amarna 1993', *Glass Technology* 36 (1995), 125–8.

[7] Turner, *Journal of the Society of Glass Technology* 38, 440T.

[8] M. Hamza, 'Excavations of the Department of Antiquities at Qantir (Faqus District)', *ASAE* 30 (1930), 31–68.

[9] We are most grateful to Dr M. Saleh, Egyptian Museum, for enabling us to study this block macroscopically in May 1995. It is on exhibition in room P44, showcase 6136B, together with other high temperature industrial debris from Qantir, including evidence for the working of bronze, faience, Egyptian blue and gold. Anja Herold took a series of pictures of these finds without tripod or any other technical assistance. We are extremely grateful for her help.

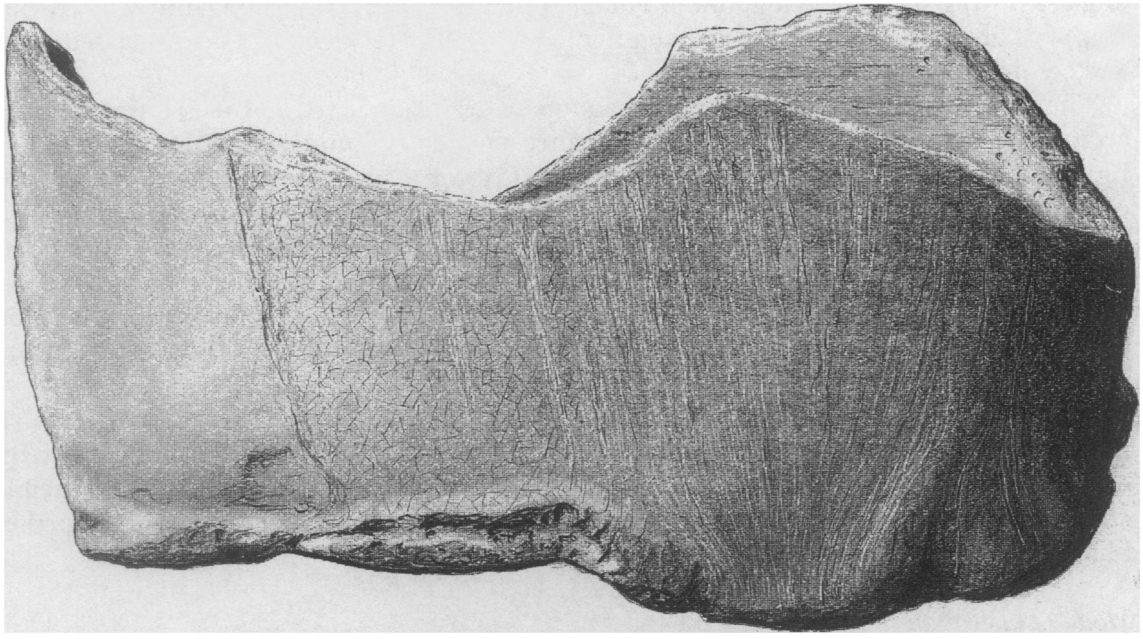


FIG. 5. Drawing of crucible fragment FZN 84/0414. The base is slightly deformed due to softening of the ceramic, and there is a broad flow of thin glass down the front (Qantir excavation drawing by J. Klang).

is about 10 cm. The volume of the block is estimated to 1 litre, equalling roughly 2.5 kilograms of glass. The entire surface of the block is bright green to greenish white, with a thin (about 0.5 mm) black layer at the top and a dark red core just visible at a few damaged areas in the green surface layer. A few vesicles are visible, usually less than 1 mm in diameter. At the bottom, there is an area of about 2.5 by 3.5 sq cm covered by a white material closely resembling the whitish layer of the crucibles. A similar patch is visible near the upper edge. The entire block would fit perfectly into one of the crucibles from Qantir, ignoring the deformation at the upper part of the ingot.

The colour of most glass fragments found at Qantir is green. Microscopic analysis proved that all this glass was originally red, coloured by cuprite. Due to severe weathering of the material in the generally very corrosive and wet conditions of the Nile Delta, most of the cuprite has been transformed to green corrosion products. Clear evidence for this is found in the core of some larger fragments where some red glass is still preserved. The transition from red to green is accompanied by the leaching of most of the alkalis from the glass matrix, leaving behind a highly hydrated, amorphous, silica-rich gel.

Interpretation

Glass technology consists of two major aspects: making the raw glass, including its colouring, and working the glass to shape. For Egyptian glass, we know a good deal about the hot and cold shaping of vessels,[10] but have only limited evidence for the actual making

[10]See most recently E. M. Stern and B. Schlick-Nolte, *Early Glass of the Ancient World 1600 BC–AD 50, Ernesto Wolf Collection* (Stuttgart, 1994).

of glass during the New Kingdom. It is hoped that the crucibles from Qantir will provide more insight into this technology, augmented by further studies of the associated slags and semi-fused materials.

The vast majority of glass fragments and glass traces attached to the Qantir crucibles are opaque cuprite-red glass. This dominance of a colour unusual in the spectrum of Egyptian glass-making is taken as strong evidence for a specialisation at the workshops of Piramesses. It seems to be of some importance that in very close proximity there was a huge bronze casting area[11] and workshops for various metallurgical activities. The frequent occurrence within the same context of raw Egyptian blue in the form of cakes, bags and semi-finished objects further supports the idea of a craft complex based on copper, manipulated with highly developed abilities to control composition, temperature and redox conditions.

Only a few fragments of transparent blue glass have been found at Qantir. One is an isolated bit of glass, about 5 by 2 by 2 cm that may have been brought in from somewhere else, while another one clearly adheres to a fragment of an overheated collapsed crucible and therefore belongs with certainty to the glass factories of Qantir-Piramesses. A further blue glass fragment was found by M. Hamza in 1928 (Cairo JE 64679).

Mode of operation

The material excavated at Qantir allows us to reconstruct not only the shape of the glass crucibles, but also to some extent the way in which they were used. The basic question is whether they were employed as vessels for melting glass, i.e. as crucibles, or whether they were employed merely as supports for fritting pans, as originally suggested by Petrie[12] in view of similar finds from Tell el-Amarna (see below). There are several arguments in favour of the first possibility, that is, the use as real crucibles. First, there are clearly runners of glass dripping from the rim of the vessels down towards the base. This is very similar to the everyday experience of, for example, milk or honey, running down the outside of a beaker, where at the rim there is a broad area covered by the liquid, merging to a narrower flow as it goes down the outside. The liquid only accumulates again at the base and, depending on its viscosity, either builds up to form thicker drops like honey, or penetrates the narrow void between the vessel and its support, again wetting a larger area. The second argument is based on the ubiquitous white layer inside the vessels, which makes no sense if they were used upside down as mere supports. The last and conclusive evidence, however, is the block of red glass (see above) which perfectly matches the Qantir crucibles. Based on these three arguments, the function of the cylindrical vessels as crucibles for the preparation of molten glass seems obvious, and this will form the basis for the following discussion.

The crucibles were employed in the final step of glass preparation, the addition of the colourant. We do not know in which form the glass base was put into the crucibles, but we may assume that an already-prepared glass was used, perhaps in the form of crushed material from previous melting and refining steps. The colourant was at least in part added as metallic bronze, but was subsequently transformed to finely-dispersed cuprite. The craftsmen were able to control the redox and temperature regime inside the

[11] Pusch, *Ägypten und Levante* 1, 75–113, and 4, 145–70.
[12] *Tell el Amarna*, 25–8.

crucibles with sufficient accuracy first to oxidise and dissolve the copper in the melt and then to precipitate the cuprite while the charge cooled. This process is particularly delicate for lead-free glasses[13] such as those from Qantir. By the end of the process, the vessels held a solid charge of about 2.5 kilograms of red glass, filling about three-quarters of the total crucible volume.

The frequent, though limited, flows of glass down the outside of the crucibles probably indicate stirring and testing of the melt. It was impossible for the craftsmen to judge the progress of the process just by visual examination of the glowing charge in the fiercely burning furnace chamber. Instead, they had to stir the melt in order to homogenise it and certainly would also have evaluated its viscosity on that occasion. Removing the rake from the vessel inevitably drew some of the viscous glass over the rim (remember the honey pot!).We have no direct evidence for the use of such a rake, but it must have been made of copper rather than bronze to be able to withstand the temperature of the hot melt. A ceramic rod would have been too fragile and might have contaminated the glass melt, while any organic material would have been burnt away at once, disturbing the redox balance.

Heating

A central aspect in the use of crucibles is their mode of heating. The history of metallurgy provides a wide range of different possibilities, including the burning of charcoal in wide open vessels, putting taller vessels in a burning charcoal bed, and applying radiant heat to the crucible as in a reverberatory furnace. In the last two cases, the heat has to penetrate the crucible walls, while in the first the heat is produced in direct contact with the charge, as in the case of the bronze melting crucibles from Qantir. On the glass crucibles from Qantir, we regularly identified up to three areas of very intensive firing near the base, evenly distributed around the circumference of the vessel (see above and fig. 3). These 'hot spots' are usually only a few centimetres in diameter, but the fabric there reached the very limit of its stability. The vessel surfaces show severe bloating, and quite often cracks radiate out from these spots, resulting in seeping of liquid glass from the interior through these fissures. Thin sections of these areas demonstrate the high degree of vitrification throughout the body, and show the penetration by the glass (pl. XVIII, 4). For thermal reasons, however, the whole crucible must have been at very high temperatures while the 'hot spots' were active, otherwise the differences in thermal expansion would have led to total destruction of the vessels. Turner[14] determined the temperature range of the crucible fragments from Amarna and found them to soften around 1100°C or 1150°C. From this, we can assume that the overall temperature of the Qantir crucibles was in the range of 1050°C, while at the 'hot spots' temperatures probably went up to and above 1100°C.

Some overheating is necessary to promote a sufficient heat flow through the walls. Focusing the really high temperatures on three isolated spots around the vessel had several benefits. Ceramic material is known as a good thermal insulator, partly due to its

[13] A. Achmed and G. Ashour, 'Effect of heat treatment on the crystallisation of cuprous oxide in glass', *Glass Technology* 22 (1981), 24–33; I. Freestone, 'Composition and microstructure of early opaque red glass', *Early Vitreous Materials* (BMOP 56; London, 1987), 173–91.

[14] *Journal of the Society of Glass Technology* 38, 443T.

high porosity. A high degree of vitrification reduces this porosity and hence increases the thermal flow. The mechanical stability meanwhile is maintained by the less vitrified parts between the 'hot spots'. This heating method is confirmed by the design of the crucible. Its flat bottom bears the weight of the charge, while the almost perpendicular walls are less burdened, and the walls are as thin as possible to allow a maximum heat flow.

Furthermore, a thermally induced convection may have developed within the crucible, with hot glass rising at the walls and cooler glass descending in the middle of the crucible. This would lead to a further mixing of the melt, depending on its viscosity and the actual time available at high temperature. Since glass has a softening interval rather than a melting point, it is essential to bring the temperature of the melt as high as possible to allow gas bubbles to escape and to homogenise the charge within a reasonable length of time. A direct contact of the charge with the burning charcoal would, of course, provide the highest heat; it would also, however, not only pollute the glass, but probably reduce the copper oxide to copper metal, which is a much inferior colourant. We have no signs of any direct contact between burning charcoal and the crucible walls.[15] The background heat, therefore, must have been generated at some distance, and we may envisage a domed or closed structure around the crucible to keep in the radiant heat and the hot gases. Oppenheim[16] describes several furnace types employed for glass-making according to Mesopotamian texts of the first millennium BC, including two which resemble reverberatory furnaces. Moorey[17] suggests that these texts may actually go back to much older tradition. Hence, they may well be of relevance for Qantir too, especially with the known intercultural character of this Delta site.[18]

The workshop area of Q I produced a range of different fireplaces, hearths and furnaces, but these are preserved only as burnt areas in the ground. One type may be of significance here, showing a series of heavily fired openings distributed more or less regularly around a central circular feature and with some limited traces of a superstructure. The internal diameter of this type of structure is about 110 cm and the width of the openings is roughly 15 cm. This feature could possibly be reconstructed as a reverberatory furnace, but further research is necessary to unravel possible links between this and the finds of crucible sherds.

To summarise, we must assume that the crucibles stood in a furnace chamber separated from the actual fire, but with some means of directing a flame very locally to selected spots around the base of the vessel. This device may have been a blowpipe directing a blast of fresh air into small heaps of charcoal resting at the base of the crucibles, causing fierce but very localised burning, with the supply of oxygen coming from outside the furnace chamber. On the whole, the 'hot spots' look rather static, but in a few instances, there seems to have been a strong current across the bloating ceramic, elongating the bubbles which formed on the softened surface. It seems unlikely that more than one crucible was heated at any time in such a furnace, since it would need

[15] Signs such as fused and bloated ceramic over large areas of the surfaces exposed to heat are well known from the interior of the Egyptian bronze-melting crucibles; see Pusch, *Ägypten und Levante* 1, 75–113, from Qantir, as well as from the exterior of many Roman and medieval crucibles.

[16] A. L. Oppenheim, R. Brill, D. Barag and A. von Saldern, *Glass and Glassmaking in Ancient Mesopotamia* (Corning, 1970), esp. chapter 3, 'The Technology of Mesopotamian Glassmaking', 69–86.

[17] P. R. S. Moorey, *Ancient Mesopotamian Materials and Industries; The archaeological evidence* (Oxford, 1994), 203.

[18] E. Pusch, 'Ausländisches Kulturgut in Qantir-Piramesse', *SAK, Beiheft* 2 (1989), 249–56.

a rather complex network of air pipes to get the threefold heating pattern around each individual crucible if there was more than one crucible active at a time.

Cooling of the ready-made glass was most probably done by slowly reducing the overall heating of the furnace chamber. The hot crucibles would certainly not have been strong enough to survive any movement, and the glass ingot had to cool at an extremely slow rate to avoid cracking due to internal stress. The contact of oxygen, in the form of hot air, with the surface of the glass in the cooling crucible led to the formation of a black layer on the exposed surface where the cuprite (Cu_2O) was oxidised to tenorite (CuO). This black layer is still visible on top of the Cairo glass ingot from Qantir. Contraction of the glass during cooling led to the slightly concave surface visible on this ingot.

From inspecting this ingot it seems plausible to assume that the crucible walls were chipped off with chisels after cooling, the sherds being discarded immediately. This would also explain why there are no complete crucibles except for those which were not used in the glass-melting operation but as potstands instead.[19] In only two small areas of the ingot had the white layer failed to work properly and stuck to the glass. Is it just coincidence that this patch of white layer is near the base of the ingot, i.e. at a position equivalent to the 'hot spots' of the crucibles and the residues of glass adhering there?

Tell el-Amarna crucibles

The interpretation given above differs significantly from the one given originally by Petrie and often repeated since.[20] This raises the question of whether the finds from Tell el-Amarna and Qantir are really comparable, or belong to different processes. It therefore seemed sensible to consult the original finds upon which Petrie based his interpretation.[21] The crucible fragments studied contained traces of red and blue to black glass, and were similar in every respect to the Qantir material. For example, fragment number 396 at the Ashmolean Museum has glass which clearly runs down the outside from rim to base, while the object in the Petrie Museum labelled UC 8988 gives the impression of a 'hot spot'. Sample UC 25248 contains blue glass inside the vessel with a thickness of up to 1 cm, while UC 36462A has both an external 'hot spot' and a thin layer of blue glass inside, separated from the ceramic by a whitish layer. In our opinion, all the fragments of cylindrical vessels in the two collections are clearly identical in function to those found at Qantir. It was felt, however, that the frequent seeping of glass through cracks at the 'hot spots', resulting in the appearance of glass drops at the base only but without related runners from the rim, may have led Petrie to his impression of glass dripping from other vessels onto the bases of converted crucibles. Only the identification of the cracks, by sectioning, allowed a more plausible explanation of this otherwise hard to interpret feature.

[19] Aston, *Die Keramik des Grabungsplatzes QI*, Teil 1, Nos. 484–5; compare also Nos. 505–10.

[20] P. Nicholson (*Journal of Glass Studies* 37, and *Glass Technology* 36) has already pointed to the inconsistencies in the presentation and interpretation of the crucibles and the process as a whole during subsequent publications by Petrie. Concerning the function of the crucibles, Nicholson came to a view similar to the one presented here from surface finds at Tell el-Amarna (see *Egyptian Faience*, 51).

[21] We are most grateful to Dr Helen Whitehouse of the Ashmolean Museum, and to Barbara Adams and Dr Rosalind Janssen of the Petrie Museum of University College London for providing access to this material in a very helpful manner. The material looked at includes the crucible fragments at the Ashmolean, nos. 1893.1–41 396, 398 and 399, and the pieces at the Petrie Museum labelled UC 8988, 8989, 25248, 36458 and 36462A, B.

The wider range of debris and objects in the two British collections, comprising various 'frits', pieces of flat, low-fired pans, faience moulds, yellowish-white plaster,[22] glass rods and slags indicate that at Tell el-Amarna there was a workshop area similar to that at Qantir-Piramesses, but with a different emphasis. While the evidence for the shaping of glass is restricted to Tell el-Amarna, only Qantir has a complex bronze working industry integrated with the workshop area.

Discussion

The wide range of stratified material relating to high-temperature industries at Qantir and the similar range of surface finds from Amarna strongly indicate that, during the New Kingdom, related crafts were operating in close proximity, forming a complex network of shared materials and resources and specialised knowledge, which produced high quality luxury goods in king-size quantities for the needs of the pharaohs' court. However, this proximity of different types of workshop, the similarity of materials involved and the character of the surviving remains (usually discarded debris) make it difficult to differentiate the material. The assignation of each type of find to a specific process seems to be an urgent task. Not only is further analytical work needed, but also a good deal of luck in unearthing the key pieces and recognising them.

We have no evidence so far from Qantir for the final working of glass. None of the glass canes, found so plentifully at Amarna, came to light, and only a few semi-finished objects or sherds of glass vessels. We have, however, good evidence for the production of about 40 litres, equalling about 100 kilograms, of red glass, a highly specialised commodity, although we do not yet know the duration of production. In any case, from the sheer quantities, one can deduce that site Q I of ancient Piramesses served as a central production site for red glass. It seems not to be coincidence that at the same site we have the remains of the biggest bronze-working factory ever unearthed by archaeologists,[23] as well as evidence for the mass production of faience[24] and the manufacture of Egyptian blue.[25] All these substances have copper as their crucial ingredient, either as the basic metal for alloying, or as the main colourant.

Tell el-Amarna, on the other hand, provides not only strong evidence for the working of glass in the full range of colours, but also for the frequent preparation of various 'frits' and pigments.[26] Obviously, the range of techniques used at Amarna and Piramesses was similar, but with emphasis on different aspects. While Piramesses seems to have specialised in the making of copper-based materials, Amarna played its role as a high quality artists' complex, using the full range of semi-finished materials to produce luxury goods. This distinction may find its explanation in differing goals. Whilst the Amarna workshops were producing luxury goods for direct use in the palace, the Qantir workshops were supplying large quantities of raw materials in an intermediate state which were to be

[22] Nicholson, *Journal of Glass Studies* 37, 15, 19.

[23] See Pusch, *Ägypten und Levante* 1, 75–113, and 4, 145–70.

[24] Hamza, *ASAE* 30, 31–68.

[25] Th. Rehren, 'High Temperature Industries in the Late Bronze Age Capital Piramesse-Qantir: Bronze and Glass Production and Processing', in *First International Conference on Ancient Egyptian Mining and Metallurgy and Conservation of Metallic Artifacts* (Cairo, in press).

[26] F. Weatherhead and A. Buckley, 'Artists Pigments from Amarna', in B. J. Kemp (ed.), *Amarna Reports*, V (EES Occasional Publications 9; London, 1989), 202–40.

further processed on the spot, in connection with the systematic furnishing and enlargement of the new capital, or even for export.

Another highly developed specialisation of ancient Near Eastern glass-making is indicated by the presence of cobalt blue glass on board the Ulu Burun shipwreck.[27] Here, the availability of suitable cobalt ores may have led to the rise of another specialised centre of the glass business. There is no direct evidence for the provenance of the blue glass, but a non-Egyptian origin must at least be considered.[28] The general similarity of the crucible shapes, as deduced from the Ulu Burun glass ingots and the vessels from Tell el-Amarna[29] and from Qantir, may be interpreted as good evidence for a shared technology among the various centres.

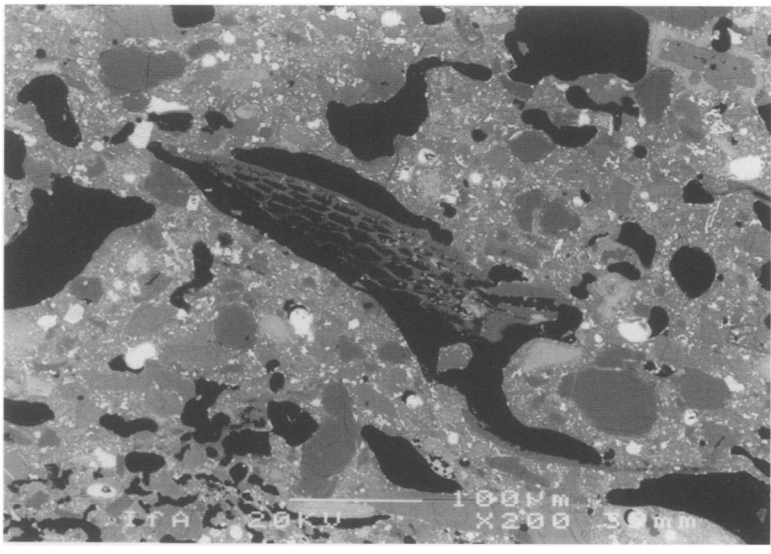
At present, we do not know whether only the colourant was added to ready-made raw glass at these specialised sites, or whether the batch was prepared from the primary ingredients. If the latter was the case, than the various factories obviously stuck very precisely to one and the same formula, probably relying on the same raw materials. Many more analyses of working debris, semi-finished and intermediate materials are needed, and these should be well integrated into archaeological discussions, excavations and stratigraphic data, to get closer to a solution of these questions.

[27] G. F. Bass, 'A Bronze Age Shipwreck at Ulu Burun (Kas): 1984 Campaign', *AJA* 90 (1986), 269–296; id., 'Oldest known shipwreck reveals splendors of the Bronze Age', *National Geographic* 172 (1987), 692–733; C. Pulak, 'The Bronze Age Shipwreck at Ulu Burun, Turkey: 1985 Campaign', *AJA* 92 (1988), 1–37.

[28] The dominant part of the cargo of the Ulu Burun ship was copper in the form of oxhide ingots. This particular type of trade object is well known from many places over the entire Eastern Mediterranean area during the Late Bronze Age. From Egypt we have abundant epigraphic evidence for oxhide ingots, but only one single fragment of an actual ingot, excavated at Qantir (Pusch, *Ägypte und Levante* 1, 92, T. Vb; the correct stratigraphy is B/3; also Pusch, *Ägypten und Levante* 4, 164.) Certainly, Egypt was on the consumer side of the oxhide trade. Bearing this in mind, it seems reasonable to discuss a non-Egyptian origin also for the glass ingots found off the Turkish coast. The similarity in chemical composition between cobalt blue glass from Egypt and from the Ulu Burun wreck points to a common, but not necessarily an Egyptian, origin. It should be stressed, however, that since some of the cargo of the vessel is clearly Egyptian material, an Egyptian origin of the glass ingots is perfectly possible.

[29] Nicholson, *Journal of Glass Studies* 37, 18.

1. Crucible (FZN 83/0660c) showing thick white protective layer covering the inside (*photo A. Opel*)



2. Electron micrograph showing heavily vitrified crucible ceramic with residual organic temper

3. Glass ingot (Cairo JE 64296) from Qantir. Maximum height is 10 cm (*photo A. Herold, courtesy of the Egyptian Museum Cairo*)

4. Crucible fragment (FZN 92/1227) with glass-filled crack at the heel, running from inside out

THE ULU BURUN GLASS INGOTS, CYLINDRICAL VESSELS AND EGYPTIAN GLASS

By PAUL T. NICHOLSON, CAROLINE M. JACKSON *and* KATHARINE M. TROTT

This paper examines a possible Egyptian origin for the glass ingots discovered in the Ulu Burun shipwreck off the Turkish coast and seeks to relate them to cylindrical vessels believed to be ingot moulds from Tell el-Amarna. A preliminary distinction between types of Ulu Burun ingot is also suggested and a comparison made between the ingot moulds from Amarna and those from Qantir.

In their valuable article on 'New Kingdom Glass-melting Crucibles from Qantir-Piramesses' Drs Th. Rehren and E. B. Pusch raise several points of similarity with the well-known cylindrical vessels from Tell el-Amarna.[1] The purpose of this paper is to expand on some of these points, particularly in relation to the idea that there might have been an export trade in glass from Egypt, perhaps as early as the late Eighteenth Dynasty.

Petrie[2] took the view that glass was actually manufactured at Amarna, and on the evidence available, many believed glass to have been an Egyptian invention. This view prevailed into the 1950s, although some scholars such as Harden were already wondering whether soil conditions were responsible for the apparent lack of still earlier glass vessels from Mesopotamia.[3] By the 1960s an Asiatic origin for glass had become established[4] and with it came a change in the way Egyptologists thought of glass. It seems to have become accepted that the glass industry was introduced into Egypt from abroad,[5] perhaps as a result of the bringing back of captive glass-workers following the campaigns of Tuthmosis III. This seems highly plausible in view of the apparent appearance of glassmaking as a fully fledged industry in Egypt at around 1500 BC.

To say that foreign workers established the industry in Egypt is not the same as saying that Egypt was subsequently dependent upon foreign sources—such as imported glass ingots—for her raw material. This, however, has become a commonly held view, and there seems considerable reluctance in some quarters to accept that the Egyptians might have been able to manufacture their own glass from its basic constituents, at least by the time Amarna was flourishing as the capital city.[6]

[1] *JEA* 83 (1997), 127–41. We are grateful to the authors for providing us with a pre-print of their article, and for their comments on an earlier draft of this paper.

[2] W. M. F. Petrie, *Tell El Amarna* (London, 1894).

[3] D. B. Harden, 'Glass and glazes', in C. Singer et al. (eds), *A History of Technology*, II (Oxford, 1956), 318–19; P. R. S. Moorey, *Ancient Mesopotamian Materials and Industries* (Oxford, 1994), 190.

[4] D. B. Harden, 'Ancient glass I, Pre-Roman', *The Archaeological Journal* 125 (1968), 46–72.

[5] A. L. Oppenheim, 'Towards a history of glass in the ancient Near East', *JAOS* 93 (1973), 259–66.

[6] The absence of any suggestion that the Egyptians made their own glass is evident in publications dating after *c.* 1960. R. Newton and S. Davison, *Conservation of Glass* (London, 1989) 107, are more specific: 'There seems to have been no production of glass from its raw materials in ancient Egypt before the fifteenth century BC, and

This is not the place to detail the evidence for glass production at Amarna, either from Petrie's work[7] or that currently taking place on behalf of the EES.[8] Suffice it to say that there are numerous finds which suggest that *glassmaking*, as distinct from *glassworking*,[9] was taking place at the site.

Cylindrical vessels

Rehren and Pusch note the similarity between cylindrical vessels ('crucibles') from Qantir and those from Amarna (Table 1). The vessels at both sites have a similar external base diameter and are made from Nile clay thrown on the potter's wheel and lined with a white parting layer. At both sites the vessels appear to be connected with the production of glass, and the discovery by Rehren and Pusch that a discoloured red glass ingot now in the Cairo Museum,[10] fits almost exactly cylindrical vessels from Qantir tends to confirm the view, already suggested by Nicholson,[11] that such vessels may be regarded as ingot moulds. There also seem to be differences between the vessels at the two sites, and these may actually be reinforced by the ingot itself. It will be noted that the ingot has a rounded profile, and that it is some 10 cm in thickness. Whilst it fits the mould with complete profile from Qantir, it would stand proud of either of the complete profiles so far discovered at Amarna. Its diameter is also smaller, as examination of the selection of vessels illustrated by Weatherhead and Buckley[12] makes clear. Whilst the two complete profiles of Amarna vessels (Table 1, Cat. 1 and 3) both have a total height of 11.0 cm or less, the complete example from Qantir (FZN 84/0088) is 13 cm tall and two of the incomplete vessels are themselves 12 cm tall. None of the Amarna vessels so far examined approaches this height. The external base diameter is comparable at both sites, as is the rim diameter.

A series of these cylindrical vessels from Amarna is currently being examined, and preliminary investigation suggests that there may be two or three variants. These range from vessels which are virtually true cylinders with quite sharp angles between the walls and base on the interior (type A) to those which are more curved (type B). An intermediate group has also been distinguished (type A/B). The impression gained from examining several of the Qantir specimens in photographs, and as presented at lectures, is that a higher proportion of them have the rounded profile, although we appreciate that examples with more angular walls also exist.

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it is generally considered that the Egyptians had failed to learn the secret of glass-making (and this is borne out by the finds at Tell el-Amarna), despite the fact that they were skilled makers of glass articles (i.e. glassmelters) from glass cullet which had been imported from Upper Syria.' See also E. M. Stern and B. Schlick-Nolte, *Early Glass of the Ancient World 1600 B.C.–A.D. 50* (Ostfildern, 1974), 25.

[7] Petrie, *Tell El Amarna*, 16–28.

[8] P. T. Nicholson, 'Glassmaking and glassworking at Amarna: some new work', *Journal of Glass Studies* 37 (1995), 11–19; id., 'Recent excavations at an ancient Egyptian glassworks: Tell el-Amarna 1993', *Glass Technology* 36/4 (1995), 125–8; id., 'New evidence for glass and glazing at Tell el-Amarna (Egypt)', *Annales du 13e Congrès de l'Association pour l'Histoire du Verre* (Amsterdam, 1996) 11–19.

[9] In glassmaking, glass is formed from its raw materials (silica, alkali and lime) whilst in glassworking it is re-melted from ingots or cullet.

[10] Cairo JE 64296. See Rehren and Pusch, *JEA* 83, 135.

[11] *Journal of Glass Studies* 37, 17–18; *Glass Technology* 36/4 (1995), 128.

[12] F. Weatherhead and A. Buckley, 'Artist's pigments from Amarna', in B. J. Kemp (ed.), *Amarna Reports*, V (EES Occasional Publications 9; London, 1989) 202–40.

A number of the Amarna vessels contain traces of cobalt blue glass on the interior, as well as drips of glass on the exterior. Although other colours are known, including turquoise blue and green, the cobalt blue seems to be the predominant colour. In some cases glass has caused the rim of one cylindrical vessel to adhere to the base of another, suggesting that they might have been stacked. It has also been found that a slight chamfer around the base of some vessels would allow them to have been fitted into one another in a stack. So far as we are aware, these features have not yet been observed at Qantir.

TABLE 1. *Summary Measurements of Cylindrical Vessels from Amarna*

Catalogue number	External base diameter (cm)	Percentage preserved	Height preserved (cm)	Rim diameter (cm)	Percentage preserved	Type	Context
1.	16.0	38.0	9.2 (complete)	18.0	10.0	A	Surface. S. Palace Dumps
2.	14.0	38.0	9.7+	—	—	A	Surface. King's House
3.	16.5	27.0	11.0 (complete)	18.0	6.0	A	Surface. Main City
4.	14.0	14.0	6.5+	—	—	A/B	Surface. S. Palace Dumps
5.	20.0	20.0	8.9+	—	—	A	Surface. S. Palace Dumps
6.	20.0	18.0	4.4+	—	—	B	Surface. Main City
7.	14.0	15.0	5.7+	—	—	B	Surface. O45.1
8.	18.0	21.0	3.1+	—	—	A	Surface. S. Palace Dumps
9.	14.0	40.0	4.7+	—	—	A/B	Surface. S. Palace Dumps
10.	14.0	25.0	6.0+	—	—	B	Surface
11.	16.0	13.0	5.5+	—	—	A	Surface. Main City
12.	18.0	29.0	6.1+	—	—	B	Surface. S. Palace Dumps
13.	18.0	15.0	5.5+	—	—	A	Surface. S. Palace Dumps
14.	14.0	13.0	5.6+	—	—	A	Surface. SW of Q44.1
15.	Fragment only—no useful measurements preserved						Surface. EES dig house
16.	Fragment only—no useful measurements preserved						Surface. W. of M50.14
17.	18.0	4.0	—	—	—	A	Surface. S. Palace Dumps
18.	—	—	—	18.0	8.0		Surface. Central City
19.	—	—	—	17.0	9.0		Surface. S. Palace Dumps
20.	—	—	—	16.0	8.0		Surface. S. Palace Dumps
21.	—	—	—	16.0	10.0		Surface. nr. O45.1
22.	16.0	12.0	4.2+	—	—	A/B	Surface. nr. M50.14
23.	16.0	15.0	—	—	—	A?	Surface. nr. M50.14
24.	18.0	14.0	4.5+	—	—	A	Surface. nr. M50.14
25.	18.0	18.0	4.2+	—	—	A	Surface. nr. M50.14
26.	18.0	12.0	3.7+	—	—		O45.1 K80 [7998]
27.	17.0	32.0	3.4+	—	—	A	O45.1 K80 [7998]
28.	16.0	30.0	4.5+	—	—	A	O45.1 L75 [9026]
29.	17.0	28.0	5.0+	—	—	A	Surface. Q75
30.	—	—	—	18.0	8.0		O45.1 K80 [7966]
31.	Fragment only—no useful measurements preserved						O45.1 L80 [7974]
32.	Fragment only—no useful measurements preserved						O45.1 M75 [8979] Obj.30655
33.	Fragment only—no useful measurements preserved						O45.1 M75 [8981] Obj.30656
34.	Fragment only—no useful measurements preserved						O45.1 L75 [8979]
35.	Fragment only—no useful measurements preserved						O45.1 L75 [8979]
36.	16.0	5.0	3.2+	—	—	A	O45.1 K85 [7962]
37.	Fragment only—no useful measurements preserved						O45.1 M75 [8979] Obj.30550
38.	Fragment only—no useful measurements preserved						O45.1 M75 [8981] Obj.30591

(Approximate measurements of the type collection of cylindrical vessels currently held at Amarna.)

The presence of 'hot spots' on the vessel walls noted by Rehren and Pusch may well be significant at Amarna too. There are certainly areas of such overfiring on some of the vessels, but examination of those fragments held in the type collection at Amarna, and observed on the palace dumps, has failed to reveal any regular pattern consistent with the three 'hot spots' recognised in the Qantir examples. This may be due in part to the different type of glass being produced. Red glass, which predominates at Qantir, demands extremely careful regulation of furnace conditions, whilst the blue glass most commonly produced at Amarna is less demanding.

Craft integration and the use of cobalt

At present there is no evidence from site O45.1 (that currently under investigation) at Amarna for metalworking but, as both we and Rehren and Pusch[13] note, the Amarna finds made by Petrie may instead have been associated with the production of faience and of pigment, and this is borne out in the new work. In addition to glass manufacture, the current excavations have also yielded very clear evidence for the production of pottery, in the form of a clay preparation area, unfired sherds and a pottery kiln. This grouping may suggest a crafts quarter based around ceramics and pigments. Such a grouping might be particularly advantageous if the well-known Amarna blue painted pottery was being manufactured in such an area. As yet there is no firm evidence for the manufacture of blue painted pottery at site O45.1. However, the colouring material used for this pottery is known to have been cobalt,[14] and there is extensive evidence for the use of cobalt colorant in the making of glass, blue pigment and possibly faience at the site.

Until recently it was not widely accepted that cobalt occurred in workable deposits in Egypt. However, work by Kaczmarczyk[15] has shown that an exploitable source of cobaltiferous alum was available, and has countered arguments by Dayton[16] that the source of cobalt was European. Several industries (pottery production, glassmaking, pigment manufacture and faience production) may have been located together since they shared similar technologies and used cobalt as a colorant.

If we accept an Egyptian origin for cobalt, and accept the argument put forward some time ago for the Amarna cylindrical vessels as ingot moulds[17] along with that convincingly stated by Rehren and Pusch for the Qantir 'crucibles', then one must reconsider whether or not the Egyptians could actually *make* glass, that is, produce it from its raw materi-

[13] *JEA* 83, 139–41.

[14] J. Riederer, 'Recently identified Egyptian pigments', *Archaeometry* 16 (1974), 103–9.

[15] A. Kaczmarczyk, 'The source of cobalt in ancient Egyptian pigments', in J. S. Olin and M. J. Blackman (eds), *Proceedings of the 24th International Archaeometry Symposium* (Washington D.C., 1986) 369–76; id., 'The identity of *wšbt* alum', *JEA* 77 (1991), 195.

[16] J. E. Dayton, 'Cobalt, silver and nickel in Late Bronze Age glazes, pigments and bronzes, and the identification of silver sources from the Aegean and the Near East', in M. J. Hughes (ed.) *Scientific Studies in Ancient Ceramics* (London, 1981), 129–42; id., 'Geological evidence for the discovery of cobalt blue glass in Mycenaean times as a by-product of silver smelting in the Schneeberg area of the Bohemian Erzgebirge', *Revue d'Archeometrie (Supplement)* 3 (1981), 57–61.

[17] See n. 8 above. See also W. E. S. Turner, 'Studies of ancient glass and glass-making processes. Part I. Crucibles and melting temperatures employed in ancient Egypt at about 1370 B.C.', *Journal of the Society of Glass Technology* 38 (1954), 436–44T.

als.[18] It could be that raw glass was imported into Egypt and simply re-melted when it had the cobalt colorant added to it, in which case the crucibles/ingot moulds would simply be convenient vessels in which to carry out this process. The finished ingot would then be sent to other workshops in the city of Amarna, or, indeed, elsewhere in Egypt. However, recent work suggests that the situation might be more complicated.

The current programme of excavation at Amarna is being accompanied by experimental archaeology and scientific analyses and, combined with the apparent scale of the operation at Amarna, suggests that glass could actually have been made at the site. That being so, the ingots may not have been destined only for local use.

The Ulu Burun ingots

The blue glass ingots discovered in the Ulu Burun shipwreck off the Turkish coast, and now undergoing conservation at the Museum of Underwater Archaeology in Bodrum, offer considerable insights into this question of trade. A cast of one of the cobalt blue ingots was made available to us[19] and in March 1996 was taken to Amarna where it was found to fit as perfectly as possible[20] into several of the more complete cylindrical vessels from Amarna (fig. 1 and pl. XVII, 2). Comparison of 1:1 scale drawings of the Qantir ingot with three[21] of those of cobalt blue ingots from Ulu Burun also shows some differences. The three Ulu Burun ingots are all of greater diameter than that from Qantir, by up to 2 cm. On the other hand, the Qantir ingot is considerably deeper from top to bottom, by up to 3 cm. The impression gleaned from these drawings was borne out in the preliminary examination of several of the actual Ulu Burun ingots (fig. 2 and Table 2).

In July 1996 Trott and Nicholson were able to visit the Museum of Underwater Archaeology at Bodrum and to measure a selection of the ingots.[22] Of the 24 ingots measured, only five had an upper diameter smaller than that of the 13 cm example from Qantir; all the rest were larger. These five clearly came from moulds smaller than those so far known from Amarna. In all cases the maximum thickness of the Ulu Burun ingots was less than the 10 cm of the Qantir example. It will be obvious from this that none of the Ulu Burun ingots examined in any way resembled that known from Qantir.

There is also a further distinction to be made among the Ulu Burun pieces themselves. Although the measurements were taken rapidly and no attempt was made to select ingots randomly, there does seem to be a division by size and colour (fig. 1). Where the ingots are believed to be coloured using cobalt,[23] they are generally larger, typically having an

[18] The difference between a 'crucible' and an 'ingot mould' is largely semantic. If the ingot is set in its crucible, then the crucible has become an ingot mould, whereas if it were melted in such a vessel and the melt removed into some other vessel, it would be simply a crucible.

[19] P. T. Nicholson is most grateful to Professors Bass and Pulak for providing him with drawings of several of the Ulu Burun ingots. He is similarly indebted to them, and to their colleagues Jane Pannell and Claire Peachey, for making a cast of ingot KW4.

[20] Obviously any given ingot will only match precisely the actual mould in which it was produced.

[21] These are ingots KW3, KW4, and KW34.

[22] They are grateful to Prof. Pulak for permitting this visit and allowing the publication of these provisional results, as well as to C. Peachey for facilitating access to the material.

[23] At present it is not possible for the excavators to say with certainty what the precise number of ingots is (since many are fragmentary) nor what their original colours were (as many are completely hydrolysed and have lost their original colour). Most of the ingots are currently undergoing conservation. We are indebted to Prof. Pulak for a provisional estimate that there are approximately 170 ingots in total and that the predominant colour is cobalt blue. There are, however, 21 certain examples of turquoise blue and one purple ingot.

upper surface diameter exceeding 13 cm. The maximum thickness is also distinctive, with the cobalt ingots generally having thicknesses above 3.5 cm, and usually above 5.0 cm, while those coloured with copper are typically 3.5 cm in thickness. The upper-surface diameter for the ingots believed to be coloured with copper is usually below

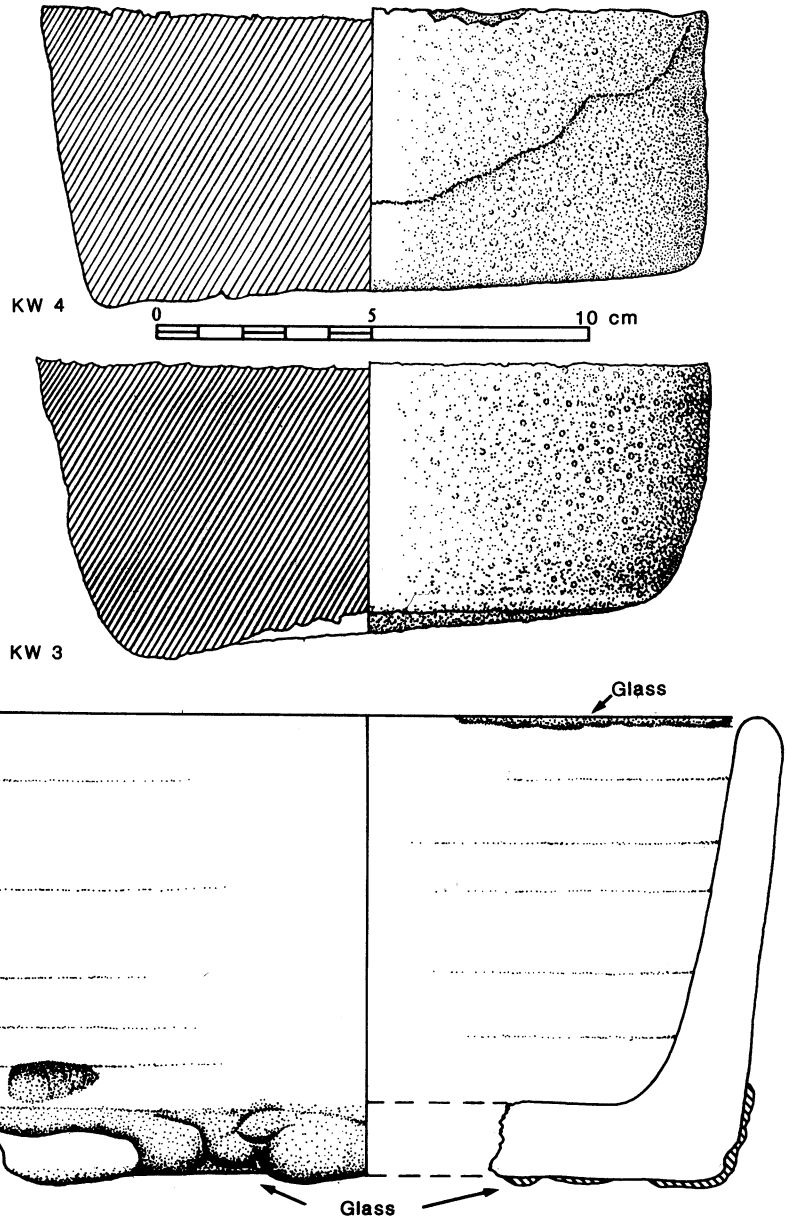


FIG. 1. An Amarna cylindrical mould (Surface find Main City No.3) shown with Ulu Burun ingots KW3 and KW4, which match its profile well. Like any traditional wheel-thrown vessel, the mould is not truly circular; the diameter of this one is approximately 18.0 cm. (Ingot drawings courtesy of Profs G. Bass and C. Pulak, drawing by Ian Dennis.)

13 cm, and the maximum recorded is 13.5 cm. For the ingots coloured with cobalt the upper-surface diameter can be up to about 15.5 cm.[24] Whilst this evidence alone might suggest that the ingots would fit moulds from either Amarna or Qantir, other considerations suggest that moulds of the Amarna type might be more likely.

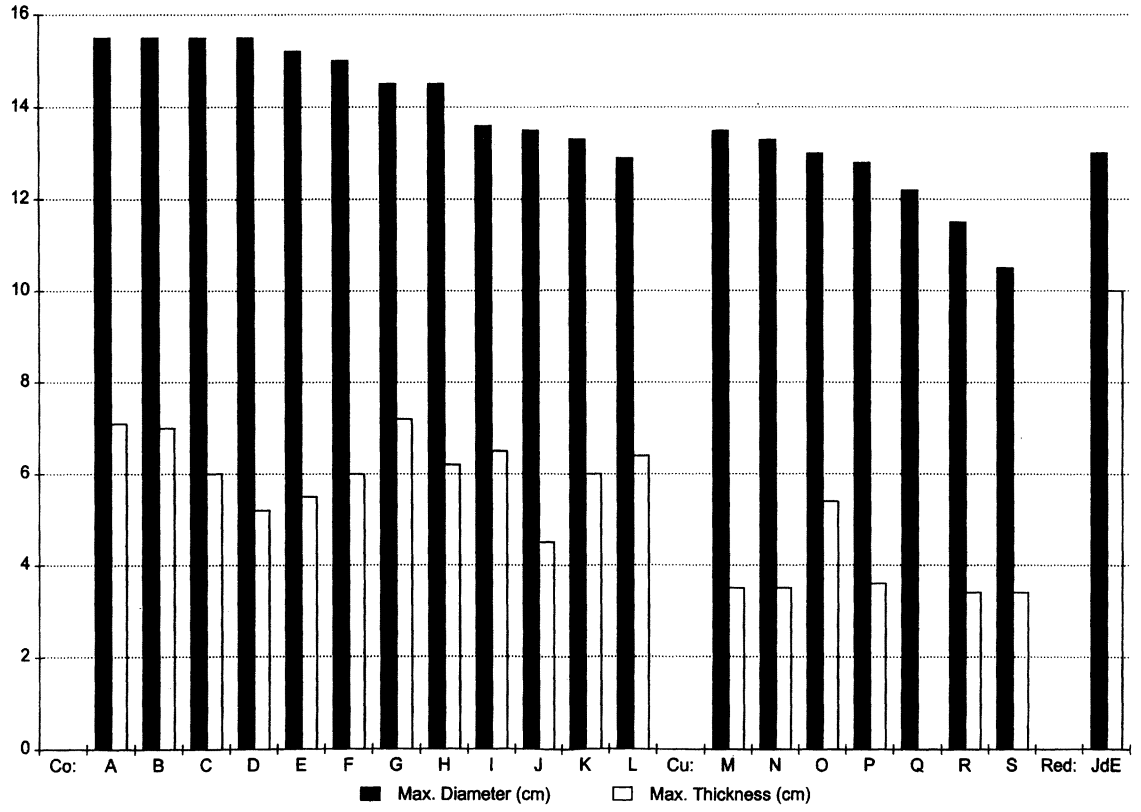


FIG. 2. Bar chart showing the differences in maximum diameter (solid black bar) and maximum thickness (shaded bar) for those Ulu Burun ingots provisionally thought to be coloured by cobalt and by copper respectively compared to the discoloured red glass ingot from Qantir. Those coloured by copper tend to be smaller and thinner than those coloured by cobalt. The proportions of the Qantir ingot are markedly different from any from Ulu Burun. (Figure prepared by Walter Gneisinger.)

Co = presumed cobalt colorant Cu = presumed copper colorant

A = KW3 (measured from drawing only)
B = KW4
C = KW3086
D = KW4758
E = KW2501
F = KW3189
G = KW3132
H = KW3685
I = KW34 (measured from drawing only)
J = KW10120
K = KW3485
L = KW3214
M = KW4532
N = KW4425
O = KW4218 (may be coloured with Co)
P = KW2923
Q = KW3034
R = KW762
S = KW1896
JdE = JE 64296 from Qantir

[24] It should be stressed that the measurements are provisional and a fuller study must await the completion of conservation.

The profile of the Ulu Burun ingots is generally smooth and their vertical walls are not badly chipped, as on that from Qantir, suggesting that they parted more easily from their moulds.[25] They also show profiles like those of Amarna mould types A and B. Another notable difference is that the upper surface of the Qantir ingot is almost flat,

TABLE 2. *Comparison of Ingot Measurements (cm) from Ulu Burun and Qantir*

Probably coloured by cobalt	
KW3 (measured from drawing)	
Max. diam.	15.5
Max. th.	7.1
KW4	
Max. diam.	15.5
Max. th.	7.0
KW3086	
Max. diam.	15.5
Max. th.	6.0
KW4758	
Max. diam.	15.5
Max. th.	5.2
KW2501	
Max. diam.	15.2
Max. th.	5.5
KW3189	
Max. diam.	15.0
Max. th.	6.0
KW3132	
Max. diam.	14.5
Max. th.	7.2
KW3685	
Max. diam.	14.5
Max. th.	6.2
KW34 (measured from drawing)	
Max. diam.	13.6
Max. th.	6.5
KW10120	
Max. diam.	13.5
Max. th.	4.5
KW3485	
Max. diam.	13.3
Max. th.	6.0
KW3214	
Max. diam.	12.9
Max. th.	6.4

Probably coloured by copper	
KW4532	
Max. diam.	13.5
Max. th.	3.5
KW4425	
Max. diam.	13.3
Max. th.	3.5
KW4218 (may be coloured with Co)	
Max. diam.	13.0
Max. th.	5.4
KW2923	
Max. diam.	12.8
Max. th.	3.6
KW3034	
Max. diam.	12.2
Max. th.	not recorded
KW762	
Max. diam.	11.5
Max. th.	3.4
KW1896	
Max. diam.	10.5
Max. th.	3.4
Red (discoloured to green) ingot from Qantir	
JE 64296	
Max. diam.	13.0 (as reconstructed by Rehren and Pusch)
Max. th.	10.0

[25] It is, of course, possible that the Qantir ingot has suffered greater secondary damage prior to burial, and as a single example, little weight can be put on this.

whereas those from Ulu Burun are often vesicular and uneven. The underside of the Ulu Burun ingots is slightly concave, reflecting the convex interior of the moulds, and again suggesting that they parted easily from these, and several examples show the casts of the potter's finger marks so noticeable on the interior of the moulds from Amarna.

The Amarna vessels tend to be found in quite large pieces, perhaps indicating that the ingot they contained could usually be separated from them with ease, a view which may be supported by the fact that comparatively few of them contain extensive traces of glass. This relatively clean profile accords well with the profile of the Ulu Burun ingots themselves, and begs the question of whether the ingots came from Amarna. This is certainly not to argue that the Qantir and Amarna vessels had a different function, but rather to note the similarity of the Amarna vessels to the Ulu Burun ingots (fig. 2). Rehren and Pusch[26] have drawn our attention to the fact that some of the Qantir moulds have similar rim diameters to the Amarna examples, and if filled to the average depth of the Ulu Burun ingots, they would produce ingots of a similar diameter. However, the apparent depth of the Qantir moulds along with the evidence of the surviving ingot and the predominance of red, rather than (cobalt) blue, glass at that site tend to argue against Qantir as a source for the Ulu Burun ingots.

Possible origin and date of the Ulu Burun ingots

Rehren and Pusch state that, 'Certainly Egypt was on the consumer side of the [copper] oxhide trade. Bearing this in mind, it seems reasonable to discuss a non-Egyptian origin also for the glass ingots found off the Turkish coast. The similarity in chemical composition between cobalt blue glass from Egypt and from the Ulu Burun wreck points to a common, but not necessarily an Egyptian, origin.'[27] So far as we are aware, full details of the chemical analyses of the Ulu Burun ingots have not yet been published, although a note by Bass[28] states that Dr R. H. Brill of the Corning Museum found the ingot he examined 'identical in content to blue glass in Egyptian bottles and Mycenaean medallions dating from the same period as the shipwreck'.[29] If we accept that the cobalt source used at this time was Egyptian and not European, then it is not unlikely that the source of the ingots was Egypt.[30] Whether or not it was Amarna is a much more difficult question, although recent dating evidence might make such a link more likely.

Weinstein[31] discusses the dates of the Egyptian finds from the Ulu Burun wreck at some length. Among the finds are several Amarna pieces, including a gold scarab of Nefertiti. There are, however, other Egyptian objects dating to the Second Intermediate Period, and Weinstein makes a case for many of the Egyptian items being old at the time of their deposition, probably on their way to be melted down. He dates the wreck to the late fourteenth or early thirteenth century BC 'to the late 18th Dynasty or at latest the

[26] Personal communication.

[27] *JEA* 83, 141, n. 28.

[28] G. F. Bass, 'Oldest known shipwreck reveals splendors of the Bronze Age', *National Geographic* 172 (1987), 692–733.

[29] Ibid. 718.

[30] The source of the ingots need not be the same as that of the base glass from which they were made, but experimental work (below) lends weight to the view that they may indeed be Egyptian.

[31] G. F. Bass, C. Pulak, D. Collon and J. Weinstein, 'The Bronze Age Shipwreck at Ulu Burun: 1986 campaign', *AJA* 93 (1989), 1–29.

very beginning of the 19th'.[32] Recent dendrochronological evidence puts the wreck at 1316 BC, a date roughly midway between Amarna and the date of the Qantir cylindrical vessels. However, there is no Ramesside material from the Ulu Burun wreck, and a date of 1316 BC would also indicate an Eighteenth Dynasty date[33] according to most chronologies. This would tend to suggest that the Ulu Burun ingots predate the glassworking evidence so far known from Qantir.

Conclusions

To sum up, there is a predominance of red glass at Qantir, whereas the cylindrical vessels from Amarna are mainly associated with cobalt blue glass. Cobalt blue is the predominant colour of the ingots recovered from Ulu Burun. On present evidence, the cylindrical vessels from Qantir seem to be taller than those from Amarna, and the preserved ingot is similarly tall. The ingots measured from Ulu Burun are several centimetres shorter. Finally, the new dating of the Ulu Burun wreck suggests a date in the late Eighteenth Dynasty, something already suggested by the lack of Ramesside material recovered from it.

In the absence of published analyses, it cannot categorically be demonstrated that the Ulu Burun ingots came from Amarna.[34] However, the evidence must seriously lead us to consider the possibility that the ingots are to be dated to a period in the late Eighteenth Dynasty, when moulds of the Amarna type were in use, and that they might even have come from that site. We would in any case suggest that even during the lifetime of Amarna some of the ingots made at that city were destined for minor workshops elsewhere in the settlement and at other sites in Egypt. It is equally possible that, following the abandonment of the site, the glassmakers of Amarna were moved to other royal centres such as Thebes or Memphis, and that that was where the ingots were cast.

If this view is correct, and the ingots are both Egyptian and to be dated to the late Eighteenth Dynasty, then we must reconsider the position of Egypt in terms of the history of glass and of Mediterranean trade at this time. We feel that it has been assumed for too long that the Egyptians did not make their own glass, let alone export it as raw material.[35] This more complicated view of trade accords well with the picture of craft integration suggested by Rehren and Pusch for Qantir and which Nicholson has put forward elsewhere for Amarna.[36] It is becoming increasingly clear that ancient crafts were closely integrated and that their practitioners shared many technologies in common.

[32] Ibid. 24.

[33] Reported at the meeting of the Archaeological Institute of America in December 1995: see J. Eisenberg, 'Archaeological news from San Diego', *Minerva* 7/2 (1996), 49.

[34] However, only in exceptional circumstances can analyses of glass be used to give a precise source of production.

[35] Whilst this paper has dealt with the possible export of raw glass from Egypt, the position of the trade in finished glass vessels remains ambiguous: see, for example, E. J. Peltenburg, 'Ramesside Egypt and Cyprus', in V. Karageorgis (ed.), *Acts of the International Archaeological Symposium 'Cyprus Between the Orient and the Occident'* (Nicosia, 1986), 149–79, esp. 153.

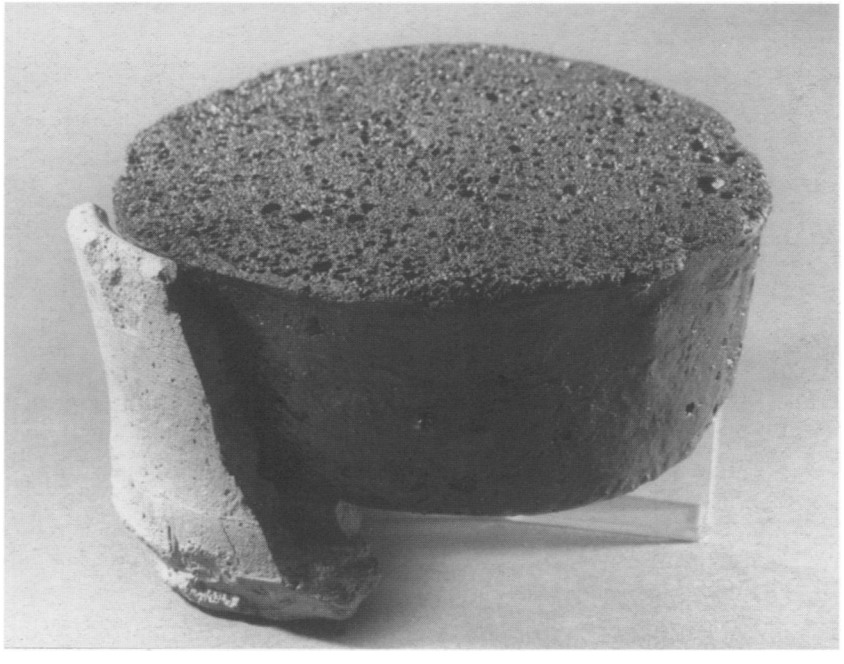
[36] P. T. Nicholson, *Ancient Egyptian glass and its relationship to faience and other manufactures: A 'vitreous materials industry'?* (unpublished dissertation, University of Manchester Dept. of Extra-Mural Studies, 1993). Links between crafts have also been examined by D. Stocks, *Industrial technology at Kahun and Gurob: Experimental manufacture and test of replica and reconstructed tools with indicated uses and effects upon artefact production* (unpublished MPhil thesis, University of Manchester, 1988); id., 'Making stone vessels in ancient Mesopotamia and Egypt', *Antiquity* 67 (1993), 596–603.

Analytical work by Jackson, Nicholson and Gneisinger at the University of Wales, Cardiff,[37] and by M. S. Tite and A. Shortland at Oxford is designed to clarify these craft relationships and elucidate the technological stages of glass production. A programme of experimental archaeology is also underway and lends support to this view.[38] A full report on the work at Amarna site O45.1, outlining the reconstruction of glass technology at the site, is planned for the near future.

[37] Generously supported by the Leverhulme Trust, grant number F407J.
[38] Jackson and Nicholson, in preparation.

1. Two ceremonial tails lying on the bottom of the gold coffin, from the pubis to halfway down the shins (*photograph by H. Burton: GI neg. 793, reproduced by permission of the Griffith Institute, Oxford*)

TUTANKHAMUN'S CARNELIAN SWALLOW WITH SUN DISC (pp. 109–25)



2. Cast of the Ulu Burun ingot KW4 in cylindrical vessel 1, a surface find from Tell el-Amarna

THE ULU BURUN GLASS INGOTS, CYLINDRICAL VESSELS AND EGYPTIAN GLASS (pp. 143–53)

AN ORACULAR AMULETIC DECREE OF KHONSU IN THE CLEVELAND MUSEUM OF ART

By BRIANT BOHLEKE

CMA 14.723 (= P. Cleveland 14.723) belongs to the genre of texts known as Oracular Amuletic Decrees, compositions promulgated by deities to protect the wearer from physical and spiritual dangers. Although the surviving corpus is homogeneous in nature and of limited chronological scope, it is part of a larger 'inoculation programme' to protect juveniles from childhood diseases, accidents and premature death.

IN 1960 I.E.S. Edwards published the fourth series of the *Hieratic Papyri in the British Museum,* stating that he had collected from various museums all known examples of the Oracular Amuletic Decrees, and presuming that others lying undiscovered would eventually be published.[1] Thirty-seven years have elapsed since he wrote this prophecy, and not one has appeared in print until now.

Of the twenty-one known decrees, seven were written for male recipients and fourteen for female ones. No titles are borne by those named, and no one named can be connected for certain with documents or artefacts from other sources. It is thought that the recipients might have been young children for whom the new parent sought protection.[2] The provenance of only one decree (C. 1) is claimed to be known, being 'said by Mariette to have been found in the sand at Saqqara'.[3] Considering that temples to the oracle-generating gods named in the decrees are all known to have been present at the Karnak precinct, it is most likely that the provenance, or at least the origin, of the corpus was Thebes. Edwards suggested an early Twenty-second Dynasty date for the corpus on the basis on one document (L. 7) mentioning a pharaoh Osorkon.[4] However, elements of some of the orthographies hint that at least a portion of the corpus dates from the Twenty-first Dynasty.[5]

To quote Edwards, the Oracular Amuletic Decrees are 'presented as divine declarations regarding the fortunes of their owners'.[6] Homogeneous in form and subject matter, they are declarations by a god or gods promising that the oracle will be fulfilled, having been composed and designed to protect the owner from various ills and mishaps. Oracular Amuletic Decrees offer insight into the hopes and fears of the living regarding the divine forces—benign or hostile—which governed the mundane experiences of

[1]I.E.S. Edwards, *Hieratic Papyri in the British Museum, Fourth Series: Oracular Amuletic Decrees of the Late New Kingdom* (London, 1960), hereafter abbreviated Edwards, *OAD*. To the *JEA* referees I proffer my thanks for their criticisms and suggestions for additional bibliography, both of which have benefitted this article greatly.

[2]Ibid. xv. See also n. 42 below.

[3]Ibid. xiii. For the sake of brevity and clarity, Edwards' convention for designating the papyri will be used throughout this article.

[4]Ibid. xiii–xiv.

[5]Y. Koenig, 'Notes de transcription', *CRIPEL* 9 (1987), 31.

[6]*OAD*, xiv.

mortal life and ultimate fate of the individual. As Edwards pointed out,[7] these texts contain words, concepts, and references to religious documents (e.g. the various books of fate) rarely, if ever, found elsewhere.

The decrees are narrow in relation to their length and are composed in the manner of private letters from the late Ramesside Period: the text is begun on the face with the fibres running vertically because they are in a sense private letters from the deity to the devotee.[8] The narrow strip of papyrus on which the promise was written was tightly rolled, bound with a flaxen cord, and placed in a container made from one of a variety of materials such as gold,[9] wood, or leather, the medium varying according to the financial resources at the devotee's disposal. Carved or formed in one piece, the containers are hollow cylinders open at the bottom and in one instance surmounted by the heads of the deities who made the oracular proclamation. Behind the heads an eyelet juts out for the suspension cord. A stopper fitted into the bottom of the container would have secured the contents while the container was suspended on the cord and worn on the chest by the devotee as a phylactery. Some papyri were still bound with their original thread when they were found in their containers.[10] All further details concerning the published Oracular Amuletic Decrees can be found in Edwards' thorough publication.

Papyrus Cleveland 14.723 (fig. 1 and pl. XIX)[11]

Purchased from Joseph Hassan Ahmed of Luxor by Lucy Olcott Perkins through Henry W. Kent on March 31, 1913, the papyrus was donated to the Cleveland Museum of Art by the John Huntington Art and Polytechnic Trust. CMA 14.723 is a thin strip approximately 3 cm wide by 18.5 cm long. It preserves 36 lines of text on one side, almost all of which is intact except for what is lost in the various small and two larger lacunae on the right of the papyrus. The size of the lacunae increases from top to bottom, indicating that the papyrus was rolled from top to bottom, leaving the beginning of the text shielded and less vulnerable to injury. The oracle of protection is delivered by Khonsu-in-Thebes Neferhotep to a male child (?), the name of whose mother follows. This text is the second shortest of the genre, which range from 33 lines (P. 5) to comprehensive promises of 240 lines (T. 2).

[7]Ibid. xxi–xxii.

[8]Ibid. xii.

[9]J.M. Ogden, 'Cylindrical Amulet Cases', *JEA* 59 (1973), 231–3; J. Ray, 'Two Inscribed Objects in the Fitzwilliam Museum, Cambridge', *JEA* 58 (1972), 251–3; J.D. Bourriau and J.D. Ray, 'Two Further Decree-Cases of *Šꜣk*', *JEA* 61 (1975), 257–8, pl. xxix. The text inscribed on the decree case in the Fitzwilliam Museum reads, 'Words spoken by Khonsu-in-Thebes Neferhotep, he having made good protection [for] Shaq, the justified', while Louvre E. 3316 attributes the same promise as having come from 'Amonrasonthēr, the good god, lord of heaven'. (Perhaps the verb is more likely to be a nominal *sḏm.n=f* than the circumstantial *sḏm.n=f* as translated.) The presence of Isis of Coptos as guarantor on Louvre E. 3317 cautions that not all Oracular Amuletic Decrees were issued at Thebes. Ray (*JEA* 58, 252 n. [n]) suggested that the name Shaq might have been an abbreviation for 'Sheshonk'. Because the gold regions of Nubia had been lost to the Egyptians at this time, the reuse of this material would have been even more limited than in previous generations. Alhough untitled, the owner of the precious decree case would necessarily have been a young member of a very select elite.

[10]Edwards, *OAD*, xviii–xix. P. 4 was found inside a wooden container carved with the heads of a human-headed Mut and falcon-headed Khonsu. T. 1 and T. 2 were encased in leather containers.

[11]I would like to thank Dr Lawrence M. Berman, Assistant Curator of Ancient Art, The Cleveland Museum of Art, for granting to me his kind permission to study and publish this papyrus.

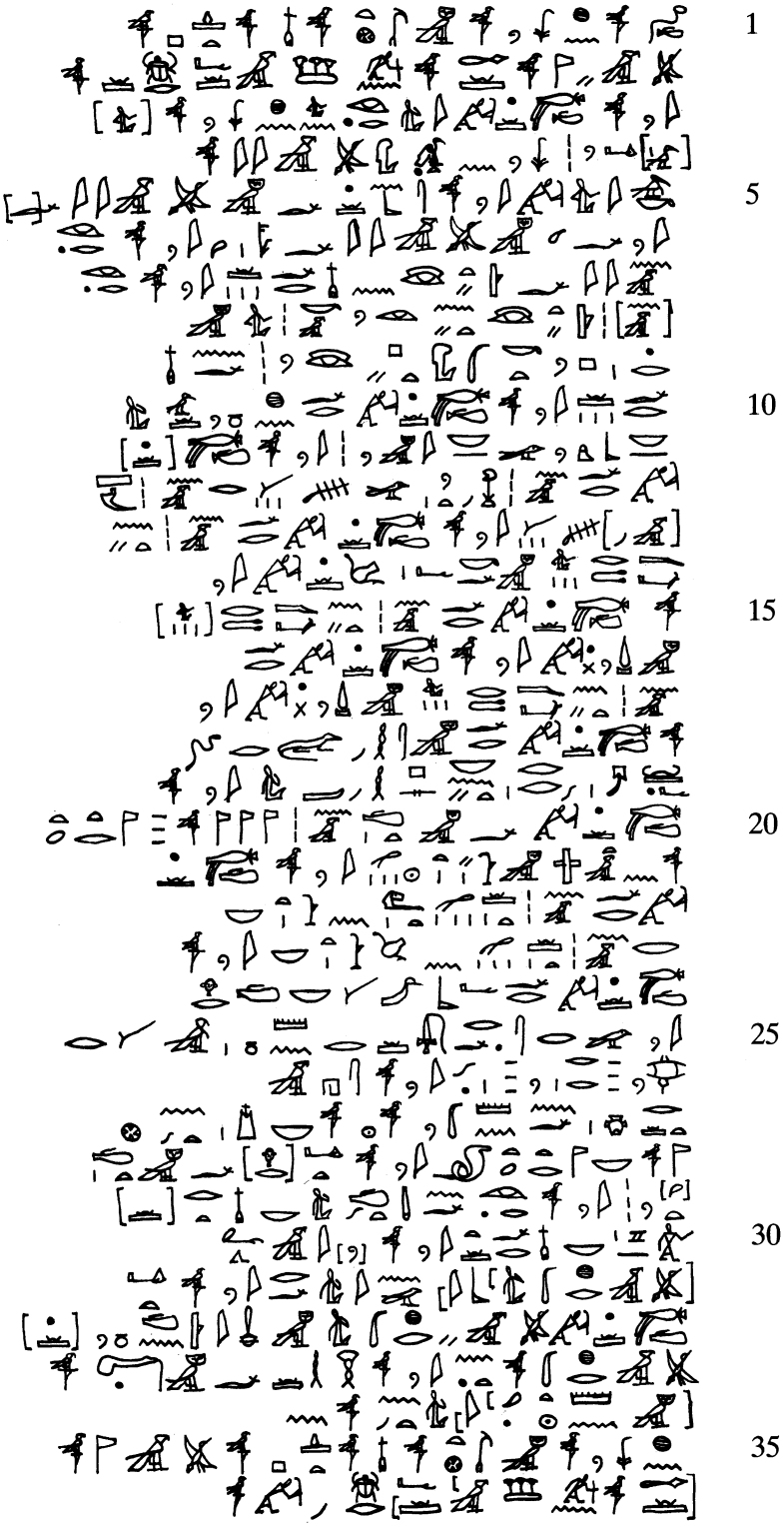


Fig 1. P. Cleveland 14.723.

The hand is bold, small, and cursive, the text proving somewhat more difficult than it initially appears. Parallel texts among the corpus assisted in reconstructing the hieratic, though words in the Cleveland example show differing or unique orthographies (fig. 2).

(1) *ḏd Ḥnsw m Wꜣs.t Nfr-ḥtp*	Said Khonsu-in-Thebes Neferhotep
(2) *pꜣy nṯr ꜥꜣ smsw n šꜣꜥ Ḫpr*	the[a] great god, the oldest who was the first to come into existence:[b]
(3) *iw = i šd 'I-ir = i-n.Ḥnsw*	I shall protect Irenkhonsu,[c]
(4) *[sꜣ] Di = w-sw-n-Mwt pꜣy = i*	[son of] Diuesenmut, my
(5) *bꜣk iw = i snb = f m pꜣy = f*	servant. I shall keep him healthy in his
(6) *iwf m pꜣy = f qs iw = i ir(.t)*	flesh and in his bone(s).[d] I shall make
(7) *nꜣy = f qty n nfr.w iw = i ir(.t)*	his dreams good; I shall make
(8) *nꜣ qty nty irw kꜣ.w m*	those dreams which another man
(9) *r-pw k.t pty = w n = f*	or another woman shall see for him
(10) *nfr.w iw = i šd = f r ḫn.w*	good.[e] I shall protect him from every slander,
(11) *nb btꜣ nb im = w iw = i šd =*	and every injustice thereof. I shall protect
(12) *= f r nꜣ ḫꜣy.tiw r nꜣ šm-*	him from the demons and from the gremlins.[f]
(13) *-ꜣ.yw iw = i šd = f r nꜣ nty*	I shall protect him from any who
(14) *tꜣi rmṯ m kfꜥ iw =*	seize a man through capture.[g] I
(15) *i šd = f r nꜣ nty tꜣi rmṯ*	shall protect him from those who seize someone
(16) *m ḏꜣw iw = i šd = f r*	stealthily. I shall protect him from
(17) *nꜣ nty tꜣi rmṯ m ḏꜣw iw =*	those who seize someone stealthily.[h] I
(18) *i šd = f r msḥ r(ꜣ)*	shall save him from a crocodile, a serpent,[i]
(19) *wḥꜥ.t r rꜣ nb nty psḥ iw = i*	a scorpion, and from any mouth which bites.[j] I shall
(20) *šd = f m-ḏr.t nꜣ nṯr.w nṯr.(w)t*	protect him from the gods and goddesses
(21) *n tꜣ imy rnp.t iw = i šd =*	of the (book) 'That-which-is-in-the-year'.[k] I shall protect
(22) *f r nꜣ mḏꜣ.wt ḥꜣ.t n rnp.t nb*	him from all the books of the beginning of the year
(23) *r nꜣ mḏꜣ.wt n ph rnp.t nb iw = i*	and from all the books of the end of the year. I shall
(24) *šd = f r ꜥb nb dḥr-*	protect him from every disorder,[l] sickness,
(25) *-i r srf rmn r*	from fever,[m] illness, and from
(26) *tꜣwrrw iw = i shꜣ-*	flatulence.[n] I shall
(27) *-r-ib n = f Mntw-Rꜥ nb 'Iwn.t*	propitiate for him Montu-Re, lord of Armant,[o] (and)
(28) *nṯr nb ntr.t iw = i di.t [ḥr] = f m-ḏr.t =*	every god and (every) goddess. I shall guard him[p] from
(29) *= w iw = i ir(.t) n = f md.t nb nfr.t*	them. I shall provide for him everything good (and)
(30) *nis(?) nb nfr.t iw = i wiꜣ*	every good recitation(?).[q] I shall ward off[r]
(31) *[pꜣ ḫr.ti] bin i-r = f iw = i di.t*	[the] bad [oracle] from him.[s] I shall cause
(32) *šd pꜣy ḫr.ti m mi-qdw*	that this oracle protect (him) and likewise
(33) *pꜣ ḫr.ti nty iw = i wꜣḥ = f m-bꜣḥ*	the oracle which I shall place in the presence
(34) *[m-mn.t(?)] i.n = tw n*	[daily].[t] So one said,[u] namely
(35) *Ḥnsw m Wꜣs.t Nfr-ḥtp pꜣ nṯr*	Khonsu-in-Thebes Neferhotep, the great god,
(36) *ꜥꜣ smsw n šꜣꜥ Ḫpr*	the oldest who was the first to come into existence.

Commentary

(a) As Edwards, *OAD*, 51 (T. 1) n. 2 notes, the alternating use of the definite article with the demonstrative adjective in epithets placed in apposition after personal names has been treated by B. Gunn, 'The decree of Amonrasonthēr for Neskhons', *JEA* 41 (1955), 88, §I, n. 5.

(b) Khonsu-in-Thebes Neferhotep is the sole giver of the oracle in P. 5, lines (1–2) (cf. Edwards, *OAD*, 93 n. 1); L. 2, rt. 1 (cf. ibid. 13 nn. 1–2); and L. 4, lines (1–2), 26–7. This god also appears as oracle-giver in conjunction with other deities such as Mut (P. 2, vs. 3; P. 4, 1–2, 43–5), Mut and Amon (T. 1, rt. 1–6), and Mut, Montu-Re, Maat, and others (T. 3, rt. 1–9). From the 'theocratic' Twenty-first Dynasty come major religious and legal oracular proclamations which share style, divine epithets, and vocabulary with the Oracular Amuletic Decrees.[12]

[12]J. Černý, 'Egyptian Oracles', in R.A. Parker, *A Saite Oracle Papyrus from Thebes in the Brooklyn Museum* (Providence, 1962), 36, 38–40; M. Römer, *Gottes- und Priesterherrschaft in Ägypten am Ende des Neuen Reiches* (ÄAT 21; Wiesbaden, 1994), 138, 153, 163f, 219 n. 321, 244, 249f, 252–4, 360f; J.-M. Kruchten, *Le grand texte oraculaire de Djéhoutymose* (MRE 5; Brussels, 1986), 63–5, 88, 118f, 151, 155f, 187, 222, 341–3, 349–54; H.-W.

The type of oracular pronouncements guaranteeing continued existence to a living person are reflected in the appearance at the beginning of the Twenty-first Dynasty of the name Djedkhonsuiuefankh, 'Khonsu said "he shall live" '. This idea is fleshed out more explicitly in the Oracular Amuletic Decrees, during the period of which this name (and others similarly constructed)[13] was in vogue.

Khonsu's reputation as a font of oracular decisions goes back at least as far as the time of the high priest Herihor.[14] The use of oracles for assuring the living of their personal safety is attested contemporaneously in letter 14 of the Late Ramesside Letters,[15] which records the fearful concern the residents of the workmen's community at Thebes bore for their senior scribe Tjaroy, who had been forced into accompanying general Piankh on his military expedition into Nubia. The concern of the homesick Tjaroy was placed before the god Amenhotep at each of the deity's public processions, the writer asking the god for an oracular statement and seeking reassurances that Tjaroy would return unharmed. The god is recorded to have said, 'I will protect him; I will bring him back safely, and he will fill his eye with my forecourt'. In the line prior to this, Amon of the Thrones of the Two Lands is said to have saved (*šd*) the venerable scribe; this is the verb used most frequently in the Oracular Amuletic Decrees.

The reputation of Khonsu and other deities such as Sobek and Imhotep as oracular guardians was still active when the Demotic self-dedication texts were written during the Ptolemaic Period.[16] From the second century BC a number of papyri found among the archives of the temple of Sobek at Tebtunis have the appearance of legal contracts. In them the suppliant undertakes to become a servant (*bꜣk*) on the temple lands of the god, paying a monthly protection fee to be guarded against supernatural influences. In the majority of instances the suppliant is a boy or girl whose mother is named and the father described as 'I know not his name'. In return, the god is asked by the petitioner: 'protect me, guard me, protect me from every evil spirit, every sleeping man, every drowned man, and every dead man'.[17] Perhaps making the child the ward of the temple foundation was society's way of caring for 'illegitimate' children or those whom the mother could not financially support.[18] There is no indication in the texts of the Twenty-second Dynasty Oracular Amuletic Decrees that the concept of contractual cloistering or temple 'foster home' care for the illegitimate had evolved. This may have been a much later development. The adult intermediary in the Oracular Amuletic Decrees, however, may have made some sort of donation to the temple in return for the divine promises.[19]

Fischer-Elfert, 'Two Oracle Petitions Addressed to Horus-Khau with Some Notes on the Oracular Ameletic Decrees (P. Berlin P. 8525 and P. 8526)', *JEA* 92 (1996), 129–45. For a royal oracular petition of the Twenty-second Dynasty found on a statue fragment of a king, see H.K. Jacquet-Gordon, 'The Inscriptions on the Philadelphia-Cairo Statue of Osorkon II', *JEA* 46 (1960), 12–23, pls. vii–viii.

[13]Edwards, *OAD*, xx n. 1; examples include Mut, Ptah, Amon, Anhur, Osiris, Bastet, Maat, Montu, Nefertum, Hapy, Horus, and Thoth. For the possible formations of this name, see H. Ranke, *Die ägyptischen Personennamen*, III (Glückstadt, 1977), 15f, and Černý, in Parker, *Saite Oracle Papyrus*, 43.

[14]*The Temple of Khonsu*, II (OIP 103; Chicago, 1982), 14–17, pl. 132.

[15]J. Černý, *Late Ramesside Letters* (BAe 9; Brussels, 1939), 28, lines 3–6.

[16]J.D. Ray, 'Papyrus Carlsberg 67: A Healing-Prayer from the Fayûm', *JEA* 61 (1975), 181–8, pl. xxv; cf. especially p. 186 for the reference to Khonsu.

[17]H. Thompson, 'Two Demotic Self-Dedications', *JEA* 26 (1941), 68–78, pls. xii–xiii. P. Turin 1993 vs. 7,6–10,1 (W. Pleyte and F. Rossi, *Papyrus de Turin* (Leiden, 1876), pls. cxx,5–cxxii,10; J.F. Borghouts, *Ancient Egyptian Magical Texts* (Leiden, 1978), 4–6) preserves a 'royal decree' promulgated by Osiris Khentamentiu for driving away male dead, female dead, and protection from a long list of types of death through malfunctioning body parts, noxious animals, violence, gods, and premature birth.

[18]For a thorough study of consigning authority over a child to an institution, a practice known as oblation, see J. Boswell, *The Kindness of Strangers: The Abandonment of Children in Western Europe from Late Antiquity to the Renaissance* (New York, 1988). The author does not treat any ancient Egyptian evidence for oblation, but pp. 237f refer to some Coptic documents pertaining to this practice.

[19]One could even later seek an answer from the god, either alone or via the medium of a young boy. The vessel inquiry spell of Khonsu-in-Thebes Neferhotep, from the third century AD London and Leiden magical papyrus, recognizes the curative powers of the god. At one point the magician chants, 'You should save me and make me

(c) Employing the Second Tense, the name of the beneficiary translates 'It is to Khonsu that I belong'.[20] The formation of the name is paralleled by that of the tomb robbers Ir(i)enamon in P. Leopold II-Amhearst 2:3,[21] Ir(i)enmontu in P. BM 10054,[22] and an Ir(ien)bak, a contemporary of the end of the Twenty-first Dynasty and the issuance of the Oracular Amuletic Decrees.[23]

Only enough space for a small group or more likely, a single hieratic sign exists at the beginning of line 4. A trace of ink before the first preserved sign and a diagonal stroke appearing from the lower left corner of the lacuna are all that remain of the same sign of which they were a part. Since the writing of *pȝ* in the text otherwise includes the *aleph*-bird, and this article would directly precede the *di*, it could not have been present, for the traces do not fit the shape of the *aleph* complement. If the female determinative is not a mistake for a male determinative, the feminine article *tȝ* might have begun the name. But here, too, the traces do not support such a suggestion. Therefore, the proposition can be advanced that the sign might not belong to the parent's name, in which case it could represent filiation, the common means of effecting this in the corpus being *pȝ/tȝ šri n* or *mw.t=f* N. The traces do not fit the first scenario, while the second is only a possibility if the group is the highly abbreviated form used in T. 3, rt. 114 and L. 5, rt. 6. (In other texts the same group of diagonal stroke under dot/open circle designates only the word *mw.t*, the suffix pronoun being an additional sign; e.g. P. 2, rt. 3; P. 1, rt. 11; T. 2, vs. 4, 63, 116.) The other option is to read the missing sign group as the pintail duck (A.H. Gardiner, *Egyptian Grammar*[3], Sign List no. G 39), attested in the corpus only once (as feminine *sȝ.t*) in P. 3, vs. 22. The parent's name would be an unattested Diusuenmut/Diuesenmut.

The sex of the parent presents a minor problem. The determinative is clearly female, but there is much careless interchange between the male and female determinative in hieratic texts of this period, depending on the inclusion or absence of the tick. The dependent pronoun *sw* renders either the feminine or masculine,[24] and statistically the extant Oracula Amuletic Decrees show no significant preference for gender when only one parent is mentioned.[25] So for the time being, credence must be given to the presence of the female determinative, rendering the mother's name Diuesenmut, the translation of which is 'She has been dedicated to Mut', a reasonable assertion considering her residence, her son's association with Khonsu, and the prominence of the Theban triad in issuing Oracular Amuletic Decrees. As in the other decrees, neither child nor mother bears any titles whatsoever or is known from other documents.

The oracular aspect of the forms of Khonsu are highlighted in the later Bentresh stela, the Ptolemaic pseudo-epigraphic work carved and set up in a small temple near that of Khonsu at Karnak.[26] The tale is set in the time of Ramses II, who is shown offering incense before the barque of Khonsu-in-Thebes Neferhotep. The story relates how a princess of the ruler of Bakhtan had been seized by a malady, so the pharaoh sent a learned man from the 'House of Life' for a prognosis, and this individual deduced that the woman was possessed by an evil spirit. The prince once more beseeched Ramses, who reported the difficulty to Khonsu-in-Thebes Nefer-

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well. ... Save me! Let me be healthy. ...You should save me from every [misery?] and all confusion'. Cf. *PDM* xiv. 239–95, in H.D. Betz, *The Greek Magical Papyri in Translation, including the Demotic Spells*[2] (Chicago and London, 1992), 209–13.

[20]J. Černý and S.I. Groll, *A Late Egyptian Grammar*[2] (StudPohl 4; Rome, 1978), 382–3 §26.18.6 and especially §26.19.

[21]*KRI* VI, 483, 9; see too Ranke, *PN* I, 39.16 corrected in *PN* II, 343.

[22]*KRI* VI, 495, 9.

[23]Koenig, *CRIPEL* 9, 32; A.M. Blackman, 'The Stela of Shoshenk, Great Chief of the Meshwesh', *JEA* 27 (1941), 85, 90 n. 54, pl. x line 6 (= stela line 13).

[24]Černý and Groll, *LEG*[2], 22.

[25]Where the parents' names are mentioned, nine examples cite both parents, four the mother, and three the father.

[26]Stela Louvre C 284 from Karnak; cf. P. Tresson, 'Un curieux cas d'exorcisme dans l'antiquité. La stèle égyptienne de Bakhtan', *RB* 42 (1933), 57–78, pl. i. An overview of the history of Khonsu *pȝ ir shr(.w)* has been treated in G. Posener, 'Philologie et archéologie égyptiennes', *Annuaire du Collège de France* 65 (1965), 342f; 66 (1966), 339–42; 67 (1967), 345–9; 68 (1968), 401–7; 69 (1969), 375–9; 70 (1970), 391–6.

Cl	L.1	L.2	L.3	L.4	L.5	L.6	L.7	T.1	T.2	T.3	P.1	P.2	P.3	P.4	P.5	C.1	C.2	NY	Ch	Ph	B
1-2		rt. 92-93		26-27				rt. 2-4		rt. 2-3				2-[3]	[1-3]						
		vs. 31-32						vs. 36-37													
		vs. 56-57																			
3-5																					
5-6		rt. 4		31-32	rt. 8-9	rt. 7-8		rt. 9-11	rt. 5-6	rt. 12-13			rt. 6-7		5-7	7-8	rt. 19-20	rt. 7-8	5-6	A 2-4	[rt. 2-3]
								vs. 42-43													
6-10		vs. 44-47				rt. 11-14		rt. 17-26	rt. 10-13	rt. 18-21		rt. 4-7	rt. 13-17	5-8		70-73		(rt. 60-61)	(69-76)	A 4-7	rt. 6-8
10-11	rt. 23-24					vs. 87-88						rt. 8-9	rt. 22-23			90-92	rt. 14-16	rt. 55-56	54-55		
												rt. 12-15	rt. 76-78								
11-13	rt. 47-49				vs. 8-10	rt. 48-49		vs. 6-7	rt. 42-44			rt. 15-16	rt. 98-100	11-13	23-26	22-24	rt. 16-17	rt. 27-29	22-24	B 2-4	
									rt. 76-78					19-20				rt. 32-34			
13-14	rt. 38-39	rt. 78-80		19-21				rt. 85-86	rt. 16-17			rt. 21-22	rt. 50-53								rt. 38-40
14-17								rt. 84-85				rt. 20-21									rt. 35-36
17-19		rt. 6-8		16-18	vs. 37-41	vs. 10-13		rt. 72-76		rt. 84-89		rt. 10-12	rt. 85-87	31-33		66-69	rt. 38-vs. 3	rt. 47-50	47-51	D 7-10	
19-21		rt. 77-78	B 13-14			rt. 52-53		vs. 12-14	rt. 26-27			rt. 16	rt. 47-48			24-25		rt. 35	26-27	B 4-6	rt 25-26
21-23	rt. 21-22	rt. 54-56						vs. 25-27	vs. 20-22			rt. 18-20	rt. 95-98								rt. 23-25
23-26	vs. 43	rt. 9-11			vs. 43-47	rt. 103-105			rt. 79-80	rt. 25-27		rt. 7-8		29	14-17	47-48		rt. 37-39	41-44		
	(*t3wrrw*)				vs. 51-52					rt. 32											
					(*t3wrrw*)					(*t3wrrw*)											
26-29	vs. 31-32				vs. 23-24	vs. 57-58	7-9	rt. 65-66	rt. 86-87	rt. 66-68		rt. 29-30				54-56		rt. 25	21-22		rt. 10
					vs. 28-31		20-21	rt. 69-70	rt. 94-95							83-89					
									vs. 104-105												
29-30	rt. 74-75							rt. 29-30			vs. 1-2					(42-43)			76-77		
								rt. 35			vs. 6-7										
30-31						vs. 43-45															
31-34	(vs. 52-57)					vs. 51-52	62			(vs. 1-3)	vs. 14-17				19-21	20-22		rt. 69-72	65-66		
							70														
34-37		rt. 92-93		26-27				rt. 2-4		rt. 2-3				2-[3]	[1-3]						[rt. 96]
		vs. 31-32						vs. 36-37													
		vs. 56-57																			

FIG. 2. Concordance to P. Cleveland 14.723.

hotep. The god conferred with Khonsu the Contriver (*p; ir shr.w*), one of whose specialties was the expulsion of disease demons. The image of Khonsu-in-Thebes Neferhotep gave his assent for his other aspect to be dispatched to Bakhtan, and conferred his magical protection on the travelling god. Upon arriving in Bakhtan, Khonsu the Contriver cured the princess Bentresh immediately. After celebrating a feast-day with the now-sated demon, and employing a dream to frighten the ruler of Bakhtan out of delaying his stay in that country, Khonsu the Contriver returned home with his gifts, which he presented to Khonsu-in-Thebes Neferhotep.

Khonsu the Contriver and Khonsu-who-was-a-Child are mentioned in six Oracular Amuletic Decrees. They are described as baboons seated on the right and left of Khonsu-in-Thebes Neferhotep, and once as belonging to the temple of Khonsu. There must have been a sanctuary within the temple in which a cult statue of Khonsu was flanked by two images of baboons representing these gods.[27] In the Oracular Amuletic Decrees the two deities were regarded as entities against whom protection was promised by the god giving the oracle. The two are represented as issuing (*ti pr*) books publishing a person's fate (L. 1, rt. 5–6; L. 6, rt. 66–7; T. 1, rt. 56–7; B., rt. 58–9).[28]

(d) Protection of flesh and bones in tandem is one of the most common promises in the decrees (see fig. 2). Edwards states that the promises of the Oracular Amuletic Decrees pertain only to this life and have no bearing on the conceptions of the next life.[29] While this is textually true, their preservation may point toward their inclusion in burials, a context which indicates a presumed usefulness in the next world.[30]

It is curious that in the Book of the Dead the protection of flesh and bones is secured together only in Spells 163 and 164, the prefatory title to which states that they and Spell 165 are 'Spells brought from another document as additions to Going Forth by Day [found in the temple of Amon-Re, lord of the Thrones of the Two Lands...]'. Most popular in the Late Period papyri from Thebes, the three spells grant an important funerary role to Amon and Mut unparalleled elsewhere in the Book of the Dead, and must have been composed in Thebes or another cult centre of theirs such as Tanis.[31]

For flesh and bones to stay sound like those of a living person, Spell 164 should be said over a drawn image of Mut with three faces and wrapped around the breast, analogous in effect to an Oracular Amuletic Decree case with Mut's carved head on it used as a pectoral. Further, no *rs*-snake will consume the user of this spell, who is said not to die.[32] Spell 163 likewise keeps flesh and bones safe from worms and any hostile gods in the netherworld. However, the spell affords benefits, as it says, even if the roll is used upon earth.[33] Thus, at least two of the three members of the Theban triad protect the adherent in this life and after death. Therefore these spells which

[27]Fragments of such a statue have been found in a courtyard of the temple of Khonsu. Further, fragments of an earlier stela bearing the story of Bentresh have been excavated in the same area. (Personal communication from Prof. Lanny Bell.)

[28]Edwards, *OAD*, 1–2, nn. 1–3, distinguishes between the two deities usually recording personal fates, as opposed to determining them, specifically in B., the significant grammatical difference for Edwards apparently being the use of the *r* of purpose: 'those who issue a book of death and life' (L. 1, rt. 5–6) versus those 'who issue a book ... in order to make to live' (B., rt. 58–9).

[29]Ibid. xix; Römer, *Gottes- und Priesterherrschaft*, 266–9.

[30]A small wooden amulet addressed to an infant god preserves in hieratic the request, 'May you rescue Nebnetjeru, son of Horsiese, from it. They shall not transgress because I shall protect (him) from every bad and evil thing'. Close to the Oracular Amuletic Decrees in date and function, it was excavated from a Twenty-second Dynasty tomb in the Ramesseum; cf. Y. Koenig, 'Une petite stèle-amulette en bois', *BIFAO* 87 (1987), 255–63, pl. xlv.

[31]M. Mosher, 'Theban and Memphite Book of the Dead Traditions in the Late Period', *JARCE* 29 (1992), 155f and n. 57. The prefatory title suggests Tanis as the find spot of the three spells. This royal residence in the Third Intermediate Period had a precinct of Amon, Mut, and Khonsu modelled after that of Thebes, but on a smaller scale. It is plausible the texts were kept there, having been generated by its own priesthood or that of the long-standing centre of Amon worship in Thebes.

[32]T.G. Allen, *The Book of the Dead or Going Forth by Day* (SAOC 37; Chicago, 1974), 160–1.

[33]Ibid. 159–60.

augment the Book of the Dead are correlates of the Oracular Amuletic Decrees, and it is tentatively suggested that they either share a contemporary theological origin, having been composed by priests of Karnak or Tanis during the Third Intermediate Period and the ascendancy of Amon-Re,[34] or are later developments of those concepts found in the Oracular Amuletic Decrees.

(e) Dream incubation for communicating with deities, deceased relatives, and for prognostication is well attested as early as the First Intermediate Period to at least the end of paganism. Books for interpreting dreams are known in hieratic and Demotic.[35]

(f) The *ḥꜣy.tiw* and *šmꜣ.yw* usually appear in tandem in the decrees (see fig. 2). The orthography of the former is unique to the Cleveland papyrus and is an unusually full writing, the closest parallel being found in T. 1, vs. 7. The signs of *šmꜣ.yw* in the lacuna at the beginning of line 13 must be small because they are completely missing. This precludes the *m*-owl from being present. Therefore the spelling must include either an *aleph* and stroke(s) or merely multiple strokes, an orthography similar to that found in L. 6, rt. 49 and NY, rt. 29, 34 respectively. For a discussion of the nature of these creatures, see Edwards, *OAD*, 5–6 nn. 36–7.

(g) See ibid. 4–5 n. 30.

(h) The duplication of this sentence most likely indicates a transcription error of a stock promise from a large selection found on a template from which the absent-minded scribe drew his options. This promise occurs otherwise only in T. 1, P. 2, and B. (see fig. 2). The repetition of a sentence is attested in L. 1, vs. 69. For the translation 'stealthily', see ibid. 54 n. 40.

(i) At the end of the line the signs are less likely to be read as the determinative  going with the crocodile than  .[36] The *r*, though missing the necessary stroke, is one of the writings in the Oracular Amuletic Decrees for 'snake' and cannot be the preposition, which does not precede 'scorpions' either. If the *r* were the preposition, it would force a unique situation in the decrees where the various words for an ophidian are not spelled out.

(j) The divine determination of fate, the noxious agents used to effect it, and the malleability of the outcome are key elements in Egyptian tales such as *The Doomed Prince*, in which the Hathors (Fates) determined that the king's son would die by either a crocodile, a snake, or a dog.[37] Receiving protection from the first two is one of the goals of the Oracular Amuletic Decrees.

Entitled 'Good songs to drive away the swimming one (= crocodile)', Papyrus Harris Magical 501[38] contains hymns and adjurations invoking various gods to spear, drive off, seal up, or overthrow aquatic vermin. Following these are 'magical' formulae with instructions on how to protect the traveller on land or water from noxious reptiles, fanged felines and canines, and unfriendly humans. Among the spells is one which the chief lector priest says is not to be revealed because it is a secret of the House of Life; thus, like the decrees, 'popular' spells for protection were transmitted from priestly sources.

The use of ground garlic mixed with beer and sprinkled around the house is found in a

[34]J. Yoyotte, 'Contribution à l'histoire du Chapitre 162 du Livres du Morts', *RdE* 29 (1977), 200, attributes the origin of these spells to the Ramesside Period. Mosher, *JARCE* 29, 155 n. 58, notes that the earliest attestations of Spells 163–5 are Twenty-sixth Dynasty. The codification of the Book of the Dead occurred during the Saite Period, using for the most part material already in existence.

[35]P. Vernus, 'Traum', *LÄ* VI, 745–9; W. Westendorf, 'Tempelschlaf', *LÄ* VI, 411; D. Wildung, 'Heilschlaf', *LÄ* II, 1101–2; W. Westendorf, 'Sanatorium', *LÄ* V, 376–7. Sending/thwarting dreams and seeking revelations in dreams are common endeavours in the *PGM* and *PDM*. Some of the more salient examples of such spells are *PGM* III. 162–3; IV. 2500–19, 3172–208; VII. 407–10; XII. 121–43, 153–60; *PDM* xiv. 1070–7, Suppl. 1–6, 7–18, 19–27, 28–40, 40–60, 60–101, 101–16, 117–30.

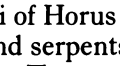
[36]For a discussion of the same hieratic sign and the instances in which Edwards preferred transcribing it as the animal-pelt determinative, see *OAD*, 104–5 n. 33.

[37]M. Lichtheim, *Ancient Egyptian Literature: A Book of Readings*, II (Berkeley, 1976), 200–3.

[38]H.O. Lange, *Der magische Papyrus Harris* (Det Kongelige danske Videnskabernes Selskab. Historisk-Filologiske Meddelelser 14. 2; Copenhagen, 1927).

prophylactic prescription against snakes, scorpions, and any reptile that stings or bites. Originally this must have been composed on papyrus, yet it has been transferred to the medium of a limestone stela of Ptolemaic date to be used for the protection of a deceased god's father named Wennefer.[39]

Stone cippi of Horus were set up in public areas of temple precincts for the defeat of scorpions, crocodiles, and serpents, and to guarantee a cure for their bites or venom.[40] One large cippus was erected in the Twenty-fifth or Twenty-sixth Dynasty at the temple of Mut at Luxor, and there is evidence that others also existed at the nearby temples of Amon, Montu, and Opet. The rare rubric to the cippus text A[41] gives directions for the manufacture and consecration of the stelae, adding that should one be put at the throat of a man, it would, among other benefits, ward off biting snakes. The cippi texts state that it is the god who speaks in the spells and that their words of power effect the cure; similarly, it is the written proclamation of the gods in the Oracular Amuletic Decrees that wards off dangers. To relieve the pain of a scorpion sting, *PGM* VII. 193–6 instructs the magician to write characters on a clean piece of papyrus and wrap it around the affected area.

(k) Most vexing is  . Are the hieratic signs intended to be read  or maybe an unattested  '(The book) That-which-is-in-the-year-and-month'? Perhaps the two groups after the year sign are best explained as dittography.

P. Leiden I 346 preserves a 'Book of the Last Day of the Year', a spell addressing major gods and those who slaughter for Sekhmet.[42] The suppliant beseeches them to be powerless and far from him by identifying himself with various gods and attaining power over other deities so that he might preserve himself from the plague. The spell directs that it should be said over a piece of linen on which gods are drawn, and then the linen placed at the throat. The spell is to be recited from the last day of one year to the opening day of the next. Perhaps the sanguine nature of the gods mentioned in the book 'That-which-is-in-the-year' was of a similar ilk to that in this book and to those in the 'Book of the Five Epagomenal Days', also in P. Leiden I 346.

(l) Edwards transcribed either  or  depending on slight differences in sign shape. The shape of the sign in the Cleveland papyrus is more consonant with the latter.

(m)  is otherwise always written  in the corpus. See the Egyptian word index in Edwards, *OAD*, 125.

(n) *ṯ;rrw* may be Edwards' 'flatulence(?)' (see ibid. 11 n. 29), considering the personal nature of the disorders. It occurs three other times in the corpus (see fig. 2) and the ending is different from the transcription in the Cleveland papyrus. Edwards posits that the phonetic *w*, known to him only in L. 1, could be a scribal error due to confusion with the writing at this period of the preposition with third person plural pronominal suffix. However, it occurs here also, diminishing the possibility that it was unintentional. Cleveland employs the orthography of L. 1, vs. 43 and adds the colourless determinative of T. 3, rt. 32. Although Edwards thought it difficult to imagine to what the suffix referred, perhaps the word parallels such a private name as 'Inaros', which translates 'may the eye of Horus be against them' (Ranke, *PN* I, 42, 11), a Late Period reference to the eye of Horus acting as the eye of Re raging against mankind. Other imprecatory proper

[39]Stela Ny Carlsberg Glyptothek Æ.I.N. 974, in M. Mogensen, *La glyptothèque Ny Carlsberg: La collection égyptienne*, I–II (Copenhagen, 1930), 340–1, pl. cxvi (no. A 764); Borghouts, *Ancient Egyptian Magical Texts*, 82–3.

[40]G. Daressy, *Textes et dessins magiques* (CG; Cairo, 1903), 1–37, pls. i–x; see also R.K. Ritner, 'Horus on the Crocodiles: A Juncture of Religion and Magic in Late Dynastic Egypt', in W. K. Simpson (ed.), *Religion and Philosophy in Ancient Egypt*, (YES 3; New Haven, 1989), 103–16. Cippi have also been located in graves and houses; cf. L. Kákosy, 'Horusstele', *LÄ* III, 60–2.

[41]Borghouts, *Ancient Egyptian Magical Texts*, 83–5, 124; Ritner, in *Religion and Philosophy*, 108.

[42]B. Stricker, 'Spreuken tot beveiliging gedurende de schrikkeldagen naar Pap. I 346', *OMRO* 29 (1948), 55–70; Borghouts, *Ancient Egyptian Magical Texts*, 12–14.

names, given at birth, would have served an amuletic function, protecting mother and child from maleficent or disease demons during this critical time.[43]

If the word is to be transcribed *ṯ;rr=w*, one might think of an evil blast of wind blowing no good against the victim. In any case, further instances are necessary in a new context to conclude whether *ṯ;rrw* is to be understood as an internal gastrointestinal attack or a meteorological blast of some pestilence-carrying wind.

(o) This is the only instance among the parallels in which Montu is mentioned specifically as the deity propitiated. *'Iwn.t* is technically Armant, *pace* Edwards, *OAD*, 2 n. 12.

(p) In L. 2, rt. 19 *wḏ;* appears after infinitival *di.t*. However, in the Cleveland papyrus the lacuna is much too small for such a word, and we are perhaps limited to restoring *ḥr*; see ibid. 83 n. 35, where the context also allows the nuance of 'guard'. If nothing is lost in the space, the translation 'I shall place him in their hands' would designate a protective aspect of the gods counter to that otherwise inherent in the decrees.

(q) For the reading and discussion of this word, see ibid. 3 n. 19.

(r) This word is very rare, perhaps merely a variant of *rwi;*. The minute lacuna does not permit the restoration of *r*, but only a very small, narrow sign. For the bibliography of this word, see the works cited in ibid. 83 n. 51; Römer, *Gottes- und Priesterherrschaft*, 424; and add the example in P. DeM I.[44]

(s) Only one parallel for this passage exists in L. 6, vs. 43–5 (although the form also occurs in L. 2, vs. 30f). For this orthography of the 'dative of disadvantage' before a pronoun, see Edwards, *OAD*, 7 n. 47.

(t) Restored from: ibid. 76 n. 63.

(u) L. 1 vs. 50; T. 2 vs. 112 (cf. ibid. 72 n. 62); P. 4, 43; B., rt. 96 (?). The parenthetic use is followed by an *m* in L.1 and T.2 and by an *n* in P. 4, B., and here.[45] The length of the *n* is intended for it to act secondarily as a horizontal space filler.

Pendants consisting of a hollow cylinder of metal capped at each end, one cap having a suspension loop, are a well-known Middle Kingdom feature. Nearly all have been found empty, although one preserved three small amulets and at least three others enclosed

[43]Cf. J. Yoyotte, 'Pharaon Iny, un roi mystérieux du VII[e] siècle avant J.-C.', *CRIPEL* 11 (1989), 123 n. 62, and Koenig, *BIFAO* 87, 262. Note especially the contribution of M. Guentch-Ogloueff, 'Noms propres imprécatoires', *BIFAO* 40 (1941), 117–33, who entertained and subsequently rejected the notion that the *=w* referred to demons, favouring instead a religio-political sentiment against foreign invaders and occupiers. Amon, Mut, and Khonsu (among others) figure prominently in imprecatory names, and Guentch-Ogloueff noted (ibid. 126) that these deities were not ones to whom appeals were made against evil spirits. With the publication of the Oracular Amuletic Decrees, this claim is now known to be wrong.

Childbirth was, and remains, a medically dangerous moment. In P. Westcar the birth of the royal children is facilitated by four beneficent goddesses, Isis and Nephthys surrounding the mother, Hekat hastening the perilous act of birth, and Meskhenet pronouncing the fate of each child, in effect issuing a type of oracular decree. Curved apotropaic ivory wands carrying the images of protective deities, and the frightfully-formed Bes and Taweret—often brandishing knives—served to repulse the maleficent entities which could imperil the life of the mother or snatch away the newborn. Among the spells in P. Leiden I 348 (J.F. Borghouts, 'The Magical Texts of Papyrus Leiden I 348', *OMRO* 51 (1971), 28–31, pls. 13–15, 30–2 for Spells 28–34 (=rt. 13,9 - vs. 11,8); Borghouts, *Ancient Egyptian Magical Texts*, 39–40), P. Berlin 3027 (A. Erman, *Zaubersprüche für Mutter und Kind aus dem Papyrus 3207 des Berliner Museums, Berlin* (APAW, Ph.-H. Klasse; Berlin, 1901]; Borghouts, *Ancient Egyptian Magical Texts*, 41–3), and P. Ramesseum III and IV (J.W.B. Barns, *Five Ramesseum Papyri* (Oxford, 1956), 22–3, pls. 13–14 (B 20–34) and 24–9, pls. 16–20; Borghouts, *Ancient Egyptian Magical Texts*, 43–4) for hastening childbirth, lessening pain, insuring safe results, and causing the descent of the placenta are those specifying the demons against whom magical measures must be taken. The terrors include an evil influence attempting to have intercourse with the new mother or injuring her uterus, a *bꜥꜥ*-demon in the mother's milk which weakens the limbs and organs of her baby, and demons with head turned backwards whose 'kiss' hushes and takes away a baby, and who are repelled by a concoction which includes garlic! For a general discussion of childbirth and motherhood, now see G. Robins, *Women in Ancient Egypt* (London, 1993), 82–8.

[44]J. Černý, *Papyrus hiératiques de Deir el-Médineh*, I (Cairo, 1978), 12 n. (a), pl. 15 line 6.

[45]See too R.O. Faulkner, 'The Verb *'I* "To Say" and its Developments', *JEA* 21 (1935), 181.

loose garnets. Two Middle Kingdom cylinders were reported to have been found with papyri in them, but the claims were never borne out by later inspection.[46]

Hollow cylinder pendants are also known from Alalakh in Syria and Ziweye in Iran. A Meroïtic hollow gold cylinder was found *in situ* on a girl's neck. Pendants of Phoenician origin were found in Pharros on the island of Sardinia and seem to have contained inscribed plates of metal instead of papyrus. That Egyptian prototypes were the basis for foreign (mainly Phoenician) imitation and dissemination appears beyond doubt to at least one scholar.[47] Four examples of amulet cases from Carthage, Spain, Malta, and the western Mediterranean bear representations of Sekhmet, Bastet, Horus, and Amon-Re, and protect thin metal ribbons on which an approximation of Egyptian script was attempted by someone not acquainted with the Egyptian language.[48] One might object that the precise identity in contents cannot be demonstrated for these artefacts, and that such cylinders could be amuletic without sheltering oracular decrees. However, to be amuletic, talismans need not be as complex as deity-topped hollow amuletic cylinders encasing metal foil with mock Egyptian inscriptions, and the aping of attested archetypes would make them conscious imitations of Egyptian Oracular Amuletic Decrees, even though their wearers may not have understood the mechanisms by which the originals were conceived or possessed any comprehension of the inscription in the Egyptian exemplars. Thus, their amuletic nature is achieved by simulating Egyptian Oracular Amuletic Decrees, despite the possibility that the foreign amulets themselves may not have been generated by an oracle.

To explain the short span of time represented by the Oracular Amuletic Decrees, Edwards posited that they had become popular suddenly and went out of favour the same way, asking whether their failure was due to specific promises which experience showed to be false.[49] Edwards' conclusion of the ephemeral nature of the Oracular Amuletic Decree genre may yet be contradicted by wider material evidence not completely studied. It is not in the nature of religion for it to be discarded because experience shows specific promises to be false. Quite to the contrary, if the foreign amuletic cylinders can be shown

[46]Ogden, *JEA* 59, 231–3; J.J. and R.M. Janssen, 'A Cylindrical Amulet Case: Recent Investigations', in I. Gamer-Wallert and W. Helck (eds), *Gegengabe. Festschrift für Emma Brunner-Traut* (Tübingen, 1990), 161–4; P. Berlin 3027 P (vs. 2, 2–7) (Erman, *Zaubersprüche*, 38–40; Borghouts, *Ancient Egyptian Magical Texts*, 42f) preserves a spell to be said over pellets of gold, balls of garnet(?) (*ḥmȝg.t*), and an engraved seal, which are strung on a strip of fine linen and applied as an amulet to the throat of a child. Might the cylinder cases containing loose garnets or small amulets be an extension of this concept?

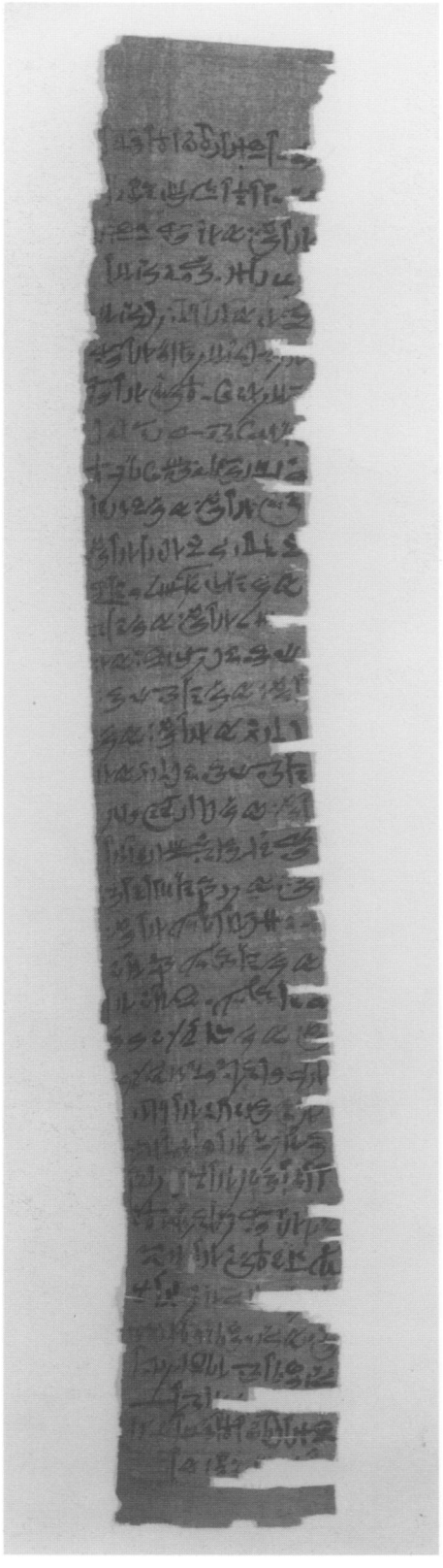
[47]Ogden, *JEA* 59, 231–3.

[48]J.M. Ogden, 'An Additional Note on "Cylindrical Amulet Cases"', *JEA* 60 (1974), 258–9.

[49]Edwards, *OAD*, xix. The sudden appearance and disappearance of the particular oracular cult of Horus-of-the-Camp (see K. Ryholt, 'A Pair of Oracle Petitions Addressed to Horus-of-the-Camp', *JEA* 79 (1993), 189–98) may be part of a unique phenomenon unrelated to oracles. The ephemeral nature of the god, his association with a military camp, and sole depiction in a relief commissioned by Herihor may in fact be related to Herihor's background. The priest and 'king' began his recorded career as a military commander most likely sent to quell disturbances in Thebes. Both he and Paiankh were generals, perhaps originally headquartered around El-Hibeh. Some of Herihor's sons bear Libyan names, and the camp at El-Hibeh might originally just have been a concentration of mercenaries of Libyan decent (cf. *The Temple of Khonsu*, I (OIP 100; Chicago, 1979), xiii–xiv). In any case, with the assumption of the high priesthood of Amon and residence by this official at El-Hibeh, the prominence of the original camp god could have been supplanted by Amon on orders from the top, not through any military conflict and destruction of the temple of Horus-of-the-Camp. See, however, the opinion expressed by Ryholt (ibid. 195–8).

to have descended from Egyptian prototypes published here and in Edwards' monograph, the Oracular Amuletic Decrees will have been yet another Egyptian religious practice to have been imitated, broadcast, and adopted by other cultures.[50]

[50]Nor did the practice die out in Egypt. *PGM* VII. 579–90 is a phylactery against 'daimons, against phantasms, against every sickness and suffering' which should be inscribed either on a leaf of gold, silver, or tin, or in hieratic on papyrus and then worn. From the same papyrus (P. Lond. 121) of the third or fourth century AD a general spell for dream revelation (*PGM* VII. 478–90) instructs that the *voces magicae* be written on a strip of tin and then worn around the neck. For both spells one presumes that the medium was rolled and placed within a container suspended by a cord. Some of the Fayum mummy portraits of pre-pubescent boys depict the youths wearing a cylindrical amulet on a cord around the neck, as noted in D. Montserrat, 'The Representation of Young Males in "Fayum Portraits"', *JEA* 79 (1993), 224, and Fischer-Elfert, *JEA* 82, 144 n. 55.



Papyrus Cleveland 14.723
(*Courtesy of the Cleveland Museum of Art*)

AN ORACULAR AMULETIC DECREE OF KHONSU IN THE CLEVELAND MUSEUM OF ART
(pp. 155–67)

EINE GRABÜBERNAHME IN DER 30. DYNASTIE

Von KARL JANSEN-WINKELN

Translation of the texts on the door-jambs Cambridge Fitzwilliam E.5.1909 and Brooklyn 56.152. They come from a tomb of the Saite Period reused in the Thirtieth Dynasty. The new user, a secretary of Nectanebo I, addresses the old owner, a palace official under Amasis, and claims to have done him a great favour by restoring and reusing his tomb. In his response, the old owner declares himself to have acted as a mediator and assures his 'benefactor', and the king who allowed the transfer, of the goodwill of the gods. Particularly remarkable is the presence of a type of personal 'guardian angels' (*špswt*) in the texts and decoration.

1909 fand W. M. F. Petrie in der Südwestecke des 'Palastes des Apries' einen rechteckigen Steinblock (126 × 34 × 14 cm) verbaut ('used in reconstruction along with brickwork'), der auf beiden Seiten dekoriert und beschriftet war. Auf der Außenseite steht ein nach rechts gewandter Mann im 'persischen Mantel',[1] in der rechten Hand einen langen Stock haltend, darüber eine aus vier Kolumnen bestehende Inschrift, beides in versenktem Relief. Auf der Innenseite sieht man, in erhabenem Relief und mit gut erhaltenen Farbresten, eine stehende Frau, die einen etwas kleiner dargestellten Mann säugt, darunter fünf kurze Kolumnen Beischrift, darüber die Reste von zwei Zeilen Hieroglyphen in größerem Maßstab.

Schon Petrie hatte gesehen, daß es sich um einen Türpfosten aus einem Grab handeln muß. Das Stück wurde 1909 dem Fitzwilliam Museum in Cambridge übergeben und ist dort unter der Nummer E.5.1909 registriert. Petrie hat den Block noch 1909 publiziert,[2] zuletzt wurde er in dem von E. Vassilika herausgegebenen Katalog abgebildet und beschrieben.[3]

Das fast genau entsprechende Gegenstück dazu (die Frau säugt hier den Mann nicht, sondern umarmt ihn), offensichtlich von der anderen, rechten Seite des Eingangs, befindet sich im Brooklyn Museum (Inventarnummer 56.152). Es ist 1960 von B. Bothmer veröffentlicht und zusammen mit dem Gegenstück aus Cambridge detailliert beschrieben worden.[4] Eine bessere Abbildung (mit kurzem Kommentar von R. S. Bianchi) findet sich in einem neueren Katalog des Brooklyn Museum.[5] Über den Fundort dieses Stückes scheint nichts bekannt zu sein.

Während Stil und künstlerische Bedeutung der Türpfosten von Bothmer eingehend erörtert worden sind, wurden die Inschriften bisher vernachlässigt. Ein Übersetzungsversuch von J. H. Walker bei Petrie[6] hilft heute nicht viel weiter, und eine bei Bothmer

[1] Vgl. dazu E. Staehelin in: *LÄ* VI, 732, s.v. 'Tracht' sowie die Angaben von A. Leahy, 'The Date of Louvre A.93', *GM* 70 (1984) 45 und R. S. Bianchi im Katalog *Cleopatra's Egypt* (New York 1988), 118 (Nr. 25); 128 (Nr. 33).

[2] *The Palace of Apries (Memphis II)* (BSAE und ERA 15, London 1909), 13; 20–1; pl. xvii; xxv.

[3] *Egyptian Art* (Cambridge 1995), 118–19. Zu einigen weiteren Hinweisen vgl. PM III², 831.

[4] *Egyptian Sculpture of the Late Period 700 B.C. to A.D. 100* (New York 1960), 92–4 (Nr. 74); pl. 70–1 (*ESLP*). Vgl. auch PM III², 874.

[5] R. A. Fazzini u.a., *Ancient Egyptian Art in the Brooklyn Museum* (New York 1989), Nr. 78.

[6] *Memphis* II, 21.

angekündigte Bearbeitung[7] ist m. W. nie erschienen. Nur J. Quaegebeur hat in seiner Monographie über den Gott Schai zwei kurze Ausschnitte aus beiden Texten übersetzt.[8] Das besondere Interesse dieser beiden Stücke liegt aber—neben ihrer künstlerischen Bedeutung—vor allem in den Inschriften, die im folgenden im Zusammenhang behandelt werden sollen.

Texte

1. Cambridge E.5.1909, Vorderseite (fig. 1; pls. XX, 1, XXI, 1)[9]

(1) 'Der Erbfürst und Graf, der königliche Siegler und einzigartige Freund, *jmj-jz*, königliche Herold, der persönliche Urkundenschreiber [des Königs][a] *Ṯȝj-ȝst-n-jm.w*,[b] indem er sagt: "Ich habe für dich gehandelt, Leiter der Vorhalle[c] des (2) Königs von Ober- und Unterägypten *Ḥnm-jb-Rˁ*, gerechtfertigt, *Jˁḥ-msjw-zȝ-Njtt*,[d] bezüglich dieses (Grabes),[e] das du deshalb(?) angelegt hast,[f] denn ich habe von deiner Ehrwürdigkeit[g] zu deiner Zeit gehört. Ich habe restauriert, was du gebaut hast, ich habe erneuert dein Werk als (3) dein Andenken(?) auf Erden,[h] indem ich deinen Namen dauern lasse als einen guten an deiner Stelle in der 'großen Halle'.[i] Ich habe diese Kapelle erbaut für deinen Schutzgeist (namens) *ˁnḫt*,[j] und ich habe meinen Schutzgeist (namens) *Smst* (4) ihr beigegeben, um mit dir vereint zu sein.

Mögest du (meine) guten Taten vor den großen Gott legen, mögest du Jahre erbitten für den König *Ḥpr-kȝ-Rˁ*, er lebe ewig, in dessen Zeit ich dir dies getan habe."'

2. Brooklyn 56.152, Vorderseite (fig. 2; pls. XX, 2, XXI, 2)[10]

Die Inschrift auf dem Türpfosten in Brooklyn enthält die Antwort des *Jˁḥ-msjw-zȝ-Njtt:*
(1) 'Der Erbfürst und Graf, königliche Siegler und einzigartige Freund, der Leiter der Vorhalle *Jˁḥ-msjw-zȝ-Njtt*, indem er sagt: "Ich habe für dich noch mehr getan als du getan hast, indem ich die Götter preise,[k] damit du (2) groß bist unter der Gnade des Königs, indem ich umhergehe in der Nekropole in deinem Namen[l] und deine guten Taten neben den großen Gott lege,[m] damit ich Tadel[n] von dir wende und Gutes bewirke für das Gute, das du gesagt hast, indem ich Millionen (3) von Jahren[o] gebe dem Sohn des Re und Herrn der Diademe *Nḫt-nb.f*, er lebe wie Re.

Ich will vereint sein mit dir nach deinem Alter, wie dein Schutzgeist (4) und mein Schutzgeist vereint sind. Es ist dein Herr und es ist[p] deine Jenseitsversorgtheit bei ihm, die es in dein Herz gelegt haben,[q] denn er kennt meine Jenseitsversorgtheit wegen dessen, was ich getan habe."'[r]

[7] Durch H. De Meulenaere und J. Yoyotte, s. *ESLP*, 93.

[8] *Le dieu égyptien Shaï* (OLA 2, Löwen 1975), 156.

[9] Nach Petrie, *Memphis* II, pl. xxv, nach dem Foto berichtigt. Ich danke Frau Dr. P. Wilson vom Fitzwilliam Museum Cambridge für die Kollation einiger fraglicher Zeichen (v.a. der 𓎛 und 𓎜-Hieroglyphen) und Frau Dr. E. Vassilika für die Genehmigung zur Publikation der Fotos.

[10] R. A. Fazzini, der Chairman des Department of Egyptian, Classical and Ancient Middle Eastern Art, sandte mir freundlicherweise zusätzliche Fotos der Inschrift und erlaubte ihre Veröffentlichung, und ich danke ihm und Dr. D. Spanel zudem für die Kollation einiger fraglicher Zeichen.

FIG. 1. Cambridge E.5.1909, Vorderseite.

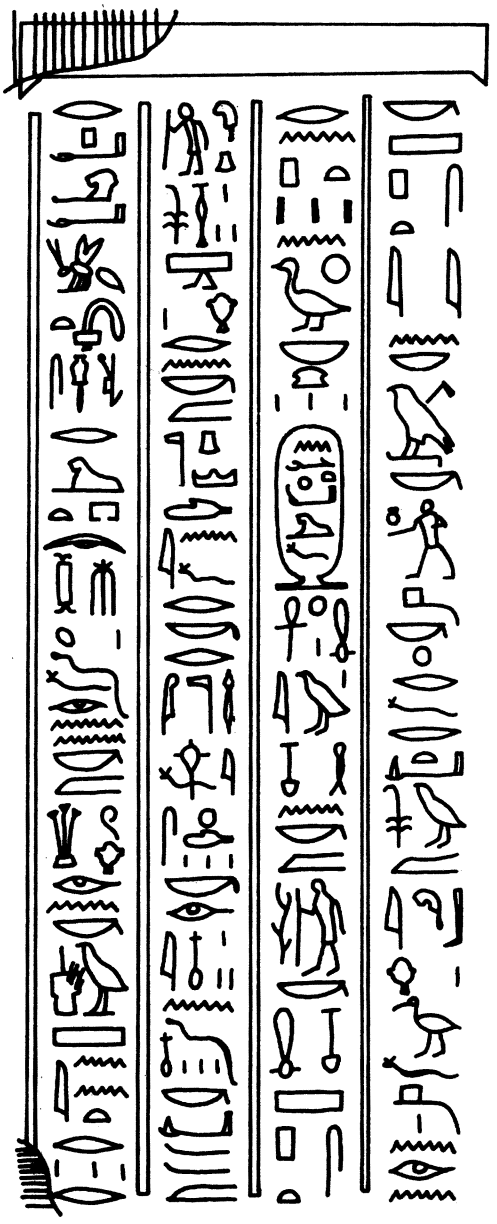


FIG. 2. Brooklyn 56.152, Vorderseite.

3. Brooklyn 56.152, Rückseite (fig. 3; pl. XXII, 1)

—zwei Zeilen oben:
(1) '[Der König von Ober- und Unterägyp]ten *[Ḥnm-jb-Rˁ]*, gerechtfertigt [...]
(2) den Leiter der Vorhalle *Ỉˁḥ-msjw-zꜣ-Njtt* wegen dieser Arbeit, wie (ich) es getan habe für [...]'
—darunter, in fünf Kolumnen:
Über dem Mann: (1) 'Der königliche Schreiber *Ṯꜣj-ꜣst-n-jm.w*'.

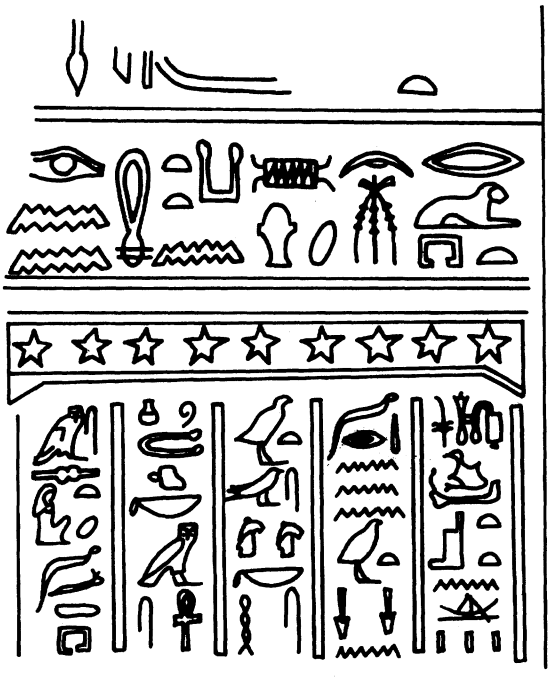


FIG. 3. Brooklyn 56.152, Rückseite.

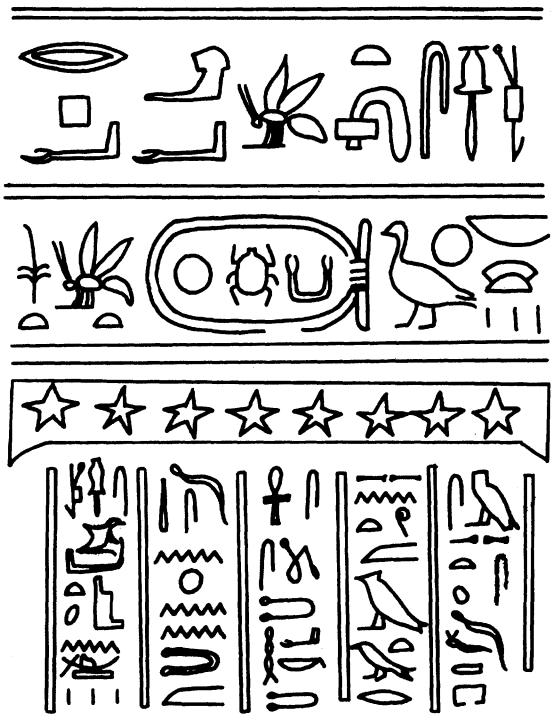


FIG. 4. Cambridge E.5.1909, Rückseite.

Rede der Frau: (2) 'Sprechen von Worten: "(Ich) habe dich aufgezogen, (ich) habe mich zu dir gesellt,[s] (3) indem (ich) deine Kraft vergrößere, (4) so daß deine Nase verjüngt wird[t] mit Leben und Gesundheit."'[u]
Über der Frau: (5) '*Smst*, die das Haus versorgt'.

4. Cambridge E.5.1909, Rückseite (fig. 4; pl. XXII, 2)

—zwei Zeilen oben:
(1) 'Der Erbfürst und Graf, der königliche Siegler, einzigartige Freund [...]
(2) der König von Ober- und Unterägypten *Ḥpr-kȝ-Rˁ*, der Sohn des Re, der Herr der Diademe [*Nḫt-nb.f*...]'
—darunter, in fünf Kolumnen:
Über dem Mann: (1) 'Der einzigartige Freund *Tȝj-ȝst-n-jm.w*'.
Rede der Frau: (2) 'Sprechen von Worten: "(Ich) habe dich gesäugt mit (3) Leben und Gesundheit,[v] damit dein Leib gestärkt wird,[w] (4) (ich) habe dich (neu) geschaffen als große Amme."'[x]
Über der säugenden Frau: (5) '*Smst*, die das Haus versorgt'.[y]

Anmerkungen

(a) Zu *zš ˁ [njswt] n {r} ḫft-ḥr* s. W. Ward, 'Old Kingdom *sš ˁ n nsw n ḫft-ḥr*, "Personal Scribe of Royal Records", and Middle Kingdom *sš ˁ n nsw n ḫft-ḥr*, "Scribe of the Royal Tablet of the

Court''', *Or* 51 (1982), 382–9. Grundsätzlich ist auch *n r-ḫft-ḥr* nicht auszuschließen, da ja *ḫft-ḥr* und *r-ḫft-ḥr* praktisch bedeutungsgleich sind, allerdings ist *r-ḫft-ḥr* sonst nicht substantivisch belegt. Der Zusatz *n-ḫft-ḥr* wird bedeuten, daß er nicht nur im königlichen Auftrag tätig war, sondern tatsächlich unmittelbar mit dem König zu tun hatte, also ihm 'gegenüber' treten durfte. Allerdings ist es natürlich fraglich, inwieweit derartige Titel in dieser Zeit noch ernstzunehmen sind.

(b) Zum Namen ('Isis ergreife sie') s. M. Guentch-Ogloueff, 'Noms propres imprécatoires', *BIFAO* 40 (1941), 122–3 und H. De Meulenaere 'Un notable Mendésien de la 26^{e} Dynastie' in: P. Posener-Kriéger (ed.), *Mélanges Gamal Eddin Mokhtar* (BdÉ 97, Kairo 1985), I, 193, n. 13 und 14.

(c) Zum Titel *jmj-rꜥ rwt* vgl. R. Buongarzone, 'La *rw(y)t* e il *mr rw(y)t*', *EVO* 18 (1995), 45–63 sowie K. Jansen-Winkeln, 'Zu den Denkmälern des Erziehers Psametiks II.', *MDAIK* 52 (1996), 132.

(d) Diese Person aus dem Ende der 26. bzw. dem Beginn der 27. Dynastie ist auch in zeitgenössischen Denkmälern bezeugt. Von ihr sind mindestens vier Statuen bekannt, ferner ein Sarkophag und eine Opfertafel, s. Bothmer, *ESLP*, 68.

(e) Offenbar eine altertümliche, den Inschriften des Alten Reiches entlehnte Formulierung: Dort wird in Grabinschriften das Grab selbst häufig einfach durch *nw* 'dieses' bezeichnet, s. *Wb* II, 216, 6, E. Edel, *Altäg. Gramm.*, § 197 und id., 'Untersuchungen zur Phraseologie der ägyptischen Inschriften des Alten Reiches', *MDAIK* 13 (1944), 3 (§ 6A); 50 (§ 46A). Die etwas umständliche Formulierung 'handeln für jdn. bezüglich...' erklärt sich daraus, daß er ja nicht sagen konnte, 'ich habe dir dieses (Grab) gemacht' (s.u.).

(f) Das *n* hinter *jrj.n.k* ist eine Crux dieser Inschrift. Will man den Text nicht emendieren, kann es nur als Präpositionaladverb *n(j)* 'deshalb, dadurch' (Edel, *Altäg. Gramm.*, § 751, a) oder als *n(.j)* 'für mich' verstanden werden. Im ersten Fall bezöge sich 'deshalb' auf den Titel des *Jḫ-msjw-zꜣ-Njtt*: Er hat das Grab anlegen können, weil er eine so hohe Stellung hatte. Eine Lesung *jrj.n.k n(.j)* 'das du für (mich) angelegt hast' ist dagegen inhaltlich kaum akzeptabel (auch wenn es sich ja um eine Art Grabusurpation handelt, s.u.). Da auch die erste Möglichkeit nicht sehr überzeugend ist, wäre zu erwägen, ob der Text nicht fehlerhaft sein könnte, z.B. *jrj.n.k n⟨.k⟩* 'das du für ⟨dich⟩ angelegt hast' oder, was nur eine Zeichenumstellung erfordert, *{n} ḥr sḏm.⟨n.⟩j* (Vorschlag J. Osing).

(g) Bzw. 'Jenseitsversorgtheit'. Gemeint ist wohl, daß *Jḫ-msjw-zꜣ-Njtt* sowohl 'in Ehren' gestorben ist als auch, daß es sein rechtmäßiges Grab ist, das ihm aufgrund seines *jmꜣḫ*-Status zukam. Die Lesung des Zeichens unter  ist nicht ganz sicher. Nach einer Kollation durch Frau Dr. P. Wilson wäre sowohl  als auch  möglich, aber nur das letztere kommt dem Zusammenhang nach in Frage.

(h) Unsicher, vielleicht *gn(w)t.k (tp tꜣ)* zu verstehen, vgl. *Wb* V, 173, 5. Die Schreibung mit *k* statt *g* wäre in dieser Zeit kein Hindernis und 'alphabetische' Schreibungen ohne Determinativ kommen in diesen beiden Texten ja auch sonst vor (z.B. *rnpwt*, *jb*, *špst*). Eine andere Möglichkeit wäre es, das in zu emendieren. Dann könnte  eine Schreibung von *nw.k* 'das Deinige' sein (vgl. *Wb* II, 216, 18–19) und der Ausdruck *m nb nw.k* soviel wie 'als dein Erbe' bedeuten (weil ihm das Grab des *Jḫ-msjw-zꜣ-Njtt* zur Nutzung und zugleich zur Restaurierung zugewiesen worden war, s.u.).

(i) Damit ist hier vermutlich die Kultkammer gemeint. Zu *ḫꜣ-wr* im Sinne von 'Heiligtum' s. die Verweise bei D. Meeks, *ALex* II, Nr. 78.2920. *st.k m ḫꜣ-wr* könnte dann der für den alten Besitzer *Jḫ-msjw-zꜣ-Njtt* reservierte Teil der Kultkammer sein.

(j) Zu den *špswt*, mit dem Geburtsdatum verbundenen persönlichen Schutzgottheiten s.u.

(k) ist auf den ersten Blick rätselhaft. Am ehesten könnte es sich um eine Schreibung von *swꜣš* handeln, also *swꜣš.j n nṯrw* (vgl. *Wb* IV, 63, 26), so auch H. De Meulenaere, 'Une statue de prêtre héliopolitain', *BIFAO* 61 (1962), 41. Aufgrund des stark veränderten Lautbestandes (vgl. koptisch ⲱⲟⲩⲱⲟⲩ) sind bei diesem Wort unkonventionelle Schreibungen nicht sehr überraschend.

(l) Dieser Satz beschreibt recht plastisch die Funktion als 'Mittler' (s. H. te Velde, *LÄ* IV, 161–3) zwischen Gott und Mensch, die *Jḥ-msjw-zꜣ-Njtt* auf Wunsch des *Ṯꜣj-ꜣst-n-jm.w* übernimmt (s.u.).

(m) Der letzte Satz ist die direkte Entgegnung auf die Bitte des *Ṯꜣj-ꜣst-n-jm.w: dj.k nfrw(.j) ḥr nṯr ꜥꜣ* in Z.4 des Blockes in Cambridge. Die Phrase *r-gs nṯr ꜥꜣ* ist in „Anrufen an die Lebenden" in der Spätzeit nicht selten, vgl. z.B. A. Kamal, *Stèles ptolémaïques et romaines* (CG, Kairo 1905), 64 (Z.15); D. Wildung, *Imhotep und Amenhotep* (MÄS 36, München–Berlin 1977), Taf. VII (Z.3); E. Iversen, *Two Inscriptions Concerning Private Donations to Temples* (Kopenhagen 1941), 19 (Z.7); E. A. W. Budge, *Some Account of the Collection of Egyptian Antiquities in the Possession of Lady Meux* (London 1896), 132 (Z.14); E. Rogge, *Statuen der Spätzeit* (CAA Wien, Lief. 9, Mainz 1992), 44 u.a.m.

(n) *ḫsf.j sḫd.k.* Zu *sḫd* vgl. *Wb* IV, 267, 1 und H. Jacquet-Gordon, 'The Inscriptions on the Philadelphia–Cairo Statue of Osorkon II', *JEA* 46 (1960), 16, Z.3 und 5.

(o) Die Schreibung  für *ḥḥ* 'Million' ist schon von H. De Meulenaere ('Zwei Bemerkungen zur Naukratisstele', *ZÄS* 84 (1959), 78, n. 4; vgl. auch id., *BIFAO* 61, 41) registriert worden. Die Passage *dj.j ḥḥ m rnpwt...* ist die Antwort auf die Bitte *nhj.k rnpwt n njswt-bjt Ḥpr-kꜣ-Rꜥ...* in Z.4 des Cambridge-Textes.

(p) Bei dem runden Gegenstand, den der schreitende bzw. laufende Mann in der Rechten hält, handelt es sich nach einer Kollation durch R. A. Fazzini und D. Spanel am ehesten um ein Gefäß (also wohl den *nw*-Topf). Auf jeden Fall ist die Hieroglyphe in diesem Zusammenhang *jn* zu lesen, von der Schreibung für *jnj* (vgl. *Wb* I, 90) abgeleitet.

(q) Mit 'es' (*sw*) ist natürlich die Tat des *Ṯꜣj-ꜣst-n-jm.w* gemeint, der Neubau oder Umbau des Grabes. Eine ähnliche Phrase findet sich z.B. auf der Statue Kairo CG 42226 (s. meine *Ägyptischen Biographien der 22. und 23. Dynastie* (ÄUAT 8, Wiesbaden 1985), 511 k)): *jn nṯr dj s m jb.j* 'es war Gott, der es in mein Herz gelegt hat', wo sich 'es' auf den zuvor berichteten Neubau einer Kapelle bezieht.

(r) Mit 'dein Herr' kann nur der König, also Nektanebos I., bezeichnet sein. Das Suffix von *rḫ.f* könnte sich auch auf den König, aber ebensogut auf *jb.k* beziehen. Auf jeden Fall besagen die letzten beiden Sätze, daß *Ṯꜣj-ꜣst-n-jm.w* 'vom König versorgt' (*jmꜣḫw ḥr njswt*) war und aufgrund dieses Status mit Genehmigung des Königs das Grab des *Jḥ-msjw-zꜣ-Njtt* übernahm, nachdem er es für sich und den alten Inhaber gemeinsam neu hergerichtet hatte.

(s) *rnn.n(.j) ṯw snsn.n(.j) ṯw.*

(t) *sḫwn.tw fnḏ/šrt.k.* Statt *sḫwn.tw* könnte man auch *sḫwn.j* lesen, mit  als Suffix 1. Sg. 'fem.', s. D. Kurth in: id., *Die Inschriften des Tempels von Edfu*, Begleithefte, 1 (Wiesbaden 1990), 66–70; vgl. auch K. Piehl, 'Le pronom suffixe féminin de la première personne du singulier', *Sphinx* 2 (1898), 75–8.

(u) Das  ist das große Problem dieser Inschrift und ihres Gegenstücks. An dieser Stelle könnte man versucht sein, *šrt.k* 'deine Nase' zu lesen und das *.s* dann auf *šrt* zu beziehen, aber das ist auf dem Türpfosten in Cambridge nicht möglich. Es dürfte am wahrscheinlichsten sein, nach einem Vorschlag von Frau Dr. L. M. Leahy, der ich dafür herzlich danke, *ꜥnḫ s(nb)* zu lesen. 'Leben und Gesundheit' ist als Gabe der Götter in königlichen Opferszenen (u.ä.) nicht selten, und die hier besprochene Szene ist ja deutlich dem königlichen Repertoire entlehnt. Die Kurzschreibung  wäre allerdings auch in der formelhaften Verbindung *ꜥnḫ snb* ungewöhnlich.

(v) Zu *snḫn* s. *Wb* IV, 169, 11-4. Z.T. bedeutet es—wie zu erwarten—klar 'verjüngen', z.T. aber wird es auch in Reden säugender Göttinnen gebraucht, und beim Säugen ist 'verjüngen' eigentlich unpassend (das Wörterbuch übersetzt in diesen Fällen mit 'aufziehen' und 'gedeihen lassen'). Grundbedeutung ist wohl einfach 'zum Kind machen', beim Säugen also etwa 'wie ein Kind behandeln' = 'säugen'. Zu *ꜥnḫ s(nb)* s.o., Anm. u.

(w) Auch hier wäre als Alternative zu *srwḏ.tw* wieder *srwḏ.j* möglich, mit = *.j* (fem.), s.o., Anm. t.

(x) Ich lese *ṯ(ꜣ)z.n(.j) ṯw m ꜣṯ jt wrt*, s. *Wb* V, 397, 15ff.; 398, 1–2.

(y) *sdf3 pr* statt *df3 pr*, wie das Gegenstück in Brooklyn hat; dafür wird hier *Smst* ohne Personendeterminativ geschrieben. Ob das eine bewußte Variante oder nur ein Versehen ist, läßt sich kaum entscheiden.

Kommentar

In den Anmerkungen zur Übersetzung ist mehrfach vorausgesetzt worden, daß die beiden Türpfosten aus einem Grab stammen. Dasselbe nehmen Bianchi[11] und Vassilika[12] an, während Bothmer nur von einer Kapelle ('chapel') spricht.[13] Da nicht bekannt ist, woher und aus welchem architektonischen Kontext beide Stücke (ursprünglich) stammen, ist man auf die Interpretation der Inschriften angewiesen, wenn man den Charakter dieser 'Kapelle' näher bestimmen will. So unsicher auch vieles im Verständnis dieser Texte sein mag, meines Erachtens deutet alles darauf hin, daß in ihnen von der Restauration bzw. der Übernahme eines *Grabes* die Rede ist:

— *T3j-3st-n-jm.w* spricht davon (fig. 1, Z.1–2), daß er etwas an 'diesem' (*nw*) getan habe, und *nw* kann in diesem Zusammenhang nur die Kapelle bzw. das Gesamtbauwerk bezeichnen. Zwar ist *nw* an sich ein unspezifischer Ausdruck, ein Pronomen, aber besonders häufig und charakteristisch ist die Phrase *jrj (r) nw* im Alten Reich, wenn von der Errichtung des Grabes die Rede ist, und solch eine besonders altertümliche Formulierung wäre ja in dieser Zeit durchaus zu erwarten.

— Daß mit *nw* das Grab gemeint ist, wird noch wahrscheinlicher dadurch, daß unmittelbar danach *T3j-3st-n-jm.w* seine Tätigkeit damit begründet, er habe von dem *jm3ḫ*-Status des *Jʿḥ-msjw-z3-Njtt* gehört, und dieser selbst wiederum spricht in seiner Antwort von dem *jm3ḫ*-Status seine 'Wohltäters' wie auch von seinem eigenen (fig. 2, Z.4). Auch dies ist natürlich kein unzweideutiges Indiz, da *jm3ḫ* sich nicht ausschließlich auf die 'Versorgung' mit Grab und Grabausstattung beziehen muß, aber es ist doch in dieser Bedeutung ganz besonders häufig.

— *Jʿḥ-msjw-z3-Njtt* berichtet, daß er in der Nekropole (umher)gehe (*šm.j ḥr rn.k m ḥrt-nṯr*), um die guten Taten seines 'Partners' dem Osiris vorzulegen und Schaden von ihm abzuwenden (fig. 2, Z.2). Diese Ortsangabe sowie die Tatsache, daß die Tat dem Osiris gemeldet wird,[14] spricht gleichfalls dafür, daß sie mit einem Bauwerk der Nekropole zu tun hatte.

— Der deutlichste Hinweis schließlich ist der Wunsch des *Jʿḥ-msjw-z3-Njtt*, mit seinem Partner nach dessen Tod vereint zu sein, ebenso wie ihre jeweiligen Schutzgöttinnen vereint seien (fig. 2, Z.3–4: *jw.j ⟨r⟩ zm3 ḥnʿ.k m-ḫt j3w.k mj zm3 špst.k špst.j*). Dieses Vereintsein 'nach deinem Alter' kann doch nur bedeuten, daß sie in ein und demselben Grab bestattet werden sollen.

— Würde es sich bei dem Bauwerk, aus dem die beiden Türpfosten stammen, dagegen um ein nichtfuneräres Heiligtum handeln, eine Votivkapelle o.ä., sollte man annehmen, daß es an eine größere Institution des Götter- oder Königskults angeschlossen war, aber darauf geben die Texte keinerlei Hinweis. Auch die Anwesenheit der persönlichen

[11] Im Katalog des Brooklyn Museum, s.o., Fußnote 5.
[12] Im Katalog des Fitzwilliam Museum, s.o., Fußnote 3 ('reused from the owner's tomb').
[13] *ESLP*, 92.
[14] Ein 'Mittler' mußte sich (als Toter) keineswegs notwendig an Osiris wenden, wie die 'Mittlerstatuen' zeigen (vgl. etwa *Urk* IV, 1833, 11ff.).

Schutzgottheiten, deren Wahl offenbar mit dem jeweiligen Geburtsdatum zusammenhängt (s.u.), ist in einem Grab eher verständlich als in einer Votivkapelle.

Was es mit dem Restaurationsarbeiten des *Ṯȝj-ȝst-n-jm.w* im einzelnen auf sich hatte, läßt sich natürlich nicht sagen. Denkbar wäre, daß der gesamte Oberbau erst von ihm errichtet wurde; zumindest aber ist der Eingangsbereich des Grabes komplett erneuert worden, da die Türpfosten beide eindeutig aus der 30. Dynastie stammen und nicht etwa überarbeitete Stücke der 26. Dynastie sind. Die beiden für ein Privatdenkmal sehr ungewöhnlichen Szenen auf den Innenseiten gehören ersichtlich zum religiösen Dekorationsprogramm der Kapelle, während die Inschriften der Außenseiten eine Aussage über ihre Entstehung machen, und zwar in Form eines Dialogs zwischen den beiden 'Besitzern'. *Ṯȝj-ȝst-n-jm.w* sagt in seiner Anrede: Er habe das Grab des *Ꜣḫ-msjw-zȝ-Njtt* restauriert und lasse dessen Namen darin dauern; er lasse die beiderseitigen Schutzgeister (*špswt*, s.u.) in diesem Grab vereint sein; er habe dies getan, weil er von dem guten Ruf gehört habe, den *Ꜣḫ-msjw-zȝ-Njtt* seinerzeit hatte. Diese 'Wohltat' bittet er ihn dem 'großen Gott' zu berichten; gleichzeitig soll er Jahre für den regierenden König Nektanebos I. erbitten. Der verstorbene *Ꜣḫ-msjw-zȝ-Njtt* antwortet, er habe alles getan, worum er gebeten worden sein und sogar noch mehr: Er habe bei den Göttern ein gutes Wort für den *Ṯȝj-ȝst-n-jm.w* eingelegt; er habe dessen Wohltat dem großen Gott berichtet; er habe dem König Nektanebos I. Millionen Jahre zukommen lassen. Er wünscht seinerseits, mit *Ṯȝj-ȝst-n-jm.w* nach dessen Tod ('nach deinem Alter') vereint zu sein. Die Tat des *Ṯȝj-ȝst-n-jm.w* sei durch den König veranlaßt worden und durch dessen 'Jenseitsversorgtheit' beim König.

Man wird sich den Vorgang vielleicht folgendermaßen vorstellen dürfen: Ein hoher Beamter Nektanebos I. möchte in der memphitischen Nekropole ein Grab haben und hat als *'jmȝḫw ḫr njswt'* möglicherweise Anspruch auf eine gewisse staatliche Hilfe dabei. Er sucht sich ein altes Grab der 26. Dynastie aus und erlangt die Genehmigung des Königs, es zu nutzen, ohne allerdings den alten Besitzer völlig zu verdrängen. Es ist keine einfache Usurpation eines Grabes, sondern beide belegen gemeinsam das nunmehr restaurierte Grab. Dieses Geschäft bringt offenbar allen Seiten Vorteile: Der alte Besitzer hat ein neu hergerichtetes Grab, der neue braucht kein eigenes zu bauen, sondern nur zu restaurieren, und auch der König wird als (angeblicher) Urheber bzw. Förderer des Handels der Gunst der Götter zuteil.

Fraglich ist allerdings, ob das Grab nur restauriert wurde oder nicht auch erweitert. Man könnte den Satz 'ich habe diese Kapelle erbaut...' in Z.3 des Blockes in Cambridge so verstehen, da zuvor schon von einer Restauration die Rede war. Ob dieser Satz bedeutet, daß die beiden *špst*-'Göttinnen' einen eigenen Kultraum bekommen haben, vielleicht einen neuen Oberbau? Es ist sicher kein Zufall, daß sich *Ṯȝj-ȝst-n-jm.w* ein Grab der 26. Dynastie ausgesucht hat, denn es ist ja bekannt, wie eng sich die 30. Dynastie gerade an Vorbildern der 26. Dynastie orientierte.[15] Deshalb muß aber der alte Grabbesitzer noch nicht 'vergöttlicht' gewesen sein, wie J. Quaegebeur anzunehmen scheint:[16] Die Tatsache, daß *Ꜣḫ-msjw-zȝ-Njtt* als 'Mittler' fungiert, erklärt sich einfach daraus, daß der neue Grabnutzer sein Vorgehen als etwas für den alten Besitzer

[15] Vgl. dazu u.a. Bothmer, *ESLP*, p. xxxvii; P. Munro, *Die spätägyptischen Totenstelen* (ÄgFo 25, Glückstadt 1973), 121; C. Vandersleyen (ed.), *Das Alte Ägypten* (Propyläen Kunstgeschichte, Bd. 15, Berlin 1975), 261–2.

[16] 'Les "saints" égyptiens préchrétiens', *OLP* 8 (1977), 136–7.

Vorteilhaftes darstellen will, und dieser kann seine 'Dankbarkeit' eben nur durch seine Dienste als Mittler erweisen.[17] Zugleich wird der König auf diese Weise, als einer der Nutznießer der Fürbitten des Mittlers, vorteilhaft in die Sache einbezogen.

Die merkwürdigen *špst*-Gottheiten, von denen im Text die Rede ist und die auf der Rückseite dargestellt sind, erfordern eine Erklärung. Aus den hier besprochenen Stücken geht zum einen hervor, daß es sich um göttliche Wesen handelt: Säugen und Umarmung, wie hier dargestellt, findet sich sonst grundsätzlich nur bei Göttinnen mit königlichen Personen. Zum anderen sind sie Individuen zugeordnet (*špst.j*, *špst.k*) und selbst durch einen Eigennamen individualisiert. Aus den ansonsten recht spärlichen Nachrichten über die *špst*-Schutzgötter geht hervor,[17] daß sie öfter parallel zu Schicksalsgottheiten wie Schai und Renenutet erwähnt werden. F. Ll. Griffith sah in *T špš.t* sogar 'the consort or the female parallel to the male *šy*'.[18] In einem Oracular Amuletic Decree der 22. Dynastie heißt es 'we shall propitiate his Noble Lady for him; we shall propitiate the Four Noble Ladies residing in Memphis for him' (*jw⟨.n⟩ (r) shr n.f tȝj.f špst jw.n (r) shr n.f tȝ jfdt špsyt ⟨ḥr-⟩jb Ḥwt-kȝ-Ptḥ*). 'We shall cause his fate, his destiny, his span (of life)...to be satisfactory for him.'[19] Wie Edwards zurecht vermutet, sollten die *špswt* diesem Kontext zufolge mit dem Geburtstag zu tun haben (oder allgemeiner mit dem Geburtsdatum). Edwards verweist auf eine Szene aus Deir el-Bahari,[20] wo eine knieende und vier stehende göttliche(?) Wesen (wie im Orakeldekret also 1 + 4) bei der Geburt anwesend sind. Die Vermutung, die *špswt* könnten mit dem Geburtsdatum zu tun haben, wird durch die hier besprochenen Blöcke erhärtet: *Smst* und *ꜥnḫt* sind die Namen von zwei Nilpferdgöttinnen, die in nichtastronomischen Kontexten in der Spätzeit dem elften und zwölften Monat zugeordnet sind.[21] Man wird daher vermuten dürfen, daß die *špst* namens *ꜥnḫt* die 'persönliche Schutzgöttin' des *Ꜣḫ-msjw-zȝ-Njtt* war, weil er im elften Monat geboren worden war, die *špst* namens *Smst* die des *Tȝj-ȝst-n-jm.w*, weil sein Geburtstag in den zwölften Monat fiel. Die Rolle der *špswt* als persönliche Schutzgöttinnen hat auch J. Quaegebeur hervorgehoben ('le génie personnel protecteur Shepset, comparable à la fée-marraine ou à l'ange gardien'), der dafür zurecht auch Personennamen wie *Tȝj.s-špst-hr.tj* ('ihre *špst* ist zufrieden') anführt.[22] Ob und woher so lange Zeit nach dem Tod des *Ꜣḫ-msjw-zȝ-Njtt* noch bekannt war, welche 'Monatsgöttin' ihm zuzuordnen war, ist schwer zu sagen. Es ist nicht recht wahrscheinlich (wenn auch durchaus möglich), daß man in der 30. Dynastie sein Geburtsdatum noch kannte. Denkbar wäre eher, daß er in der ursprünglichen Dekoration des Bauwerks schon seine

[17] Man vergleiche dazu auch Inschrift 65 aus dem Grab des Petosiris (G. Lefebvre, *Le tombeau de Petosiris* (Kairo 1923), I, 169–71; II, 40–1), wo es einen ganz vergleichbaren Dialog zwischen dem Graberbauer Petosiris und sinem verstorbenen älteren Bruder, der im selben Grab bestattet ist, gibt. Petosiris redet ihn an und teilt ihm mit, daß er ein(e) Grab(hälfte) für ihn erbaut hat, der verstorbene Bruder dankt ihm dafür und erklärt sich bereit, im Totengericht als Mittler für ihn zu wirken.

[18] Vgl. Quaegebeur, *Shaï*, 155–60.

[19] *Catalogue of the Demotic Graffiti of the Dodecaschoenus* (Les temples immergés de la Nubie, Oxford 1937).

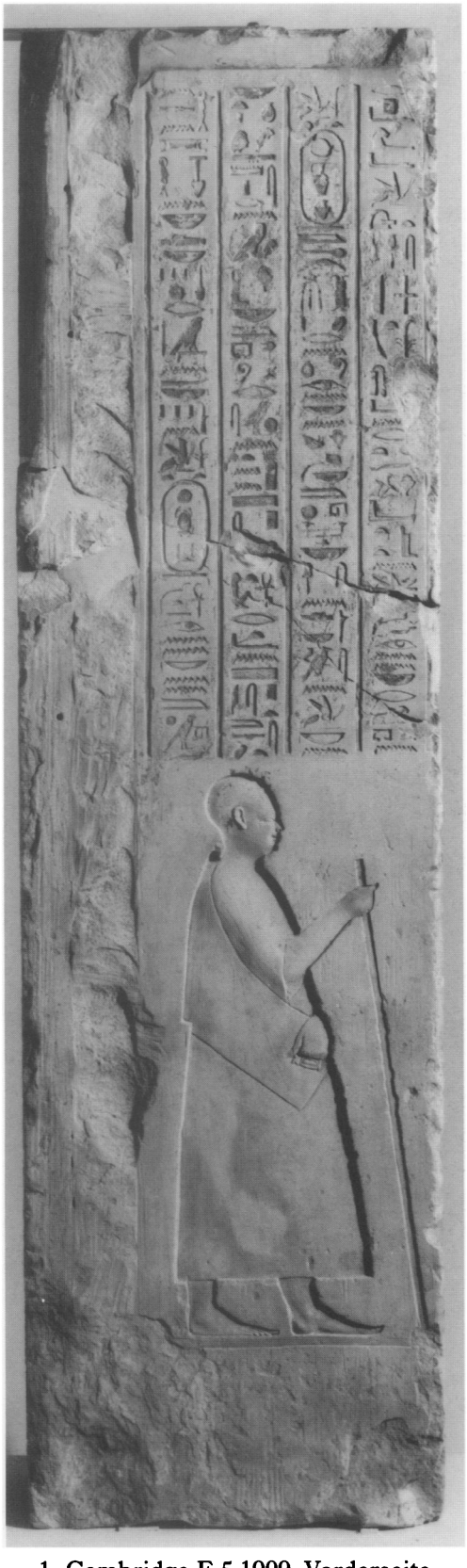
[20] I. E. S. Edwards, *Oracular Amuletic Decrees of the Late New Kingdom* (HPBM fourth series, London 1960), 96–7.

[21] A. Blackman, 'Some Remarks on an Emblem upon the Head of an Ancient Egyptian Birth-Goddess', *JEA* 3 (1916), 201–2; pl. xxxvii; vgl. H. Brunner, *Die Geburt des Gottkönigs* (ÄA 10, Wiesbaden 1964), 90ff.

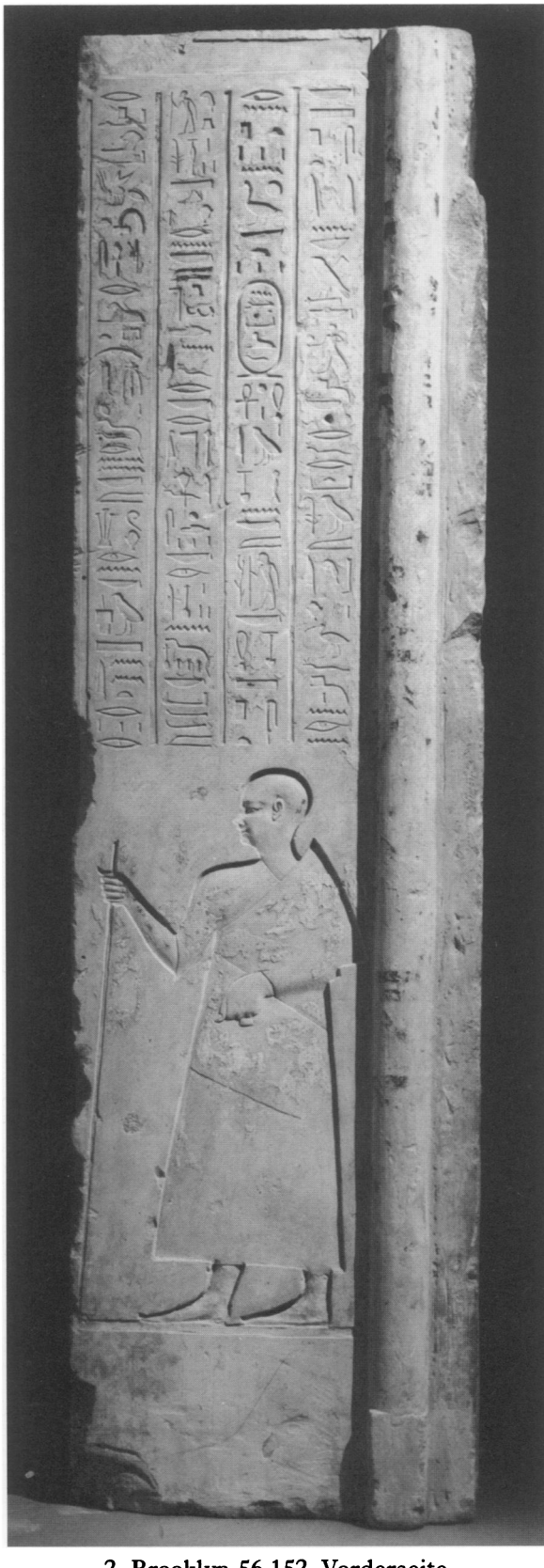
[22] S. G. Daressy, 'Thouéris et Meskhenit', *RecTrav* 34 (1912), 189–93; H. Dë Meulenaere, 'Anthroponymes égyptiens de Basse Epoque', *CdE* 38 (1963), 217–19; J. Osing in: *LÄ* IV, 191, s.v. 'Monat, Monatsgötter'.

[23] *Shaï*, 156–7. Dort weist er auch darauf hin, daß die 'Monatsgöttin' *Smst* manchmal ein Beiwort *sḏfȝ nḫn* führt, während sie in den Beischriften auf diesen Türpfosten durch das Epitheton *dfȝ pr* (fig. 3) bzw. *sḏfȝ pr* (fig. 4) näher qualifiziert wird.

špst-Schutzgöttin erwähnt hatte. Trifft beides nicht zu, müßte man annehmen, daß *Tȝj-ȝst-n-jm.w* willkürlich diejenige *špst* gewählt hat, die seiner eigenen zeitlich benachbart war.



1. Cambridge E.5.1909, Vorderseite
(*Courtesy of the Fitzwilliam Museum, Cambridge*)

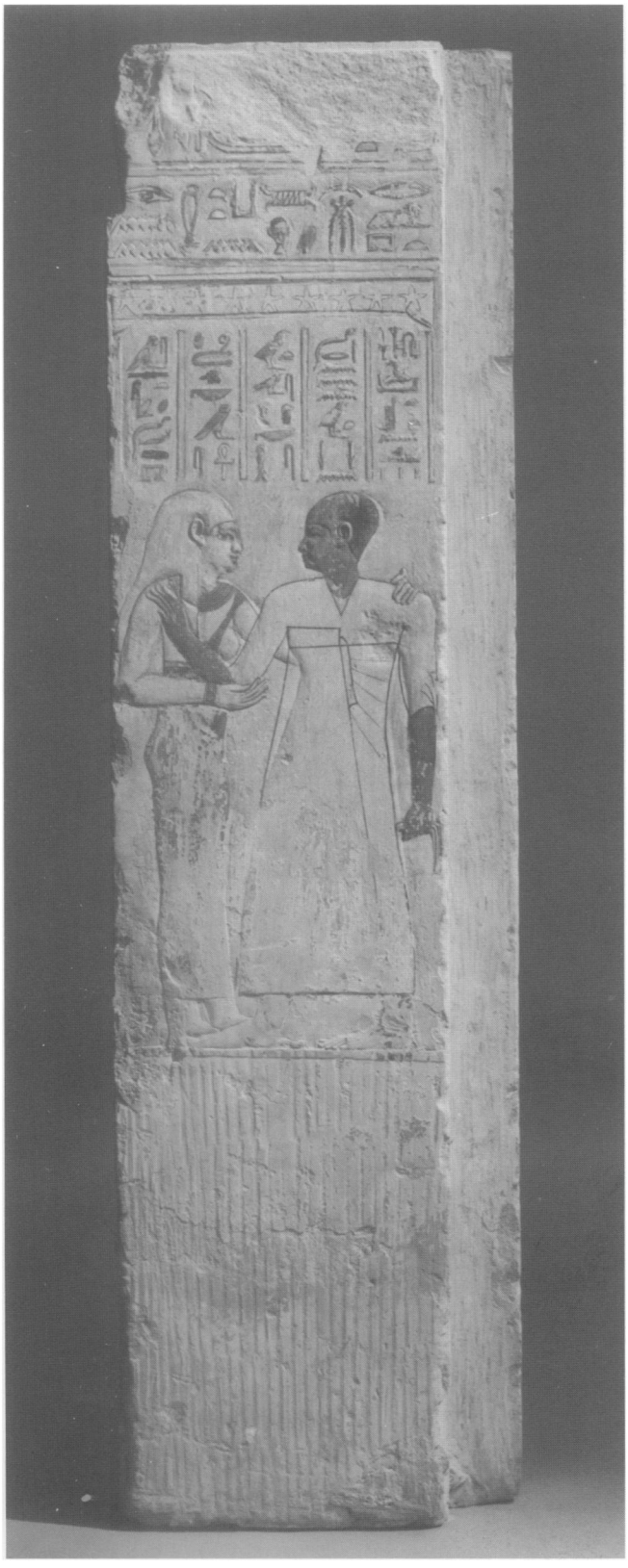


2. Brooklyn 56.152, Vorderseite
(*Courtesy of the Brooklyn Museum*)

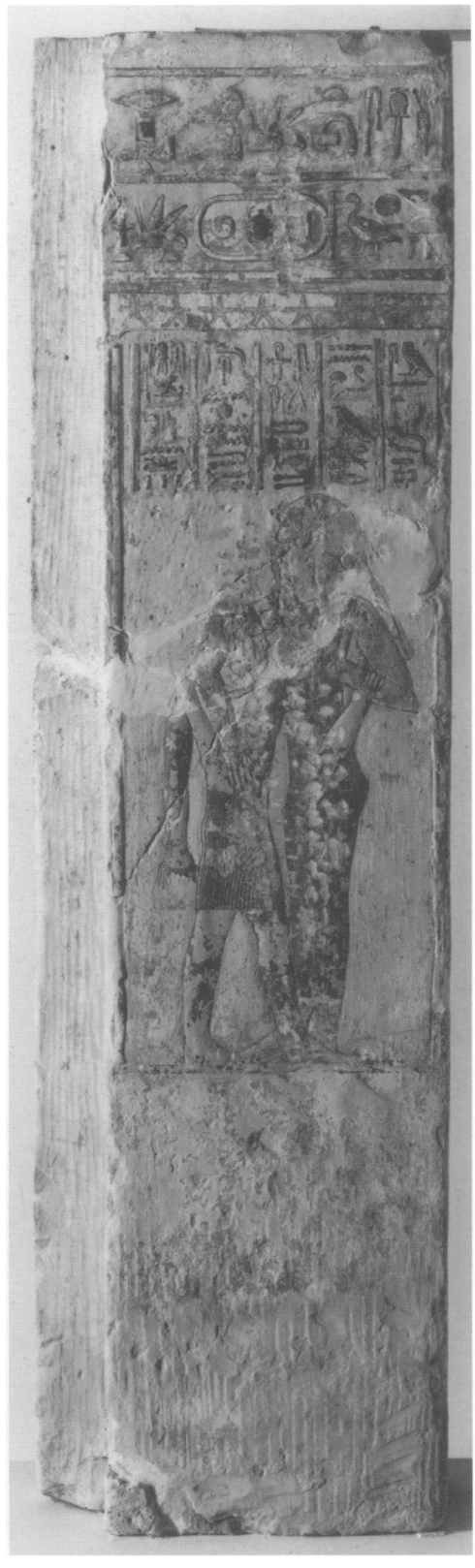
1. Cambridge E.5.1909, Vorderseite
(*Courtesy of the Fitzwilliam Museum, Cambridge*)

2. Brooklyn 56.152, Vorderseite
(*Courtesy of the Brooklyn Museum*)

EINE GRABÜBERNAHME IN DER 30. DYNASTIE (pp. 169–78)



1. Brooklyn 56.152, Rückseite
(*Courtesy of the Brooklyn Museum*)



2. Cambridge E.5.1909, Rückseite
(*Courtesy of the Fitzwilliam Museum, Cambridge*)

MORTUARY ARCHAEOLOGY AND RELIGIOUS LANDSCAPE AT GRAECO-ROMAN DEIR EL-MEDINA

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Post-excavation analyses and interpretations of the site of Deir el-Medina have focused on the extensive New Kingdom documentary and material data. This has usually been at the expense of later periods, although the site demonstrates a broad temporal spectrum, with the construction of a Ptolemaic temple and significant Saite, Ptolemaic and Roman mortuary activity. From the perspective of contextual archaeology, this article will examine some patterns of mortuary and religious usage in the Ptolemaic and Roman Periods. This is based on three case studies: the general pattern of burials; a late Roman family burial in the cellar of a Ramesside house; and the Hathor temple. These illustrate how the status of the site shifted from the Ptolemaic to the early Christian Period, and how successive monumental constructions acted as vehicles for conceptualising different ideologies.

IT is perhaps a paradox that the site of Deir el-Medina (fig. 1) is best known by a name—'Town Monastery'—which refers to the period of its long usage and reusage that has received the least attention. The extensive New Kingdom remains, both archaeological and documentary, have captivated Egyptologists since the rediscovery of the site in the eighteenth century. This is unsurprising given the intrinsic richness of the data and its seductive connection with the royal tombs in the Valley of the Kings. New Kingdom Deir el-Medina has remained the focus of popular and scholarly studies, with the result that the Ramesside town-site has been embodied and repopulated in a unique way. Such studies tend to represent the site as being abandoned and neglected after the Twenty-first Dynasty.[1] However, from the Third Intermediate Period onwards, the archaeological data demonstrate that Deir el-Medina continued to be used quite extensively for religious and mortuary purposes. This paper aims to extend the life of the site by concentrating on the Graeco-Roman presence at Deir el-Medina when, as we shall argue, the site took on new meanings as the temple was constructed under Ptolemy IV and his successors, and intrusive burials reemployed the Ramesside structures. Our temporal parameters are *c.* 217 BC to *c.* AD 300, covering the period of initial Ptolemaic reinvestment in the site

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[1] See, for example, R. David, *The Pyramid Builders of Ancient Egypt: A Modern Investigation of Pharaoh's Workforce* (London, 1986), 62–4.

until the last pre-Christian burials, although the religious significance of Deir el-Medina continued at least as late as the eighth century AD.[2]

Bernard Bruyère's multi-volume magnum opus, *Rapport sur les fouilles de Deir el Médineh*, records his excavations at Deir el-Medina in their totality, incorporating the Graeco-Roman finds as he encountered them. He never intended to make a chronologically coherent study of the site, and the Graeco-Roman material lies scattered throughout his reports. To date, there has been only one major synthesis to isolate the specific character of the Theban region in Graeco-Roman times—André Bataille's *Les Memnonia: recherches de papyrologie et d'épigraphie grecques sur la nécropole de la Thèbes d'Égypte aux époques hellénistique et romaine* (Cairo, 1952). This says very little about

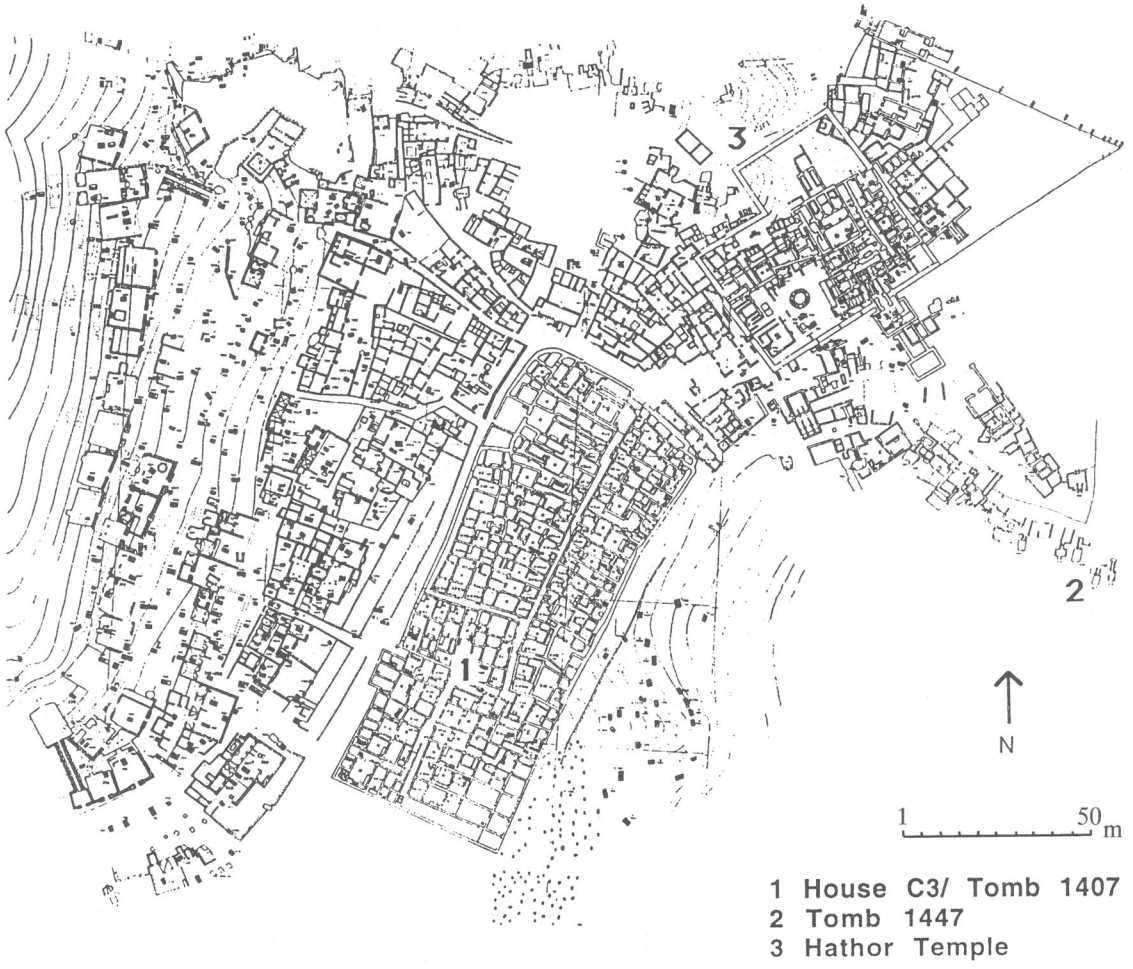


FIG. 1. Map of Deir el-Medina with locations referred to in the text marked (Redrawn from G. Castel, *Deir el-Médineh 1970. Fasc. 1. Gournet Marreï Nord* (FIFAO 12.1; Cairo, 1980).

[2] See T. G. Wilfong, 'The Western Theban Area in the Seventh and Eighth Centuries', *BASP* 26 (1989), 123–4, 145.

Deir el-Medina. Bataille realised the potential of combining the archaeological and textual data dialectically, but his impetus remains to be followed up in any detail. *Hundred-Gated Thebes*, the recent collection of papers on Ptolemaic and Roman Thebes edited by Sven Vleeming (Leiden, 1995), is an invaluable addition to our knowledge of the area as a whole, particularly regarding the relationships between the East and West Banks, but it says comparatively little about Deir el-Medina. Indeed, the Graeco-Roman evidence has never been exploited to understand the full trajectory of the site, the range of mortuary and religious practices present there, and the contextual significance of the material itself.

Deir el-Medina has been characterised as a New Kingdom 'village' first and foremost, and the absence of any comparable occupation in Graeco-Roman times has led to the site's subsequent religious and royal associations being minimised. However, various features of the New Kingdom village, and a significant number of the tombs, were later reemployed, and it is worthwhile charting the history of those structures already present before the period examined here. The Pharaonic period of occupation at Deir el-Medina began early in the New Kingdom and lasted for approximately 400 years, coming to an end sometime during the reign of Ramesses XI (*c.* 1098–1069). The archaeological and textual record suggests that the site was gradually deserted because of civil disorganisation and increasing Libyan incursions,[3] which may have led to the area acquiring a bad reputation. As the village was not easily defended, the inhabitants sought refuge in the walled mortuary temple complex of Ramesses III at Medinet Habu around Years 17–18 of Ramesses XI. His was the last tomb constructed in the Valley of the Kings, but there is no evidence to suggest that the king was ever buried in it. The subsequent pharaohs of the Twenty-first Dynasty ruled from, and were buried at, Tanis in the Delta. State economic support was withdrawn, and the *raison d'être* of the Ramesside community at Deir el-Medina ceased. However, even when the village was abandoned the former inhabitants returned to visit the chapels and use the empty houses for storage late into the Twenty-first or Twenty-second Dynasty.[4] Descendants of the Ramesside villagers must have lived throughout the Theban region and may well have returned episodically to visit family chapels and observe the funerary cult. Religious feelings were thus associated with the site, even when domestic occupation had ceased.

Deir el-Medina's intrinsic religiosity seems to have survived its shift in function from a primarily habitational to a sacred and mortuary site, associated with elite individuals. The Western Necropolis tombs at Deir el-Medina continued to be usurped from the Third Intermediate Period onwards, and in the Saite Period extensive private tombs were constructed, such as the impressive hypogeum tomb 2001.[5] Probably in the early Ptolemaic Period, the huge sarcophagi of the Divine Adoratrices Nitrocris and Ankhnesneferibre were removed from their original burials at Medinet Habu and placed in two adjacent shafts to the north of the site (contra PM I^2, 685). The coffin of Ankhnesneferibre (British Museum EA 32) was partially reinscribed for Pimontu, the prophet of Montu.

[3] B. Haring, 'Libyans in the Late Twentieth Dynasty', in R. J. Demarée and A. Egberts (eds), *Village Voices* (Leiden, 1994), 71–80.

[4] D. Valbelle, *"Les Ouvriers de la tombe." Deir el Médineh à l'époque ramesside* (BdE 96; Cairo, 1985), 125; M. L. Bierbrier, *The Tomb-Builders of the Pharaohs* (London, 1982), 119–21.

[5] For the Saite tombs, see PM I^2, 685–6.

But it is inaccurate to think of Deir el-Medina, and in fact the West Bank more generally, as predominantly a mortuary sphere in post-Pharaonic times. The later part of the reign of Ptolemy IV (222–205 BC) saw the rekindling of large-scale monumental royal interest in the site. A temple was constructed over whatever remained of the New Kingdom buildings, where the Ptolemies were co-templar gods along with the dedicatees Hathor/Aphrodite Urania and Maat. All the principal Ptolemies between Ptolemy VI and Ptolemy XII augmented and extended the temple. Ptolemy IX erected a mammisi and Ptolemy XII reinstituted work on the decorative schemes, although these were never fully completed. Later, under one of the early emperors (probably Augustus) a brick shrine was erected against the west wall of the temple. Possible motives for this continued expenditure of royal resources at the site will be examined below. On a more vernacular level, the usurped Western Necropolis tombs and intrusive burials over the site have yielded coffins, masks, decorated linen shrouds and ceramics of the Ptolemaic and Roman Periods. The burial of a high-ranking Roman family in the reused cellar of dwelling C3 in the village (fig. 1) highlights the range of mortuary practices that were being undertaken at Deir el-Medina at the time (see below).

In Greek documents, the general area of Deir el-Medina was known as 'the Memnonia' (τὰ Μεμνόνεια), after the Colossi of Memnon. 'The Memnonia' was a toponym of rather fluid meaning, which could be used interchangeably to mean the administrative district with its southern border somewhere south of Medinet Habu and the northern between Deir el-Medina and the Dra Abu el-Naga, the town of Djeme[6] which grew up around Medinet Habu, or as a collective term for the whole Western Necropolis, including Deir el-Medina. In the Ptolemaic Period, some of the inhabitants of Djeme had regular dealings with Deir el-Medina, only a kilometre due north from their homes. For instance, Petosiris, a *pastophoros* of the temple of Hathor at Deir el-Medina during the reign of Ptolemy X, owned a house in Djeme and may have travelled back and forth between the two places when he was on duty.[7] More regular visits were paid by the so-called *choachytes* (χοαχύται) or libation-pourers of Djeme, who were responsible for maintaining the mortuary cult of those buried in the 'necropolis of Djeme' (*t3 ḫ3s.t n Ḏm3*). They performed duties such as bringing food- and water-offerings to the tombs.[8] The 'necropolis of Djeme' must have included Deir el-Medina because it extended as far north of Djeme as tombs in the Dra Abu el-Naga,[9] and although this was in a different administrative district the *choachytes* still used the tombs there. The extensive archives of the *choachytes*, in Demotic and Greek,[10] record their economic activities in some detail and show them to have been a cohesive, endogamous group closely identified with the West

[6]The name Djeme itself may be derived from *st m3ʿt*, the name given to the area in the Ramesside texts: see J. D. Ray, 'Thoughts on Djeme and Papremis', *GM* 45 (1981), 58.

[7]For Petosiris, see P. W. Pestman, *The Archive of the Theban Choachytes (Second Century BC): A Survey of the Demotic and Greek Papyri* (Leuven, 1993), texts 53, 63 and 64.

[8]The best summaries of the *choachytes'* duties are in Pestman, *Archive*, particularly chapter 1, and S. P. Vleeming, 'The Office of a Choachyte in the Theban Area', in Vleeming, *Hundred-Gated Thebes*, 241–55.

[9]Contra Bataille, *Les Memnonia*, 236–7. This is corroborated by the designation of the temple of Deir el-Medina found in the Greek documents from the site (PSI IX 1016, 1019 and 1022) which describe it as that of 'Αθύρ Νονεμοντεσεμα ἐν τοῖς κατὰ τοῦς τῶν Μεμνονείων τάφοις, 'the temple of Hathor, Mistress of the Western Necropolis (Νονεμοντεσεμα = *nbt/ḥnwt imntt n t3 st m3ʿt*) alongside the graves of the Memnonia.'

[10]For these texts, see G. Botti, *L'archivio demotico da Deir el-Medineh* (Florence, 1967) and P. W. Pestman, P. Lugd. Bat. XIX 1–3 and appendix A; Pestman, *Archive*, and idem, *Il Processo di Hermias e altri documenti dell'archivio dei choachiti* (Turin, 1992).

Bank. These men and women had various links with Deir el-Medina. Their main interaction with the site would have been going to the tombs. As Pestman points out, the *choachytes* had many tombs at their disposal: 'large tombs and small ones: tombs which the owners entrusted to them and tombs which they had simply occupied, particularly older ones which had no owner any more.'[11] Their usage of these tombs would not have been limited to depositing mummies and keeping up cultic attention. They also used them to store their equipment and even their archives, and as temporary resting places for mummies in their care which were not ready to be entombed. The *choachytes* also had more public religious duties which would have taken them to Deir el-Medina, such as receiving the cult image of Amun when he visited the West Bank during the Festival of the Wadi.

Apart from the visits of *choachytes* attending to the funerary cult, other people spent time at the site of Deir el-Medina in the Ptolemaic and Roman Periods, for a host of reasons: to build, decorate and administer the temple; for festival observations and pilgrimages; and perhaps even for tourism. The evidence of some rock graffiti suggests that travellers passed through Deir el-Medina on their way to visit the popular tourist destination of the Valley of the Kings, and some at least were moved to record their experience of the place by making an obeisance or *proskynema* (προσκύνημα) to the *genii loci*. *Proskynemata* may be seen as expressions of awe and piety, a way of propitiating the dangerous aspects of local deities to obtain a sort of safe-conduct through their domain. At Deir el-Medina and its environs, Roman travellers made *proskynemata* 'in the presence of the great gods in the holy mountain' (τὸ προσκύνημα παρὰ τῶν θεῶν μεγάλων ἐν ἱερᾷ πετρᾷ)[12] or, more generally, 'to the holy place in the presence of all the gods' (τὸ προσκύνημα τοῦ ἁγίου τόπου... παρὰ πᾶσει τοῖς θεοῖς).[13] The act of *proskynema* represented a very real emotional investment in the environment. Not only did the visitors and pilgrims make a physical deference to the gods, named or unnamed, that they perceived there, but they also needed to take the time to inscribe a permanent record of their feelings in the correct ritual wording.

Therefore, in the Ptolemaic and Roman Period there is evidence for the site of Deir el-Medina being increasingly transformed into a numinous liminal space which was appropriate for a mortuary or commemorative domain, but not for a zone of permanent habitation. Parallels for this process also existed at Amarna, similarly abandoned and visted only for occasional tourism rather than used for dwelling space, and later at Djeme itself.[14] It may be relevant to consider here the work of Susan Alcock, who has discussed the concept of the sacred landscapes in Classical and Roman Greece. These, she argues, were created through a range of human activities, building, dedicating, dramatising, and ritualising social space.[15] One has to give greater significance to the embeddedness of

[11] *Archive*, 8.

[12] A. Bataille, 'Un graffite de la montagne thébaine', *BIFAO* 38 (1939), 131. He did not date this graffito, but its layout incorporating a *tabula ansata* suggests that it may be Roman.

[13] A. Bataille, 'Quelques graffites grecs de la montagne thébaine', *BIFAO* 38 (1939), 145.

[14] V. A. Foertmeyer, *Tourism in Graeco-Roman Egypt* (unpublished PhD thesis, Princeton University, 1989), 18, 30–2, 108, discusses why tourists should visit Amarna, a site which had so few obvious attractions for them. W. Godlewski, *Le monastère de St Phoibammon* (Deir el-Bahari 5; Warsaw, 1986) 77–8, presents the evidence for the abandonment and subsequent bad reputation of Djeme being connected with the aftermath of the revolt by Dihya Ibn Musʿab, a pretender to the Caliphate, in the area between AD 782 and 785.

[15] S. E. Alcock, *Graecia Capta: The Landscapes of Roman Greece* (Cambridge, 1993).

the site within a specific landscape; it is not simply a matter of discussing temples, chapels and individual finds *in vacuo*. Each of these features is contextually located and that context, or landscape, was imbued with certain associations and meanings. At Deir el-Medina the impact of the desert setting, its views across to the monuments of the East Bank, its proximity to other religious sites, the vestiges of hundreds of tombs, chapels and pyramidia and the ritual associations of its temple would all suggest an enigmatic quality that could draw people to the site. However, its reputation as dangerous territory may have been a factor which restricted permanent occupation of the site from the end of the Twentieth Dynasty. As civil unrest ended the New Kingdom habitation and continued to affect the area sporadically in the Potelmaic Period, so the landscape of Deir el-Medina took on different symbolic resonances through time.

In spite of these different meanings, the site's intrinsic power and grandeur has transcended the different cultural standpoints of viewers, from the writers of Greek *proskynemata* to Bruyère himself, who perhaps described it most evocatively when he wrote about the effects of the sun on the mountain:

> La première étincelle de l'aurore rosit sa pointe alors que le reste de la montagne et toute la plaine sont encore dans l'ombre; il flamboie au soleil de midi et le dernier brandon du couchant s'attarde encore sur ses arêtes quand le crépuscule a déjà noyé les plus hautes falaises. Si notre imagination est frappée par la cime d'occident, on conçoit que celle des Égyptiens d'antan devait l'être encore plus et l'on comprend qu'ils l'aient en quelque sorte divinisée.[16]

In a funerary religion where the cyclical process of death and rebirth was considered analogous to the movements of the sun, it may be no coincidence that Deir el-Medina continued to be such an attractive location for tombs.

Mortuary archaeology of Graeco-Roman Deir el-Medina

Bruyère's excavation focus was upon the site in the New Kingdom, yet he still recorded a significant amount of later material deposited in reused tombs in the Western Necropolis. As a result of his personal expertise and interest in the New Kingdom, it is likely that some of the post-Pharaonic material may have been overlooked or misclassified, a situation which might be rectified if one could reconstruct these tomb assemblages from the extant material in the Deir el-Medina magazines. However, it is still possible to derive some useful information from Bruyère's published reports. Approximately 75 tombs in the Western Necropolis[17] contained notable finds, and this figure might well be increased with more specialised knowledge of these later finds, particularly the ceramics. The chart (fig. 2) illustrates the specific, and comparatively limited, range of post-New Kingdom finds at Deir el-Medina and provides a breakdown for the ratio of artefacts contained in these tombs. Unlike the abundant material from the Eighteenth to Twentieth Dynasties,

[16] B. Bruyère, *Rapport sur les fouilles de Deir el Médineh (1935–1940) Quatrième Partie* (FIFAO 22.1; Cairo, 1948), 12.

[17] Over 300 tombs in the general area of the Western Necropolis have been numbered, but not all of these were recorded in detail by Bruyère. For our purposes here, the Western Necropolis refers to the western slope opposite the village, including the Eighteenth Dynasty cemetery and tombs situated to the north of the site in the vicinity of the temple. The data for these Ptolemaic and Roman tombs are scattered throughout Bruyère's site reports, although some are collected by Bataille, *Les Memnonia*, 185–7.

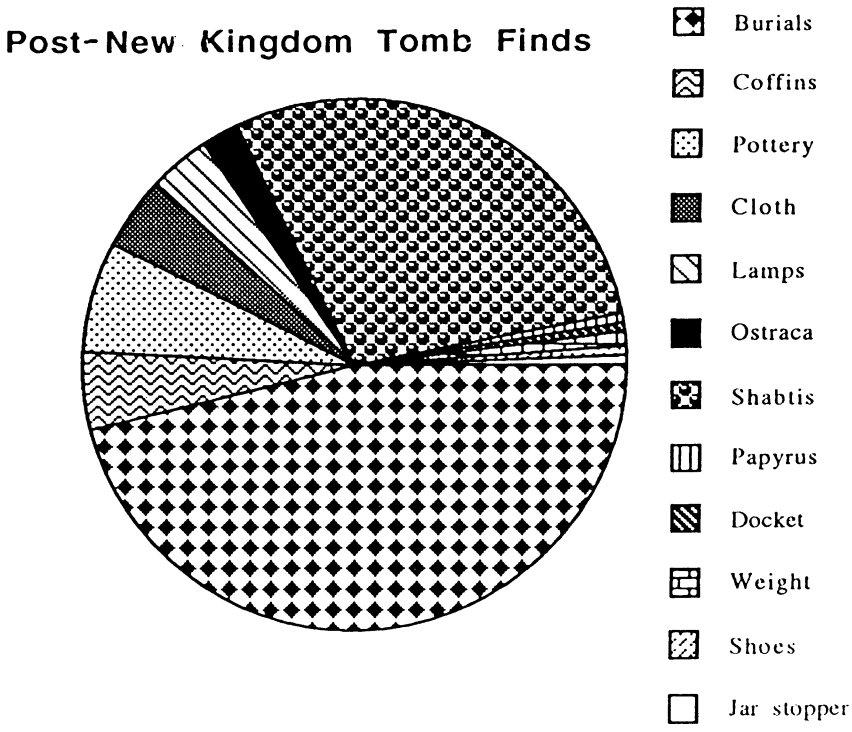


FIG. 2. Chart showing the relative ratios of post-New Kingdom tomb finds at Deir el-Medina.

which illustrates the full spectrum of domestic, mortuary and commemorative activities undertaken at Deir el-Medina, the later finds primarily reflect the relative simplicity of burials in reused tombs. The quantity of material strictly relating to domestic functions is negligible, pottery being the only ambiguous category.

From Bruyère's reports, the post-New Kingdom evidence appears to be scattered and inconsistent, although one can make certain propositions about how later occupants were utilising the site. The nature and density of material supports the notion of significant patterns of later usage, which at present can be grouped into three types: 1) scattered intrusive finds; 2) domestic reuse of tombs (primarily in Late Antique times); and 3) significant occupation and tomb remodelling.[18]

The first category, scattered intrusive finds, generally consists of Graeco-Roman and Late Antique ceramics (tombs 1150, 1346, 1440, 1450, 1451), papyri (tomb 1446), shabtis (tombs 336, 1006) decorated linen (tombs 330, 1060, 1447, 1450) and isolated coffins (tombs 1006, 1022). However, these individual finds still merit attention and are testimony to the type of individuals and practices present at Deir el-Medina.[19]

The second category is remodelling of extant tombs, especially noticeable in the

[18]This practice was not exclusive to Deir el-Medina, as evidence from the Valley of the Nobles suggests extensive reuse post-New Kingdom: N. Strudwick, *The Tombs of Amenhotep, Khnummose, and Amenmose (TT294, 253, and 254)*, Oxford, 1996), *passim*.

[19]B. Bruyère, *Rapport sur les fouilles de Deir el Médineh, Troisième Partie (1926)* (FIFAO 4.3; Cairo, 1927), 10–13, illustrated a unique Roman coffin in tomb 1022 with leaf motifs and a bird-headed human figure in brown paint on a lime-washed base.

Western Necropolis and around the temple area to the north of the site. This may relate to the proximity of the temple of Hathor as a potent ritual locale with funerary associations, which is discussed later. In the Western Necropolis tombs such as 1138 and 1233 were remodelled into structures resembling catacombs in the Late Period and Ptolemaic Period respectively. In the region of the temple, tomb 1438 demonstrates both Late Antique and post-Muslim conquest alterations, whilst tomb 1437 was also reused by Christians who replastered the walls white, decorated it with Coptic crosses, and altered the structure for occupation.[20] Tomb 1448 was filled with straw and water vessels, apparently having been reused in Late Antique times as a stable. In tomb 1126 there was a potter's kiln along with lamps and wine amphorae.[21] This set of structures to the north and east of the village seems to have been the most conducive for temporary reoccupation and habitation, as opposed to the houses within the enclosure. Late Antique occupation of the site was thus more domestic in character than any since the village was abandoned at the end of the New Kingdom.[22] Though Late Antique material is found in many tombs, discrete burials were only discovered within the Christianised temple precinct, datable to the sixth or seventh century AD. Bruyère recorded a total of nine elaborately wrapped bodies from this period, whom he presumed to be monks.[23] It is possible, however, that other individuals were buried within the precinct walls, since Bruyère suggested that the Christian cemetery extended further to the north-east toward the temenos. However, general usage *per se* appears to have been low density and concentrated around the temple, which remained the focal point of the site throughout the Graeco-Roman and Late Antique Periods.

The third category of subsequent activity, significant reuse and remodelling, is most telling in terms of levels of tomb reuse and reconstruction as well as burial practices. Numerous tombs in the Western Necropolis housed great numbers of bodies dating from the Third Intermediate Period to Graeco-Roman times; Christian burials do not seem to have been located in this part of the site. Exact numbers of individuals were not recorded by Bruyère, in part because of the great disturbance of the burials, where bodies were disarticulated, but also because of his own lesser interest in the material. For example, tombs 1059, 1060, 1138, 1140, 1197, 1344A and 1447 were recorded as being 'remplies de momies noires',[24] of Late Period date amongst the vestiges of earlier New

[20] B. Bruyère, *Rapport sur les fouilles de Deir el Médineh (années 1948 à 1951)* (FIFAO 26; Cairo, 1953), 110. In house SW5 of the village, once the dwelling of Khabekhenet, Bruyère discovered a bas-relief dating to the Christian Period, suggesting that structural remains must have still been visible at the time. The fact that this find is unique suggests that there was negligible Late Antique reoccupation of the village for extended habitation: see B. Bruyère, *Rapport sur les fouilles de Deir el Médineh, (1934–1935) Troisième Partie* (FIFAO 16; Cairo, 1939), 327–8.

[21] B. Bruyère, *Rapport sur les fouilles de Deir el Médineh (1926) Deuxième Partie* (FIFAO 4; Cairo, 1928), 27–30.

[22] According to G. Nagel, *La Céramique du Nouvel Empire à Deir el Médineh*, I (DFIFAO 10; Cairo, 1938), 121–3, there is some possibility that post-New Kingdom ceramics were once stored and subsequently looted from an unspecified house cellar in 1921. Amongst the assemblage were large amphorae and storage vessels, some containing grain. Because the group was unprovenanced and the result of clandestine digging, it is difficult to draw conclusions about the later domestic reuse of village structures from it.

[23] Very similarly prepared bodies were excavated in 1971 at the Monastery of St. Mark in the Qurnet Murai: see G. Castel, 'Étude d'une momie copte', in *Hommages à la mémoire de Serge Sauneron (1927–1976)* (Cairo, 1979), II, 121–43.

[24] This term was applied to various tombs, but see 1447 particularly, in B. Bruyère, *Rapport sur les fouilles de Deir el Médineh (1948–51)* (FIFAO 26; Cairo, 1953), 104–6.

FIG. 3. Painted shroud from tomb 1447.

Kingdom assemblages and human remains. In the Ptolemaic Period numbers of bodies were deposited into tombs 1126, 1233 and 1346, and in Graeco-Roman times into tombs 1126, 1140, 1153, 1154 and 1155. Datable Roman mummies appear in tombs 1332A and B and 1447, where there is an entire catacomb containing at least 60 Roman mummies, some with high-quality masks and shrouds (fig. 3), including a significant number of females and children.[25] None of these tombs appears to have been constructed at the time of deposition; the reuse of tombs with mixed tomb assemblages and bodies suggests a certain disregard for the actual context of the burial itself. Placing coffins in amongst the disarray of previous occupations would further support this idea. The lack of substantive burial assemblages which characterises post-New Kingdom mortuary praxis would also suggest that it was not the paraphernalia but the body which became the single focus after death. This culminates in Graeco-Roman times, when the material expression of death centres on the body itself, which then becomes an elaborately wrapped and decorated burial in microcosm. We witness the beginning of this shift in focus towards the end of the New Kingdom, with the ever-dwindling array of associated tomb goods and a reduced concern for personalised tombs.[26]

This development is perhaps best illustrated by a family burial not from the Western Necropolis, but from the New Kingdom settlement itself, in house C3 (see fig. 1). We now intend to consider this unique Roman burial within the settlement precinct of Deir el-Medina, bearing in mind that space is socially produced, so that different communities and individuals experience their lives, and deaths, in different spaces.[27] These experi-

[25] B. Bruyère, *Rapport sur les fouilles de Deir el Médineh (années 1948 à 1951)*, 104–10, fig. 32 and pls. xxiii–xxv.

[26] For full archaeological analysis of the evidence of this from Deir el-Medina, see L. M. Meskell, *Egyptian Social Dynamics: The evidence of age, sex and class in domestic and mortuary contexts* (unpublished PhD thesis, Department of Archaeology, Cambridge University, 1997).

[27] C. Tilley, *A Phenomenology of Landscape: Places, Paths and Monuments* (Oxford, 1994), 10.

ences are naturally conditioned by factors such as ethnicity, age and social status, the last two perhaps being especially relevant to this interment.

The tomb of Pebos and his family (tomb 1407/house C3)

In the cellar of house C3 Bruyère recovered the undisturbed burial of nine members of a Roman family, seven of whom were in fine wooden coffins, while two wrapped bodies were without coffins.[28] The five coffins, two of which held two individuals apiece, were inscribed in Greek with the names and genealogies of their owners, and the palaeographical dating of these inscriptions allows us to reconstruct the sequence of death to some extent. The bodies of at least two generations were interred. To transform the cellar into an appropriate burial place, some structural modifications were made. This could perhaps be seen as an adaptation of the practice of remodelling old tombs in the Western Necropolis. In addition to the Roman burials, the cellar also yielded the Third Intermediate Period coffin of a priest of Amun containing two further bodies in a very poor state of preservation. The relationship of this to the rest of the burials in the cellar is unclear.[29] Bruyère seems to have believed that the people who adapted the cellar in the Roman Period came across the burials in the coffin already there and did not disturb them; however, it may have been that these were connected to the family crypt. Bruyère gave no information about the method of mummification or any other details which might enable one to date it more accurately.

The central figure of the interment is a man called Pebos, son of Krates, who died aged 73 in an unknown year. His body occupied the optimum position in terms of east–west burial orientation, lying at the foot of the cellar steps (fig. 5). All the other people in the cellar whose affiliations are given seem in some way to be related to him, and it is possible that the unidentified individuals were also from his family (fig. 4). Apart from Pebos himself, we apparently have his unnamed wife and their son Krates, aged six, in a single coffin; Senamphiomis, a niece of Pebos' wife; and a man called Krates son of Psenmonthes, also called Pebos son of Krates, who might have been a brother of the principal Pebos.[30] The last coffin deposited in the cellar, which blocked up the entrance from the stairs, is the only one which is dated: it is that of a first-cousin of Pebos' wife, an eleven-year-old girl called Sarapias. The inscription on her coffin is dated to 30 Hathyr in the seventeenth year of an unnamed emperor; this could be the date of death or of burial.

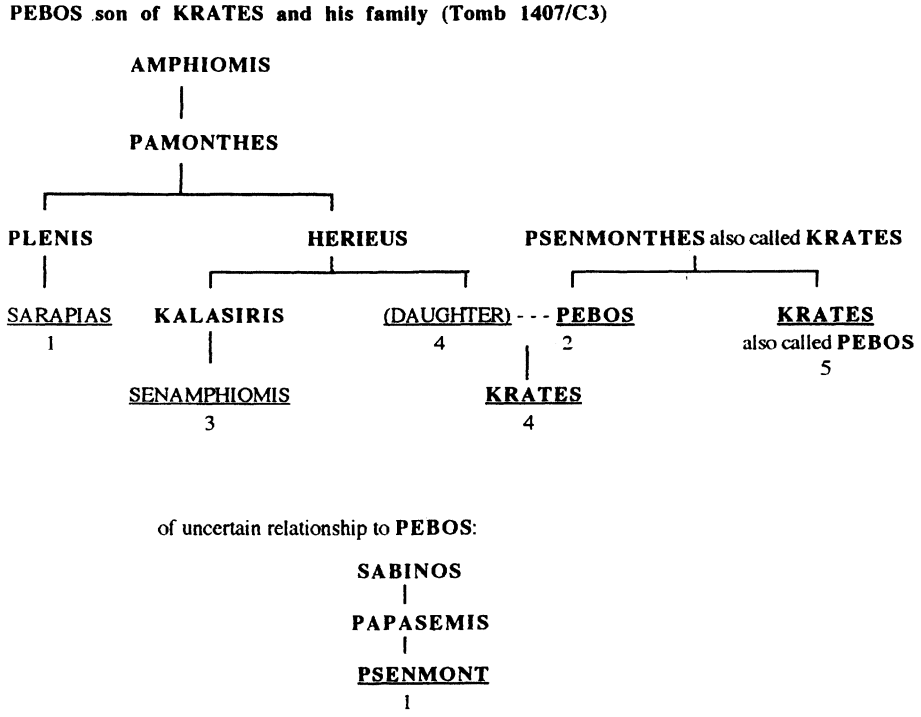
[28] The find was published in two parts by B. Bruyère and A. Bataille, 'Une tombe gréco-romaine de Deir el Médineh', *BIFAO* 36 (1937), 145–74 (description of the discovery and publication of the coffin inscriptions) and *BIFAO* 38 (1939), 73–107 (examination of the mummies and publication of inscriptions on the bandages).

[29] Contra Bruyère, *BIFAO* 36, 149, who dated this reused coffin to the Ramesside Period. Given the title of the original occupant, it is probably foreign to the site; priests of Amun were not buried at Deir el-Medina and as such, the coffin is doubly intrusive here. If this was indeed an original Ramesside burial, it would not have been interred in a domestic cellar in a house that was in use in the Ramesside Period, as C3 was.

[30] Bruyère and Bataille, *BIFAO* 36, 172, assumed that Krates son of Psenmonthes also called Pebos son of Krates was the nephew of Pebos, but he could have been his brother if we allow that Pebos father Krates and Krates' father Krates, also called Psenmonthes, were the same man. The best evidence for this is the palaeography of Krates' coffin and bandage inscriptions, which suggest that he died earlier than Pebos. Also, if Pebos died aged 73 in the early third century, and Krates aged 17 apparently in the mid-second century, they were probably born about the same time. The fact that they would both have borne the name Pebos is not a problem, as other instances of full siblings with identical personal names are known from Ptolemaic and Roman Egypt. A Theban example is the two daughters of Dryton from Pathyris both called Apollonia; see N. Lewis, *Greeks in Ptolemaic Egypt* (Oxford, 1986), 90.

In the same coffin as Sarapias was the body of another eleven-year-old, Psenmont son of Papasemis, whose relationship to the other individuals cannot be traced.

There is strong circumstantial evidence that this was a local family who had achieved some national prominence. Firstly, Pebos son of Krates and Krates son of Psenmonthes bear a high-ranking religious title, *neokoros* of the great Sarapis (νεωκόρος τοῦ μεγάλου Σαράπιδος). Bruyère and Bataille assumed this to have been a local priestly title connected with an unknown Serapeum in the vicinity of Deir el-Medina. However, the papyrological and epigraphic evidence shows that this was an important office in the Serapeum at Alexandria, often held by Roman citizens who also held other major civic titles such as *gymnasiarch*, *exegetes*, member of the *boule* or even member of the Museion.[31] Most attestations of *neokoroi* in the papyri show that they lived in Alexandria itself or the Greek *metropoleis* in Egypt, and in fact, Pebos and Krates are the only holders of this title known from the Thebaid. Secondly, there is the high quality of the burials themselves (see pl. XXIII, 1). Bruyère's examination revealed that the bodies had been well-embalmed, showing signs of evisceration, with the skin of some individuals



Males are indicated in bold type. Names of individuals with coffins are underlined and have the corresponding coffin number indicated below. The numbers refer to those assigned to the coffins by Bruyère in the 1935-40 volume.
- - - indicates a presumed marriage.

FIG. 4. Family tree of occupants in tomb 1403/C3 at Deir el-Medina.

[31] For third century examples see e.g. P. Mich. 11 620: P. Alex. Giss. 5; P. Stras. 1 10. A good example of such an individual is the *neokoros* Calpurnius Horion, a Roman knight, former *exegetes* and member of the Alexandrian *boule* in the mid-third century AD, attested from P. Oxy. XL 2938.

partially gilded and the mummies protected with amulets. Some of the bodies were elaborately wrapped in numerous layers of linen—the child Sarapias had 42 layers of bindings and shrouds, for example—and their cartonnage masks were of fine workmanship, contrasting strongly with the poor-quality examples from contemporaneous burials elsewhere in the Theban area. This elite family's burial becomes even more striking when one notes that most of the individuals mentioned in the inscriptions from 1407/C3 bear theophoric names relating to local Theban cults. For instance, the names Pebos, Psenmont, Plenis and Pamonthes honour the cult of Buchis at nearby Armant, and names like Kalasiris, Senamphiomis and Herieus are typical Theban personal names.[32] Their titles and onomastics suggest that Pebos and his relatives, in spite of their links with elite civic institutions in the capital, maintained a strong personal identification with their place of origin, to the extent that they were taken back there to be buried. From the Roman Period, numerous mummy labels and papyri document the transportation of mummies from the place of death back to the place of origin, and the practice of burial in the home town after absence elsewhere.[33]

Only the double burial of Sarapias and Psenmont is dated, to Year 17 of an unnamed emperor. Since Bataille first published the coffin inscriptions from 1407/C3 in 1936, a much greater corpus of comparative palaeographical data has grown up which can assist in reconstructing a sequence for the writing of the inscriptions, and thus for reconstructing the order of death. Bruyère's coffins 3, 4 and 5 (fig. 5) appear to be inscribed in earlier-looking hands than those of coffins 1 and 2. Coffin 5 (SB VI 9318 V) of Krates son of Psenmonthes, also called Pebos son of Krates, is inscribed in what seems to be a mid-second century hand, fairly formal but with some typical second century cursive traits, such as the *epsilon* of νεωκόρος. Parallels mostly come from private letters which tend to be undated, but compare BGU II 423 of *c.* AD 150. The brief embalmer's dockets on his wrappings are also in mid-second century hands.[34] The inscriptions of Pebos' wife and child (SB VI 9318 IV), and the wife's niece Senamphiomis (SB VI 9318 III), were written in an identical hand, presumably on the same occasion. This inscription too seems to date to the second half of the second century AD, and is rather like a less elaborate version of P. Mert. II 71, datable to AD 160–163. More distinctive are the dockets on the coffin of Pebos himself (SB VI 9318 II) and of Sarapias and Psenmont (SB VI 9318 Ia–b), which are almost certainly early third century AD. Pebos' inscription is reminiscent of later Severan period scripts, such as the first hand in P. Berol. 11532 of AD 209 (see Schubart, *PGB*, 35). The Year 17 mentioned in the ink inscription on Sarapias' and Psenmont's coffin would form a *terminus post quem*, dating the burial to either 1 December 176 or 1 December 208. The later date seems more plausible palaeographically, on analogy with hands like that of BGU I 97 of AD 202/3 (see Schubart, *PGB*, 34a); the letter-forms here are similar though written with a finer pen.

The evidence of the inscriptions may clarify the pattern of Roman usage in 1407/C3. They could attest to at least two multiple interments: three bodies on one occasion,

[32] A useful selection of sources relevant to Theban names in 1407/C3 is given by K. Vandorpe, 'The Soter Family: Genealogy and Onomastics', in Vleeming, *Hundred-Gated Thebes*, 229 nn. 202–6: on Kalasiris, see also J. Winnicki, 'Pkalasiris, ein fremder Gott im römischen Ägypten und die Personennamen auf Kal-', *Journal of Juristic Papyrology* 23 (1993), 169.

[33] See B. Boyaval, 'Le transport des momies et ses problèmes', in F. Hinard (ed.), *La mort au quotidien dans le monde romain* (Paris, 1995), 109–15.

[34] Bruyère and Bataille, *BIFAO* 38, 96–101, pls. viii, ix.

probably late in the second century AD (Pebos' wife and child and his wife's niece), and the double burial of the children Sarapias and Psenmont, probably in AD 208. We could therefore have evidence for multi-generational usage, with the tomb being reopened to deposit bodies, perhaps of individuals who had died elsewhere in Egypt and eventually been taken back home, after being kept for some time. Alternatively, the deposition of these bodies in the cellar could represent a single act, such as the clearing out of a family chapel where mummies from several generations had been stored, a practice well attested in the Roman cemeteries at Hawara.[35] This hypothesis perhaps becomes more likely if we look at the internal dimensions of the cellar, which appear to have been measured to incorporate that exact number of coffins. The whole venture seems to have been an awkward one, both in cutting the rock and manoeuvring the coffins themselves into such a 'local exigu', as Bruyère put it. A short east–west extension was cut to accommodate the coffin of Pebos, with very little room to spare. This neatness of fit seems too much of a coincidence and such a circumscribed, inflexible space could not have been meant to be modified or extended to take more bodies, as he goes on to suggest.

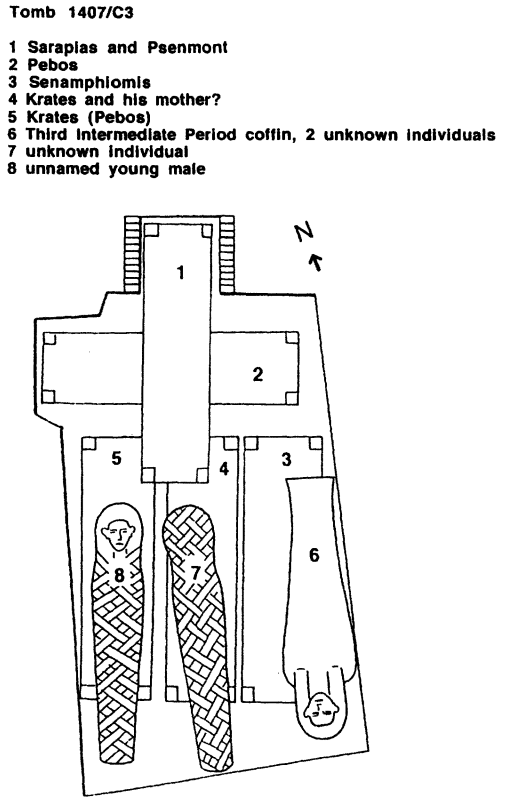


FIG. 5. Placement of coffins in tomb 1407/C3 at Deir el-Medina.

[35] See D. Montserrat, 'Death and Funerals in the Roman Fayum', in M. L. Bierbrier (ed.), *Portraits and Masks in Roman Egypt* (London, 1997), 33–44, for a discussion of the evidence for keeping the bodies around after mummification.

The unique nature of this elite burial in a decidedly domestic context, far removed from the other Graeco-Roman burials at Deir el-Medina, prompts the question: why occupy this non-funerary space? At least 31 of the 68 New Kingdom dwelllings at Deir el-Medina were equipped with a cellar, but only three contained interments; two had much earlier Eighteenth Dynasty burials, over which the Ramesside houses had been constructed, and the third held the family of Pebos. Perhaps C3's spatial demarcation, far removed from the heavily reused tombs of the Western Necropolis, had in itself some special status. Functionally, it may have been easier to conceal, a less obvious target for looters. It nonetheless appears unusual. Why would the family have ignored the obvious funerary associations of the Western Necropolis tombs? One might speculate that the chaos of ransacked tombs containing the human and material debris of other occupants proved too unpleasant. This potentially tells us something of changing mortuary sensibilities in this period and for people of this class, with the emphasis having moved from externalised tomb goods and paraphernalia towards the contained burials of individual, heavily elaborated bodies. Apparently a range of burial practices was being undertaken at Deir el-Medina in this period, each coexisting within the larger entity of the site and utilising that space differently. This was also the case in other Roman cemeteries, such as Hawara.

Comparisons for the ways in which other wealthy Theban families employed ancient structures for their burials in the second century AD are provided by two other tombs in the area: tomb 1447[36] in the Western Necropolis of Deir el-Medina, and TT 32 nearby in the Asasif, which probably housed the interment of the family of Soter, '*archon* of Thebes' in the late first–early second century AD.[37] Tomb 1447 was remodelled more extensively than C3, so that the Ptolemaic and Roman mummies could be placed in a part of the tomb separated from the earlier burials. At some point tomb 1447 may have been reused by the professional association of *choachytes* rather than an individual family. As Pestman, quoted above, points out, the *choachytes* of the necropolis of Djeme took charge of ownerless tombs—for their purposes, the bigger the better. They controlled one of the largest private tombs in the whole Western Necropolis, that of Nebwennef in the Dra Abu el-Naga. In tomb 1447, the high quality shroud-paintings and cartonnages, perhaps even of better workmanship than those of 1407/C3 (fig. 3), show that we are dealing with some wealthy individuals, but in the absence of textual data from this tomb it is impossible to determine their exact social position. Yet the fact that this group shares the hypogeum with the remains of at least 60 individuals serves to accent the uniqueness of the method of interment Pebos and his family received. The burials in tomb 1447 probably represent repeated depositions in the tomb over several generations rather than a single deposition from a funerary chapel, if this theory about 1407/C3 is right. This former pattern of usage can be proved from the tomb of Soter and his family. Five dated inscriptions on their mummies show that the tomb was used to bury individuals who had died between AD 109 and 146, one of them explicitly stated to have died on 16 January 127 but not been buried until 8 November of the same year.[38] Thus, comparison of TT 32, 1407/C3, and tomb 1447 at Deir el-Medina illustrates the diversity

[36] B. Bruyère, *Rapport sur les fouilles de Deir el Médineh (1948–1951)* (Cairo, 1953), 104–10.

[37] See L. Kákosy, 'The Soter Tomb in Thebes', and K. van Landuyt, 'The Soter Family: Genealogy and Onomastics', in Vleeming, *Hundred-Gated Thebes*, 61–82.

[38] Van Landuyt, in Vleeming, *Hundred-Gated Thebes*, 77–8.

of individual responses to the same locale, suggesting that usage of mortuary space was intimately related to the formation of biographies and social relationships.[39]

The temple of Hathor at Deir el-Medina

Along with the mortuary archaeology, the temple of Hathor at Deir el-Medina shows how the site continued to be important in the Ptolemaic and Roman Periods. Irrespective of any personalised involvement, the Ptolemies constructed and used the temple to express statements about their power and hegemony in the often-contested Theban area in much the same way that the Pharaohs used the monumental architecture of Thebes as a tangible display of dynastic ideology. The history of the temple's rather fitful construction mirrors the waxing and waning of royal power in the area, and shows how material remains represent the paraphernalia of such power. In view of this considerable Ptolemaic investment in the site, focused on a functioning cult temple with the usual complement of staff and ritual activities, Graeco-Roman Deir el-Medina can hardly be seen as an abandoned ghost town.

Reconstruction of the temple was initiated under Ptolemy IV and it was apparently dedicated to Hathor/Aphrodite Urania and Maat.[40] It is not known what remained of the New Kingdom structure by this time, nor what prompted Ptolemy IV to choose this site as part of his nationwide temple-building programme after the battle of Raphia in 217 BC; Bruyère suggests that the residual religious feelings associated with Deir el-Medina may have been a consideration.[41] By the end of his reign, the decoration of the north and south naoi and the central sanctuary was well underway. The work was probably suspended for a decade or more during the disturbances in the Theban area following his death and the accession of the child Ptolemy V Epiphanes in 205/4 BC, but the temple was functioning ritually and bureaucratically by April 188 BC, about three years after Ptolemy V had regained control of Thebes from the local ruler Chaonnophris.[42] Ptolemy V seems to have been interested in manipulating Deir el-Medina and its temple, and indeed the religious monuments of the East and West Banks generally, as statements of royal dominance and self-legitimation after the humiliating reigns of Chaonnophris and his predecessor Haronnophris.

The main evidence for royal interest in exploiting Theban cults for political purposes comes in a decree inscribed on a Greek stela of Ptolemy V.[43] This was originally erected in the dromos of the temple of Amun at Karnak, probably around 191 BC when Epiphanes had finally taken control of Thebes from the rebels. The damaged upper part of the stela

[39] Tilley, *Phenomenology of Landscape*, 11.

[40] On the dedicatee see n. 9 above; Ray, *GM* 45, 58; W. C. Hayes, 'A Foundation Plaque of Ptolemy IV', *JEA* 34 (1948), 114–15, especially n. 3.

[41] Bruyère, *Rapport sur les fouilles de Deir el Médineh (1935–1940) Quatrième Partie*, 27: 'Les temples funéraires des rois n'étant pas compris dans ce vaste plan politique, et pour cause, le fait que les Ptolémée ont édifié des monuments à Medinet Habou, à Deir el Bahri et à Deir el Médineh est une preuve que ces lieux saints avaient été destinés à la gloire des dieux plus qu'à la mémoire des mortels.' The fact that the Pharaonic Hathor temple at Deir el-Medina was a state temple rather than a shrine maintained by the local community may also be relevant: on this point, see Valbelle, *"Ouvriers"*, 168–9, 326–7.

[42] See G. Botti, *L'archivio demotico*, 25; P. W. Pestman, 'Haronnophris and Chaonnophris', in Vleeming, *Hundred-Gated Thebes*, 103–7.

[43] Text = SB I 4542, re-edited with some new fragments by G. Wagner, 'Inscriptions grecques du temple de Karnak', *BIFAO* 70 (1971), 1–21.

seems to start with a reference to the 'embarcation... to the Memnonia' (εἰς τὰ Μεμνόνεια [...] ἐνεβέβηκει). A consecutive translation of the inscription becomes possible around line 10, which seems to refer to Ptolemy reinstating a festival of the barque of Amun, perhaps because the rituals had been interrupted during the Theban revolt: '... in the same month, on the ninth day, for the festival of Amun, the divine image will be placed on it [i.e. the divine barque] and conveyed to the temple, in the manner of the other crossings (διάβασεις) [...] the temple of Amun having been greatly honoured and the votive offerings having been preserved as well as the surrounding walls, the pylons, the city and all the other places.' The text goes on to integrate Ptolemy V with his predecessors, 'the kings of old (βασιλείοι ἀρχαίοι)' as the initiator of major building programmes which both honour the gods and are a tribute to the piety and enthusiasm (εὐσέβεία καὶ σπουδή) of the king. These pious acts are to be recorded by a trilingual inscription in hieroglyphs, Demotic and Greek.

Some aspects of this inscription may be relevant to the relationship between royal power as manifested on the East Bank and in the temple of Deir el-Medina. Firstly, there is the mention of a barque festival of Amun and his image's 'other crossings' to the West Bank. Although several boat processions of the image of Amun are known, such as the 'Festival of the Decade', one of those referred to in the stela must be the annual Festival of the Wadi, when the divine image of Amun visited the cult and mortuary temples of the West Bank, finishing at Deir el-Bahri. In Ptolemaic times, this was a major public event, attended by important public officials such as the *epistrategos* of the Thebaid as the representative of the crown. In the Pharaonic period, Amun's barque stopped at the temples of Deir el-Medina during the festival procession, and it must surely have continued to do so in the Graeco-Roman Period, when the much grander Ptolemaic temple was built there. Indeed, inscriptions in the north sanctuary of the temple mention the festival.[44] Secondly, there is the reference to the preservation of the temple of Amun at Karnak during the reigns of Haronnophris and Chaonnophris, along with the city of Thebes itself and 'all the other places' associated with the god. As Wagner, who re-edited the stela, has suggested, 'Quant à «tous les autres lieux», ils doivent être le temple de Louxor et toute la rive gauche.'[45] If this is the case, the stela of Ptolemy V suggests that the temple of Deir el-Medina was one of a constellation of potent locales imbued with religious and political significance, an integral element of the entire religious complex that made up Thebes. The priesthood of Amun at Thebes had long resisted control from Alexandria, and Ptolemy V's interest in the Theban cult may express his wish to rule over a united Egypt. As Dorothy J. Thompson has pointed out, 'the progressive pharaonization of the Ptolemies, of their queens, and of their families may be seen as reinforcing the acceptance of immigrant rule among a native population.'[46] It may be significant that building work on the much more impressive temple at Edfu was also interrupted by the revolts in Upper Egypt. Unrest continued in this area later than in the Thebaid, so that work on the temple of Horus was not revived until after Ptolemy V's death.[47] As Ptolemy V re-established the functioning of the traditional cults around Thebes, the monuments

[44] PM II², 406 (30 c and d).
[45] *BIFAO* 70, 18.
[46] *Memphis Under the Ptolemies* (Princeton, 1988), 125.
[47] See Pestman, in Vleeming, *Hundred-Gated Thebes*, 103, 110–11.

there became a sort of substitute for the stalled Edfu temple as a tangible locus for expressing royal power in Upper Egypt.

On the usage of the temple of Hathor by private individuals, the papyrological and epigraphic record from Deir el-Medina has little to say. The Demotic archive of the temple staff published by Botti[48] mostly concerns their internal economic relationships with the temple, such as sales of liturgic days among the priests. No Greek graffiti or *proskynemata* have been recorded from the temple itself, suggesting that pilgrims were rare or that outsiders were monitored. A Demotic graffito on the roof, recording where one Psenchonsis prayed in the presence of the goddess, could point to occasional visits by pilgrims, but this may have been written by a member of the temple staff.[49] There is no evidence for votive offerings being deposited or oracular consultations being made at the shrine. All this may suggest a very different pattern of use from the other nearby temples, such as Deir el-Bahri, where some Ptolemaic graffiti record very specific and personal requests to the gods by the visitors.[50] Perhaps Deir el-Medina possessed a different character from the other local shrines, playing a greater role in state occasions, like the Festival of the Wadi, or in individuals' funerary aspirations. The temple's location within a well-established necropolis and its dedication to Hathor had a tangible influence on its decoration and function. The unique iconography of the south sanctuary, where the judgement scene from BD Chapter 125 is associated with a representation of Anubis with the lunar disc, may substantiate these associations with death and rebirth.[51] Demotic and Greek texts talk of the temple as that of Hathor, 'mistress of the Western Necropolis', or of Hathor 'alongside the tombs of the Memnonia'. Alternatively, it may be that requests for favours or *proskynemata* to the goddess once existed but were not preserved as the mudbrick of the enclosure wall eroded. The Festival of the Wadi was probably no longer operating by Roman times. The latest reference in a documentary source is to 117 BC,[52] though Diodorus Siculus (I 97.9), writing in the reign of Ptolemy XII, still refers to it as a current event. It may have been interrupted during another series of local revolts in the reign of Ptolemy IX, never to resume. However, there was still major work going on in the temple, with additions by Ptolemy X and Ptolemy XIII.[53]

In the Roman Period, documentation for the site becomes more scanty. The Greek toponym τὰ Μεμνόνεια is a problem here; because it is geographically imprecise, it is

[48] *L'archivio demotico, passim.*

[49] W. Spiegelberg, *Demotica*, II (Munich, 1928), 24: 'May the vital name of Psenchonsis, son of Djeho, remain here in the presence of Hathor, the great goddess, mistress of the west' (*p3 rn nfr (n) P3-šry-(n)-Ḥns s3 Ḏd-ḥr mn di [m-b3ḥ] Ḥwt-Ḥr t3 ntr.t ꜥ3t ḥnw.t imntt)*. The name 'Psenchonsis' may suggest a local visitor.

[50] On this, see J. Karkowski and J. Winnicki, 'Amenhotep, Son of Hapu and Imhotep at Deir el-Bahari—Some Reconsiderations', *MDAIK* 39 (1983), 102: in one Demotic text from Deir el-Bahri a woman, Senamounis, entreats the deified Amenhotep to cure her of her sterility.

[51] PM II², 405–6, scenes 27–8. For the role of Anubis as agent of resurrection, see R. K. Ritner, 'Anubis and the Lunar Disk', *JEA* 71 (1985), 149–55. On Hathor as a funerary deity in this context, see G. Pinch, *Votive Offerings to Hathor* (Oxford, 1993), 172–83; the Hathor of the Deir el-Medina temple is the goddess of the West and nourishes the deceased in the afterworld. The linking of Maat with Anubis in the shrines at the Deir el-Medina temple also suggests a localised cultic manifestation with particular mortuary associations. We are indebted to John Baines for suggesting this.

[52] *UPZ* 162. Some Greek graffiti in the Luxor temple seem to suggest that the Festival may have been going on quite late into Ptolemaic times, but they are difficult to date accurately: see H. Riad, 'Quelques inscriptions grecques et latines du Temple de Louxor', *ASAE* 60 (1968), 281–95.

[53] PM II², 401, 407.

difficult to know to which part of the general area the documents mentioning it refer. At any rate, Deir el-Medina was not one of the regular stops on the elite tourist trail that took in the Colossi of Memnon and the Valley of the Kings, then known as the Syringes. Evidence that some later visitors visited the site is provided by the elaborate graffito on the wall by the main portal which seems to represent the god Heron, widely worshipped in Egypt in the Roman Period (see pl. XXIII, 2). Like other temples, that of Hathor at Deir el-Medina would have had non-religious functions as well. For instance, the local notary (*monographos*) for the writing of Demotic documents could act from the temple at Deir el-Medina, although he usually operated from Medinet Habu.[54] All in all, the record is thin for vernacular use of the temple and its environs. Among the post-New Kingdom archaeological finds associated with the shrine, Bruyère noted a significant quantity of Ptolemaic ceramics, and fragments of stelae, sculptural and architectural elements, as well as ostraca (one literary), scraps of papyrus, and coinage. At least some of these may be the remains of temporary occupation by those building the temple. There was little Late Antique representation, mostly consisting of ostraca, papyrus, amphora stoppers decorated with Coptic crosses, and other ceramic forms.[55] Also dating to this period were several substantial brick constructions; rooms, kitchens, ovens and silos were probably part of the monastery, whose name is not yet known.[56]

Conclusion

st mꜣʿt, the Memnonia, Deir el-Medina: names create landscapes. The process of naming a particular place captures it in social discourses, so that the name bestowed acts as a sort of mnemonic, both for the character of the environment itself and for the historical actions of individuals and groups in that environment. It is worth recalling the Greek name for the whole area, 'the Memnonia', after one of the miraculous colossal statues, the last remains of Amenhotep III's mortuary temple, that supposedly sang to greet the rising sun. Strabo and Diodorus Siculus, the main classical writers to mention the West Bank monuments and the environs of Deir el-Medina, characterise the area in two ways: as an encapsulation of vanished royal glory, and as a place of awe-inspiring, numinous monuments.[57] Deir el-Medina's position in this landscape and its tangible materiality ensured that it became imbued with layered religious, ritual and funerary meanings. As the Greek designation suggests, Deir el-Medina should not be considered as an isolated entity, since it was part of the panorama of Thebes in which the East and West Banks were linked by a series of events, such as the various river crossings of the cult image of Amun.

The concatenation of data—archaeological, textual, iconographic, and artefactual—relating to Deir el-Medina in Ptolemaic and Roman times show that the site was far from deserted; in fact, as Valbelle has noted, 'c'est à l'Époque Gréco-romaine que le site reprit

[54] K. Vandorpe, 'City of Many a Gate, Harbour for Many a Rebel', in Vleeming, *Hundred-Gated Thebes*, 230.

[55] B. Bruyère, *Rapport sur les fouilles de Deir el Médineh (1948–1951)*, 19–30.

[56] See Wilfong, *BASP* 26, 145.

[57] The same kind of sentiments are expressed by the numerous Roman tourists who left poetic inscriptions recording their responses to the site on the feet of the Memnon statues. Representative is that of Caecilia Trebulla. In her poem, Memnon laments the damage that time and man have wrought upon him, concluding, 'but now the sounds I emit in my lamentations are inarticulate and unintelligible, the relics of my lost good fortune': A. and E. Bernand, *Les inscriptions grecques et latines du Colosse de Memnon* (Paris, 1960), no. 94.

un peu de vie'.[58] Deir el-Medina's significance was reflected by the continued religious and secular activities there: occupation, construction, commemoration, visitation, burial, in addition to temple and monastic life, all suggesting that a certain status was associated with the site. Hathor, 'the great goddess, mistress of the west', who assisted in the transitions between life, death and rebirth, presided over the temple and the necropolis, and it is hard to believe that this proximity to the goddess was irrelevant to the people who were buried there and their aspirations to attaining an afterlife. Demotic graffiti in the Deir el-Medina tombs, beginning with formulaic wishes like 'may your soul live for ever' (*ꜥnḫ pꜣy.t bꜣ nḥ*)[59] suggest how the tomb, and by extension the burial site, was closely linked with individual hopes of being reborn.

Furthermore, the symbolic status of Deir el-Medina was continually at issue, and the Hathor temple symbolised the containing and controlling of strife by the Ptolemies through the material display of their power. Spatial order in the sacred landscape may be associated directly with social order, and may be similarly linked to the shifting relations of politico-economic power and influence. Consider the public embarrassment for Graeco-Roman elites both locally and elsewhere if they failed to control the West Bank. This may well be what underlay Ptolemy V's interest in the re-establishment of Theban monuments while local unrest rendered him unable to control the temple of Edfu. In a sense, the landscape of Deir el-Medina and its environs took on a polyvalency; the overall aura of Deir el-Medina must have remained part of the local psyche, which the Ptolemies surely acknowledged in their building programme at the site, thus exploiting that monumentality. Monuments are a focused demonstration of social power and an expression of competing power strategies, so that the construction of the temple may have reinforced the status of both the rulers and the non-elite classes, through their investment of labour. Also one needs to consider the impact of specific numinous locales in the Egyptian landscape and their effect on human relations. To individuals in Graeco-Roman times, Deir el-Medina was imbued with this numen, and that spirit of place was transformed dramatically over the centuries that followed the demise of the workers' village at the end of the New Kingdom.

[58] D. Valbelle, 'Deir el-Medineh', *LÄ* I, 1031.
[59] See Spiegelberg, *Demotica* II, 14–17.

1. Masks from tomb 1407/C3. Pebos (coffin 2) and Krates also called Pebos (coffin 5) from tomb 1407/C3 at Deir el-Medina
(*Reproduced by courtesy of the IFAO, Cairo*)

2. Roman graffito of Heron from the temple of Hathor at Deir el-Medina
(*authors' photograph*)

MORTUARY ARCHAEOLOGY AND RELIGIOUS LANDSCAPE
AT GRAECO-ROMAN DEIR EL-MEDINA (pp. 179–97)

URBANISM AND THE URBAN COMMUNITY IN ROMAN EGYPT*

By RICHARD *and* ROBERT D. ALSTON

Urbanism in the ancient world has been of abiding interest to ancient social and economic historians, but very little is known about the populations of cities. The nature of the papyrological material is such that certain features of communities can be assessed and quantified. We concentrate on the issue of population, considering both the number of people living in the various types of settlements and occupational structures. The results demonstrate essential differences between urban and rural settlements. The final section considers segmentation of the urban community itself. Through analysis of the residence patterns of members of particular social groups, we show that the city displayed a certain amount of social zoning and suggest that the fundamental social division in the city was between the elite and the rest of the population.

Urban and rural populations: defining the city

STUDIES of the ancient world have tended to define ancient cities according to two separate but related sets of criteria. For the Roman world, the problem initially seems simple: cities were legally defined. Urban status was granted by the Roman authorities and involved a certain level of local autonomy and constitutional development. This legalistic definition led to the assumption that there were only three cities in Egypt until *c.* AD 200, though more recent work has shown the weaknesses of this view.[1] A second set of criteria emphasises urban functions. Pausanias' famous slighting description of Panopeus (10.4. 1) suggests a rather similar antique view.[2] This latter approach appears somewhat analogous to functional analyses of settlements adopted by certain modern geographical theories, such as Christaller's 'central place' analysis and derived schools of thought,[3] but, given the available archaeological and documentary material, the facilities taken as signifying the status of the settlement are often necessarily limited and

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[1] A. H. M. Jones, *The Cities of the Eastern Roman Provinces* (Oxford, 1937), 329; A. K. Bowman, *The Town Councils of Roman Egypt* (ASP 11; Toronto, 1971), 18; D. W. Rathbone and A. K. Bowman, 'Cities and Administration in Roman Egypt', *JRS* 82 (1992), 107–27. The legalistic approach has also affected more sociological approaches to the ancient city: M. I. Finley, *The Ancient Economy* (London, 1985), 204, dismissed the evidence from Oxyrhynchus relating to the third-century corn dole by writing that 'I still prefer to judge the mentality of the later emperors from the practice of Constantinpole ... rather than what might have been done for a few years by the insignificant Egyptian village of Oxyrhynchus.'

[2] Arguably, since Panopeus was classed as a *polis*, this criterion was only a minor factor in ancient categorization.

[3] W. Christaller, *Central Places in Southern Germany* (trans. C. W. Baskin) (Englewood Cliffs, NJ, 1966). J. Beaujeu-Garnier and A. Delobez, *Geography of Marketing* (London and New York, 1979), 111–12, summarise the critique of Christaller's theories but note (pp. 140–1) the remarkable correlation between population and number of retail outlets.

related to the legal and administrative status of the community. In practice, therefore, such analyses differ fundamentally from the much more wide-ranging and complete surveys favoured by these modern schools. This legalistic approach is in marked contrast to discussions of modern urbanism which tend to emphasise socio-economic features. Although the granting of urban status concentrated administrative and political functions, which may have had long term effects, the economic and social implications of such an urban status are obscure. The legal status of a settlement could be changed at the whim of the Roman administration, converting villages into cities and cities into villages, and such a transformation is unlikely to have immediately altered the socio-economic nature of a settlement. Unless one were to argue that ancient urban communities were distinguished from villages in only their legal and administrative status and the socio-economic results of that status, it is likely that the correlation between cities defined by socio-economic criteria and those defined by constitutional criteria would be imperfect.

The most obvious socio-economic criteria for defining an urban settlement relate to population. A city may be defined as being a settlement with a large and concentrated population. The exact boundaries of such a definition are, of course, open to considerable debate and the subsequent level of disagreement is at least one reason why some have sought other, more complex definitions.[4] In this paper, 'large' is treated as a relative, not an absolute, value, being relational to the other settlements in the locale or settlement system.[5] A third criterion relates to the nature of the population: the occupational structure. One would expect a village to have a high proportion of its population engaged in agricultural activities, while craftsmen and merchants would be more numerous and varied in occupation in the cities. Ancient historians have not, however, found population size and density useful criteria since we have very few adequate population figures for ancient settlements outside Egypt.[6]

One can estimate the population of five *metropoleis* in different periods (Table 1). In AD 199, six *eutheniarchs* from Oxyrhynchus contracted each to equip bakeries sufficient to process twenty *artabai* of grain a day, suggesting a daily production of 120 *artabai* and a monthly production of 3,600 *artabai*.[7] Since the attested rate for the corn dole was one *artaba* per month, the number of recipients of the grain, whether as a dole or as

[4] L. de Ligt, 'Demand, Supply, Distribution: the Roman peasantry between town and countryside: rural monetization and peasant demand', *MBAH* 9 (1990), 24–56, suggests that towns may be defined by differences in population and occupational structure; a settlement should not be defined as a town when its population is much below 2,000, nor when over 50% of its inhabitants are engaged in agricultural production. J. V. Marshall, *The Structure of Urban Systems* (Toronto, 1989), 4, notes that the USA operates a formal lower threshold for an urban settlement of 2,500 people while Canada uses 1,000. M. A. Levi, *La città antica* (Rome, 1989), 34, offers six criteria to which a settlement should conform before it can be classed as a city: 1) single topographic unit; 2) number of inhabitants above a certain number (1,000); 3) labour and social differentiation; 4) variety of workshops by type and volume; 5) manner of life; 6) central point in respect to a territory. R. Hodges, *Dark Age Economics: The Origins of Towns and Trade AD 600–1000* (London, 1989), 20–5, summarises the various criteria offered for defining a town.

[5] Marshall, *Structure of Urban Systems*.

[6] R. P. Duncan Jones, *The Economy of the Roman Empire* (Cambridge, 1974) 259–87, demonstrates that the ancient figures used to establish populations of cities are often extremely problematic in themselves and the procedures necessary to convert the material into estimates of total population are such that there is a huge potential for error. His estimates suggest considerable ranges in population size, from 1,000 to about 300,000, and density, from 76 persons per hectare to 326 persons per hectare.

[7] *P.Oxy.* VI 908.

subsidised supply, would be 3,600. The corn dole was later available to male inhabitants of the *metropolis* over the age of twenty, although we cannot know whether it was available to all the male citizens or inhabitants of the *metropolis* at this date.[8] This would suggest a total population of at least 11,901.

The corn dole archive of AD 270–272 contains two registers.[9] These show that there were three groups of recipients for the corn dole. The major group, known as the 3,000 (presumably the *numerus clausus* for the foundation) numbered 2,928. The other two groups, presumably those who did not qualify as members of the 3,000 but were thought worthy for some reason also to receive the dole, numbered 728. Since registration in one of the metropolitan districts (*amphoda*) was required to qualify, it seems likely that most recipients would have dwelt in the *metropolis*. There would have been an unspecified number of men living in the city who would not have qualified in any of the categories. The failure of the eligible population to reach the *numerus clausus* might suggest that there was little pressure on the foundation and access to the list might have been comparatively easy. The missing male urban population cannot, however, be reasonably estimated and the resultant population figure of 12,087 must remain a minimum.

The best remaining figure for metropolite population derives from *Stud. Pal. Pap.* IV pp. 58-83. This papyrus contains a summary of the adult male population of one unknown *amphodon* of Ptolemais Euergetis and a detailed listing of the population of another district, Apolloniou Parembole. Apolloniou Parembole contained 179 adult males and the unknown *amphodon* had 385. Since there were about 33 *amphoda* in Ptolemais Euergetis in the Roman Period, the population can be estimated at 27,071.[10] If we were to treat the figure for the larger *amphodon* as unrepresentative, we could estimate a total population of 17,500. Conversely a high estimate would be about 36,500.

Other figures for the populations of metropolitan centres are derived from the number of houses in the city. These figures are, however, problematic since although the number of houses in a particular centre can often be estimated with some confidence, the multiplier necessary to produce an estimate of the total population cannot. At any one time, a considerable proportion of the housing stock may have been empty.[11] The phenomenon of houses shared between different domestic or familial units means that the number of occupants per house is difficult to estimate. A figure of 7.7 persons per house seems a reasonable estimate, and, allowing for 10% of houses being empty (a generous figure), the multiple to be used to convert number of houses into population is 6.9.[12]

A survey of the northern sector of the *amphodon* of Hermaion in Oxyrhynchus (*P.Oslo.*

[8] *P.Oxy.* XL, p. 6; 2892, 2893, 2894, 2895. To calculate total population a multiple of 3.306 is used. The figure is derived from R. S. Bagnall and B. W. Frier, *The Demography of Roman Egypt* (Cambridge, 1994), 104, table 5.4.

[9] *P.Oxy.* XL 2928; 2929.

[10] S. Daris, 'I quarteri di Arsinoe in età romana' *Aegyptus* 61 (1981) 143–54, lists the attestations of districts. The fifth and sixth century references suggest a reform or even an abandonment of the district divisions of the first to the fourth centuries.

[11] *P.Oslo.* III 111 suggests that 50% of houses in the particular district of Oxyrhynchus surveyed were unoccupied in AD 220/30. *P.Berl. Bork.*, however, suggests that only 5% of houses in the surveyed district of Panopolis were empty in *c.* AD 300.

[12] This figure is derived from R. Alston, 'Houses and Households in Roman Egypt', in A. Wallace-Hadrill and R. Laurence (eds), *Domestic Space in the Roman World* (*JRA* Suppl., 1997), 25–39), but the evidence from which this figure is derived comes mainly from *komai* and from a fairly restricted chronological period.

III 111) lists fifty houses. This would suggest 200 for the *amphodon* and, at 28–30 districts, about 5,500 houses for the city, giving a population of about 37,950. In fact, approximately 50% of the houses listed in this survey were empty, presumably an abnormal state, which would suggest a population close to 21,000.[13] *Stud. Pal. Pap.* V 101

TABLE 1. *Estimated populations of Egyptian settlements*[1]

A. *Metropoleis*

Metropolis	Document	Date (AD)	Estimated population
Hermopolis Magna	*Stud. Pal. Pap.* V 101	*c.* 275	58,429
Ptolemais Euergetis	*Stud. Pal. Pap.* IV, pp. 58–83	72/3	27,071
Thmouis	*PSI* III 230	II c.	24,564
Oxyrhynchus	*P.Oslo.* III 111	235	21,000
Oxyrhynchus	*P.Oxy.* XL 2892–5	270–2	12,087
Oxyrhynchus	*P.Oxy.* VI 908	199	11,901
Apollonospolis Heptakomias	*Archiv* VI 427	116	8,784

B. *Komai*[2]

Kome	Name	Date (AD)	Population
Narmouthis	Arsinoite	II c.	6,106
Karanis[3]	Arsinoite	*c.* 150	3,316
Philadelphia	Arsinoite	48–9	2,848
Philadelphia	Arsinoite	50–1	2,637
Philadelphia	Arsinoite	32–3	2,502–2,851
Theadelphia	Arsinoite	mid II c.	2,300
Karanis	Arsinoite	*c.* 172	1,907–2,135
Psenathre	Mendesian	131–2	928
Soknopaiou Nesos	Arsinoite	178	760
Soknopaiou Nesos	Arsinoite	179	520
Nemeo	Mendesian	159/60	436
Soknopaiou Nesos	Arsinoite	207–9	420
Unknown village	Mendesian	159–60	372
Psenathre	Mendesian	159–60	247–259
Psen[ ]	Mendesian	159–60	163
Damastu	Mendesian	159–60	157
Psenokaia	Mendesian	159–60	79

[1]The legal distinction between *metropoleis* (settlements identified by the Roman authorities as the administrative centres of the nomes and whose inhabitants were granted certain privileges) and *komai* (settlements of a lesser legal status) has been preserved in this table since the population estimates for *metropoleis* are derived from D. W. Rathbone, 'Villages, Land and Population in Graeco-Roman Egypt', *PCPhS* 36 (1990), 103–42, with modifications.

[2]The figures are derived from Rathbone's number of men attested in the village but using by Bagnall and Frier's multiplier to calculate total population; Bagnall and Frier, *The Demography of Roman Egypt*, 103, n. 35.

[3]Population figures for Karanis come from R. Alston, *Soldier and Society in Roman Egypt: A Social History* (London and New York, 1995), 121.

[13]The Hermaion is a comparatively well attested *amphodon* and the figures from Ptolemais Euergetis suggest that there could be considerable variation in sizes of *amphoda*. It seems very likely that I have considerably over-estimated the number of houses for the city.

of the late third century AD gives the number of houses in each of the four *amphoda* of Hermopolis. The totals, 2,317 and 1,917 houses, are preserved for only two of the *amphoda*. We estimate a total number of houses of 8,468 and a total population of 58,429. The twentieth *amphodon* of Thmouis had 178 houses, which suggests a minimum of 3,560 houses in the *metropolis* and a population of 24,564.[14] A complete summary register of houses at Apollonospolis Heptakomias in Middle Egypt dating from AD 116 shows 1,273 houses, which suggests a population of 8,784.[15]

An imperfect measure of housing density can be derived from the numerous house sale documents. These locate the property in reference to the neighbouring plots, which are frequently described in some detail. Since one side of the house would be used for access, a house could have neighbouring houses on three sides. These descriptions can be used to create an index of housing density, though obviously we have no data for the area of particular houses and so it remains an imperfect measure. This suggests that 2.73 of the three available plots were used for other houses.[16] There is insufficient archaeological evidence with which to test such a figure but other documentary evidence, notably the surveys of property in *P.Oslo.* III 111 and *P.Berl. Bork.*, also suggest a very dense pattern of settlement.

It is sufficient to reproduce the conclusions of Rathbone's discussion of the limited available evidence for the population of *komai* with slight modifications.[17] Crude averages produce mean populations of about 1,500 and medians of around 650. The attested range of populations is, however, huge. A similar range of *kome* sizes can, however, be postulated for the Oxyrhynchite nome. *P.Oxy.* XXIV 2422 and *P.Oxy.* X 1285 attest tax payments made by Oxyrhynchite *komai* and the levels of these payments are most likely in proportion to the size of the settlements. Since the total area of land of the Oxyrhynchite nome can be estimated with a reasonable degree of confidence, these texts can be used to estimate the absolute size of territories.[18] It seems likely that the largest Oxyrhynchite *komai* were of approximately the same size as Karanis, which was, in turn, probably one of the largest Arsinoite *komai*.[19] The available figures suggest a population figure for *settlements* of this type of about 2,000–3,500. The population figure for

[14] *PSI* III 230.Thmouis was a Ptolemaic foundation and was situated 1.5 km south of the old Pharaonic centre of the nome, Mendes. See E. Naville, 'Excavations. Prof. Naville's work of the winter 1892', *EEF Archaeological Report 1892–1893*, 1–8; D. P. Hansen et al., 'Mendes 1965 and 1966', *JARCE* 6 (1967), 1–52. It seems likely that both sites were occupied simultaneously and that they together formed a single urban centre. Mendes itself had at least nine *amphoda*; see *P. Thmouis* I 93, although few remains on the site can be dated later than the fourth century BC.

[15] *Archiv.* VI 427 = *P.Brem.* 21 + *P.Flor.* 333. The numbers of houses in each quarter are remarkably consistent.

[16] The figure is based on analysis of 71 neighbouring plots. We compared the possible attested number of available plots and the number of neighbouring houses. The method allows partially-preserved descriptions to be used. The index suggests that houses were in blocks of sixteen houses arranged in two rows.

[17] Rathbone, *PCPhS* 36, 103–42. These figures can only be used as rough guidelines to the size of *komai* and the figures themselves, derived from two nomes, one of which was undergoing considerable demographic strain in the period, may be untypical.

[18] The figures are derived from comparison of village contributions in these documents in combination with a third-century figure for the available grain land in the Oxyrhynchite nome; R. S. Bagnall and K. A. Worp, 'Grainland in the Oxyrhynchite nome', *ZPE* 37 (1980), 263–4. This would suggest that Rathbone's 'benchmark figure' of 1,000 for the population of an average *kome* is a little high.

[19] For the purposes of this comparison, we assume that population varied according to area of land under cultivation.

Narmouthis is significantly above this.[20] There appears to be another group of settlements with populations of under 1,000 but the effects of demographic changes in the late second century AD and the paucity of figures mean that further distinctions are difficult to draw. I think it safe to assume from the Oxyrhynchite evidence and from the number of settlements attested in other regions that there would have been numerous settlements with populations significantly below 500.

The population density for *komai* is impossible to estimate accurately. Environmental constraints and the nature of Egyptian agriculture, with settlements located either on natural rises known as 'turtle-backs' or defended from the flood waters by dykes and with good agricultural land in great demand, discouraged a dispersed pattern of settlement. The plans of Karanis showing comparatively small houses in *insulae* linked by streets and alleys in an intricate network suggest a population tightly packed into a highly nucleated settlement.[21] Density of settlement in *komai* can be estimated using the same statistical measure as for *metropoleis*. Using a larger available sample of attested neighbouring plots, we calculate that 2.33 of the three available plots were occupied by other houses.[22] This high figure for housing density confirms the impression gained from the Karanis excavations.[23]

These figures provide the fundamental grounds for the categorisation of settlements. All the settlements examined were nucleated and of high housing density. The population estimates for Ptolemais Euergetis, Oxyrhynchus and Thmouis suggest that these centres had populations far higher than the other settlements in their districts. Hermopolis Magna seems so large that we must presume that it too was the largest settlement in the locality.[24] However, in terms of the 'urban system' of the province as a whole, Alexandria was significantly larger.[25] We can distinguish by population size first rank settlements (Alexandria), second rank settlements (Ptolemais Euergetis, Hermopolis Magna, Thmouis, Oxyrhynchus, and so on) and third rank settlements (Karanis, Philadelphia, Theadelphia, and so on), but we need to establish whether the boundary between urban and rural settlements should be placed between first and second rank settlements, second and third rank settlements, or at some other point.[26] It is only when

[20] The papyrus, *P.Berl.* inv. 16011, on which this figure appears, is lost and so the reading cannot be checked. See Rathbone, *PCPhS* 36, 132.

[21] E. M. Husselman, *Karanis: Excavations of the University of Michigan in Egypt 1928–1935: Topography and Architecture* (Kelsey Museum of Archaeology Studies 5; Ann Arbor, 1979), maps 9–23.

[22] This figure is based on analysis of 199 attested neighbouring plots. Most of the attested neighbouring plots (178) come from Fayum *komai* which produce an index figure of 2.36. This suggests typical blocks of six houses, arranged in two rows. The difference in housing densities of *metropoleis* and *komai* is statistically significant.

[23] Throughout this analysis, we are forced to rely mainly on the papyrological material. Few sites have been excavated as completely as Karanis and the excavation of Roman periods of both urban and rural sites has tended to concentrate on monumental architecture. Even a site as comparatively fully excavated as Karanis presents considerable problems of interpretation (see Alston, *Soldier and Society*, 118–23). As with other provinces of the empire, the archaeological evidence in itself cannot be used to establish the demographics of settlements. The size of the surviving mound may be a crude guide to the size of the ancient site, yet issues such as density and chronology of occupation make its use problematic. Our method, then, has been to use the available papyrological evidence and seek (on those rare occasions when it is possible) archaeological confirmation.

[24] Hadrian built Antinoopolis almost directly across the river from Hermopolis but although Antinoopolis appears to have been a large and populous settlement, its construction did not obviously affect the prosperity of Hermopolis.

[25] The population of Alexandria is normally estimated to be somewhat more than 300,000.

[26] Marshall, *Structure of Urban Systems*, 18, notes that within a settlement system, the ratio of populations of settlements in different orders—hamlet, village, town, city—is normally in a ratio of 1:3.

we turn to our third criterion that the fundamental difference between second and third rank settlements becomes clearer.

The best figures for the proportion of the male population engaged in trades are given in Table 2.[27] The samples in our two texts from Oxyrhynchus are extremely small. Combining the samples suggests that tradesemen comprised about 28% of the male population, very close to the figure from Panopolis. The next group comprises figures from Tebtunis and Theadelphia.[28] Both samples are comparatively large. A third group comprises Soknopaiou Nesos, Philadelphia, Karanis and the Herakleopolite settle-

TABLE 2. *Percentage of tradesmen as a proportion of the total male population*

Text	Provenance	Date[1]	Number of tradesmen	Number of men	Other information	Percentage of tradesmen
P.Oxy. XLIV 3300	Oxyrhynchus	*c.* 270	10	24		41.7
P.Berl. Bork.	Panopolis	298–300	111	410		27.1
P.Oslo. III 111	Oxyrhynchus	235	4	26	House owners and some residents	15.4
BGU IX 1898	Theadelphia	172	19	136	Tax receipts	14.0
SB I 5124	Tebtunis	192	46	337		13.6
P.Corn. 22[2]	Philadelphia	I c.	26	114	Resident aliens	7.3
P.Corn. 21			16	360		
P.Oxy. XXIV 2412[3]	Herakleopolite nome	28–9	5	73		6.8
			10	143		7.0
P.Mich. IV 223–5	Karanis	172–5	41–43	*c.* 700		5.9–6.1
SB XIV 11715	Soknopaiou Nesos	207–9	8	135		5.9

[1] All dates AD unless stated.

[2] These texts are of approximately the same date and have been combined for the purposes of this calculation.

[3] The text lists tax payers at a number of sites over several years. These tax payers may simply be aggregated or one may attempt to use the fullest entry for each settlement. There is little reason to believe that the irregularities of the text affect the rate of attestation of tradesmen.

[27] There are other potentially useful texts but these provide unrepresentative samples of the population of the particular settlements. *P.Oslo.* III 144 is a register of those contributing to a particular religious cult at Oxyrhynchus, but it seems likely that the contributors are not a representative sample of the population. *P.Corn.* 23 from Philadelphia registers 88 weavers as part of a group of 248 men, who may be those who paid the trade tax. The text is from the same archive as *P.Corn.* 21 and 22 from Philadelphia. Given that the total male population of the village was 800–900, *P.Corn.* 23 suggests a considerably higher proportion of tradesmen in the population than our other texts, which attest about 40% of the male population. It seems possible that *P.Corn.* 23 relates to an area wider than or different from that of the village. *P.Col.* VIII 230 from Karanis lists men of a certain financial standing and cannot, therefore, be considered representative. *P.Landl.* list only those who owned land in certain areas of the Hermopolite nome. The 5% of the population who were tradesmen at Ptolemais Euergetis (*Stud. Pal. Pap.* IV, pp.58–83) represents only potters and wool carders.

[28] *BGU* IX 1898 is a list of payments made to the *sitologoi* of the village. It is possible that this group was not representative of the general population.

ments.[29] The difference between the first and the third group is marked. As with the population, there is an obvious distinction between the *metropoleis* and the *komai*.

Our evidence for the range of trades performed in various settlements is far from complete and the attestation of a particular type of tradesman at a particular settlement does not imply that many or most settlements of that type would have had such a tradesman. Although the types of tradesmen attested in *metropoleis* and *komai* are quite similar, it is possible to discern some trades which appear to be wholly or mainly metropolitan. These include the bleachers, the pitch-workers, the *oinemperoi* (a type of wine merchant, possibly selling a wide range of wines), the dyers, the linen weavers, the bakers, the silversmiths, the *entaphistai* (a group of necropolis workers), the glass makers (although there are very few attestations of these craftsmen) and the sailors. Predominantly non-metropolitan trades include oil workers, vegetable-sellers and donkey drivers. Weavers are attested in all types of settlement, though appear less regularly in *metropoleis*.[30] The absence from smaller settlements of glass manufacturing and *oinemperoi* may be of only limited significance, especially since the precise differences, if any, between *oinopolai*, *oinopratai* and *oinemperoi* are obscure, and two of these three categories of wine merchant appear to have been active in all contexts. Nevertheless, the distribution of attestations suggests some socio-economic features of the different communities. The number of references to bakers in *metropoleis*, which is partly a result of official interest in their activities, may reflect a tendency of the metropolitan population to buy their bread, or receive it as dole, rather than bake it themselves, in contrast to the predominance of domestic production in more agricultural settlements. Clearly cloth was produced in all types of settlement, but the distribution of attestations of linen weaving and cloth-finishing trades suggests that production and probably the sale of the higher qualities of cloth was concentrated in the *metropoleis*.

Karanis, the best attested of our third rank settlements, provides very little evidence for extensive or long distance trade.[31] Mediterranean goods did arrive in Karanis but non-Egyptian pottery comprises only a very small percentage of the pottery recovered from the site. A considerable number of coins were found during excavation and the papyri provide ample evidence for the workings of a monetarised economy. It seems probable that only the most basic of goods, foodstuffs, coarse cloth and a few other items would have been exchanged within the community or with the immediately neighbouring sites, and that these would also have been the main goods exchanged for higher status goods at the local markets, probably in Ptolemais Euergetis or possibly in Memphis.[32] In contrast, a survey of the Oxyrhynchus papyri shows that the population maintained extensive contacts with the *komai* of the Oxyrhynchite nome, and also with communities

[29] A comparison can be drawn with the seventh-century settlement of Aphrodito. Although called Aphroditopolis in the documentation, the evidence suggests a comparatively small community. *P.Hamb.* I 56 gives the total tax contribution from Aphrodito. The proportion derived from trades was 5.8–6.6%.

[30] Most references to weavers in *metropoleis* are from the first century AD.

[31] Alston, *Soldier and Society*, 118–23.

[32] There are alternatives to reliance on the urban market for these goods. The Yoruba used rural markets, whose positioning was unrelated to the pattern of settlement hierarchy (B. W. Hodder, 'The Yoruba Rural Market', in P. Bohannan and G. Dalton (eds), *Markets in Africa* (Evanston, IL, 1962), 103–17), or relied on travelling pedlars, who were common throughout Europe in the Medieval and Early Modern Periods. Rural fairs could also provide villages with opportunities to sell or to purchase fine cloth or other 'non-essentials'. There is, however, very little evidence for the existence of these types of markets in Roman Egypt; see R. Alston, 'Trade and the City in Roman Egypt', in H. Parkins and C. Smith (eds), *Trade, Traders and the Ancient City* (forthcoming).

further afield. The evidence cannot be translated into anything approaching trade statistics but is suggestive of a trade network extending far beyond the boundaries of the nome.[33] Oxyrhynchus seems to have been at the centre of the trade network for the nome and an important part of a wider trade network.

The second rank settlements fulfil both our primary and secondary criteria for urban settlements. They have been shown to have been settlements of large populations and high population densities. They had a significant proportion of the population engaged in non-agricultural activity and were probably at the centre of extensive trade networks. These settlements can safely be described as urban. Our third rank settlements cannot be described as urban. These were significantly smaller than the second rank settlements, although nucleated and with what seem to have been quite large populations, only a very small proportion of which were engaged in non-agricultural activities. They may be described as villages. A third group of settlements presents greater difficulties. Tebtunis and Theadelphia appear to have had a larger number of traders in the community than the third rank settlements, but we have no clue as to their population. Narmouthis, on the other hand, may have had a significantly higher population than the third rank settlements but we have no evidence for the proportion of traders in the population. We shall return to this group once we have considered other differences between urban and rural communities, involving household and family structure and domestic architecture.

All types of family structure are attested in both urban and rural settlements and urban families could be both extended and very large. In cities, households were normally simple in form, units comprised of a single individual, or of siblings, or of the conjugal family being most common. Extended family and multiple family households were more common in villages. This must have been influenced by economic factors. Partible inheritance and intensive agricultural exploitation may have favoured the pooling of resources, the most important being land and labour, in more complex household structures, while the more varied economies of the cities allowed families to diversify interests. Children and siblings could form separate households without seriously affecting the economic prosperity of the extended family. In spite of the greater complexity of rural household structures, the average size of families of all household types is only slightly higher in villages (4.46 people) than in cities (4.04), but the average size of households (families, lodgers and slaves) was higher in the cities (5.31 people) than in the villages (4.82), in part due to the far higher proportion of slaves in urban households.[34] Any loss of labour due to the division of the extended family would be compensated for by the use of slaves, which in itself suggests the greater wealth of urban communities.

Household structures may be suggestive of emotional ties and the smaller number of households comprised of extended families in cities may reflect the lesser significance of the extended family as a social unit. The correlation between household and co-resident family and those any individual regarded as 'family' is not, however, perfect since the extended family could still be important even when the household was comprised of only a conjugal family unit. When discussing residence patterns below, we

[33] Ibid.

[34] All the data is derived from Bagnall and Frier, *Demography of Roman Egypt*, 66–71.

shall present evidence to suggest that the extended family continued to be important for high status urban groups.

Greater economic prosperity is also reflected in the differential between urban and rural house prices. In the second century AD, the average village house sold for 40–60% of the price of an urban house. The differential was similar in the first century, although may have reduced slightly in the third (see fig. 1).[35] Marked differentials in house prices

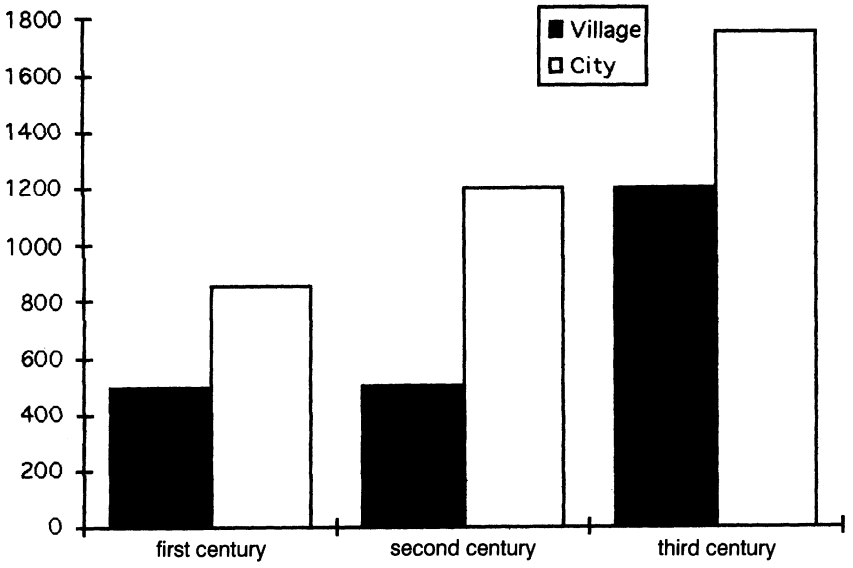


FIG. 1. *Median prices of houses in villages and cities by century in drachmas.*[36]

between areas is, of course, a familiar modern phenomenon and can be explained by related economic factors such as the availability and costs of building land, the level of demand for housing (a particularly important factor when a settlement's population is expanding at a rate disproportionate to that of its neighbours), and the willingness and ability of the purchasers to pay higher prices to reside in a particular place. These factors are either unlikely to have applied or cannot be shown to have exerted a major influence over house prices in Roman Egypt. The price differential can be adequately explained by the notable architectural differences between urban and rural houses (see below).

The descriptions of houses preserved in the documentation are fairly scanty but the number of storeys is frequently mentioned and Husson collected the references to produce an equivalent table to Table 3.[37]

Table 3 shows conclusively that while two and three storey houses were the norm in villages, single storey houses and houses of four or more storeys were far more common

[35] The second-century figures are based on comparison of 11 urban and 22 village prices. See Alston, in Wallace-Hadrill and Laurence, *Domestic Space in the Roman World*, 25–39, esp. 31–3.

[36] Analysis by medians is the best statistical method to avoid distortions caused by one or two extreme prices. The graphs of means would be quite similar (see Alston, in Wallace-Hadrill and Laurence, *Domestic Space in the Roman World*, 25–39, esp. 32–3), and the data is unsuitable for analysis by mode.

[37] G. Husson, *Oikia. Le vocabulaire de la maison privée en Égypte d'après les papyrus grecs* (Paris, 1983), s.v. στέγη. Inadequate preservation and the lack of systematic excavation of urban and rural housing make it impossible to use the archaeological evidence as a basis for comparison of urban and rural housing stock.

TABLE 3. *Houses by number of storeys*

Settlement type	Number of houses by storey						
	1	2	3	4	5	6	7
Villages	11	26	14				
Cities	14	9	11	4			1

in the cities.[38] Although some single storey housing may have been of poor quality, this pattern is likely to reflect a more luxurious use of space in urban houses while four-storey houses reflect rather different economic pressures.

The *aithrion*, a central internal, integral court, features more commonly in urban houses.[39] There are about 130 occurrences of the term in papyri, 75 of which relate to urban houses. Less than 40 relate to non-urban houses, the majority of these (26) being in Tebtunis.[40] The *oikia dipurgia* (the two-towered house), the towers probably being attached to the gatehouse, shows a similar pattern of distribution. I have found fifteen certain references to the feature.[41] Nine of these relate to urban houses, three relate to village houses, and three are of uncertain provenance. Of the village references, *P.Oxy.* XIV 1703 relates to a house in the village of Seryphis in the Oxyrhynchite nome, a contract for the sale of which was exchanged by two former magistrates of Oxyrhynchus. *PSI* X 1159 from Tebtunis lists the house as part of a substantial estate of $132\frac{3}{4}$ *arourai*.[42]

Although it seems that there was no absolute distinction between urban and rural housing since all the features discussed can be found in all types of settlement and some of the urban house prices are as low as those in the villages, the cities contained a number of high status houses. The difference in mix of houses probably reflects a tendency on the part of the wealthier elements of Egyptian society to reside in the cities. This social mix, with its contrast to village society, would have been obvious to all, reflected as it was in the domestic architecture of the city. In Roman Egypt, as elsewhere in the ancient world, the city was home to at least some of the elite.

We have in this section established several fundamental differences between urban and rural settlements and shown that the boundary between city and village falls between our second and third rank settlements. It may be noted that all our urban settlements are

[38] If the housing stocks were similar, the chance of this level of variation between attested numbers of storeys in urban and rural settlements having arisen due to the random process by which documents were preserved is only 1.2%.

[39] For a discussion of the *aithrion* see Alston, in Wallace-Hadrill and Laurence, *Domestic Space in the Roman World*, 25–39, esp. 29–31.

[40] Estimating from preserved house prices and attestations of the number of storeys, we would expect an evenly-distributed feature to appear 20–30% more often in villages than in cities.

[41] Husson, *Oikia*, s.v. πύργος, to which add *BGU* XIII 2239 and *P.Wash. Univ.* I 15.

[42] *BGU* XIII 2239 refers to a *dipurgia* but makes no mention of a house, suggesting rather a different type of structure.

metropoleis and our villages *komai*. We have, however, identified certain discrepant communities, those of Tebtunis, Theadelphia and Narmouthis. In addition to the high proportion of tradesmen at Tebtunis, there was a high incidence of those architectural features which can be associated with elite housing. Although we have no grounds for estimating population, it was probably one of the more substantial settlements of the Fayum. It seems that Tebtunis showed urban characteristics, though these are insufficient for us to classify it as second rank settlement. The Fayum was a particularly large and prosperous nome and it is possible that some of the settlements of the south-east came to act as secondary central places within the nome, fulfilling some of the functions of the local city. This can be supported by examining the role of the temples in these settlements. In Pharaonic, Ptolemaic and early Roman Egypt, the temples were the major institutions of most settlements. The role of the temple is illustrated by Thompson's account of Ptolemaic Memphis[43] and we would expect there to be a correlation between an urban centre and the location of important religious institutions. The temples at both Narmouthis and Tebtunis were large Pharaonic foundations.[44] The Narmouthis temple had institutional links to the temples in the surrounding villages and there is some evidence that the Tebtunis temple played a similar role.[45] The Tebtunis temple also managed to retain a demotic scribal school into the Roman Period and was probably a significant centre of traditional Egyptian religious learning.[46] It seems probable that the centrality of the temples reflected the economic relationship between these centres and the surrounding villages. Changing economic circumstances and the geographical complexity of even such a comparatively simple region as Egypt means that there will always be settlements which do not fit easily into a particular category. In Upper Egypt, some traditional religious and administrative centres were probably not significant centres of population in the early Roman Period. Diospolis, on the site of ancient Thebes, was the centre of nome administration in 5 BC, probably in accordance with a long established tradition, but there were several competing centres and it was later replaced by Hermonthis.[47] Diospolis itself was perhaps a cluster of villages and, in spite of its legal status, it seems unlikely that the settlement was an urban centre.[48]

We have shown that one of the characteristics of cities was the heterogeneity of their populations in terms of both occupation and economic status and that this would have been obvious to all since it was reflected in the architecture of the city. In the next section

[43] D. J. Thompson, *Memphis under the Ptolemies* (Princeton, 1988), 80–1.

[44] G. Bagnani, 'Gli scavi di Tebtunis', *Aegyptus* 14 (1934), 3–13; A. Vogliano, 'Rapporto preliminare della IVa campagna di scavo a Madînet Mâdi', *ASAE* 38 (1938), 533–59; A. Vogliano (ed.), *Primo rapporto degli scavi condotti dalla missione archeologica d'Egitto della R. Università di Milano nella zona di Madinet Madi (Campagna inverno e primavera 1935–XIII)* (Milan, 1936), 7; A. Vogliano (ed.), *Secondo rapporto degli scavi condotti dalla missione archeologica d'Egitto della R. Università di Milano nella zona di Madinet Madi (Campagna inverno e primavera 1936–XIV)* (Milan, 1937), 1–57; A. Vogliano, *Un impressa archeologica milanese ai margini orientale del deserto libico* (Milan, 1942), 13–17.

[45] P. Gallo, 'The wandering personnel of the temple of Narmuthis in the Faiyum', in Janet H. Johnson (ed.), *Life in a Multicultural Society: Egypt from Cambyses to Constantine and Beyond* (SAOC 51; Chicago, 1992), 119–31. *P.Tebt.* II, pp. 54–6, discusses the role of the temple of Tebtunis.

[46] W. J. Tait, 'Demotic Literature and Egyptian Society', in Janet H. Johnson (ed.), *Life in a Multicultural Society*, 303–10, shows the continuation of the demotic tradition in Tebtunis. See also *P.Tebt. Tait.*

[47] *SB* I 2078; *SB* I 2079; *CIG* III 5077.

[48] *OGIS* II 654, but see Diodorus, I 45. A. Bataille, 'Thèbes gréco-romaine', *CdE* 26 (1951), 325–53, surveys the literary tradition concerning the site.

we consider whether this population formed a single community and trace the social divisions of the city by analysing patterns of residence.

Residence patterns

The distribution of population across a city reflects its social and political structures.[49] For instance, capitalistic cities tend to segregate residential districts by social class, a notable feature of many nineteenth-century British cities, and to concentrate retailing in a central business district.[50] Societies which emphasise particular ethnic or racial divisions or in which a particular ethnic group has religious or linguistic problems in integrating with the dominant culture or in which the ethnic group forms a primary support network, will tend to have cities which, formally or informally, display ethnic or racial segregatation. Sjoberg suggested that in the pre-industrial city the elite would be concentrated in areas close to the centre of the city, presuming that this was close to the centre of power.[51] Such a pattern suggests a very clear distinction between elite and ordinary people. An entirely different pattern may also be adopted by a powerful and distinct elite: in certain Renaissance Italian cities, and perhaps in certain Roman cities, the elite were spread fairly evenly across the town. Such a pattern might suggest a community without a strong central authority, but marked by competition between members of the elite who secured the cohesion of their faction using social devices such as patronage.[52] Medieval Islamic cities had carefully defined quarters which at times had their own markets. The organisational principles behind such divisions are, however, unclear.[53] A city with a fairly even distribution of both tradesmen and elite might also have largely independent neighbourhoods. Conversely, marked concentrations of particular trades would be compatible with a city with strong centralised authority (possibly powerful trade guilds, though some concentrations could occur through normal economic pressures).[54] Patterns of residence display the fissures within a community. In extreme cases, these are so great that a city becomes an agglomeration of hostile communities.

[49] D. T. Herbert and R. J. Johnson, 'An introduction: Spatial processes and forms', in D. T. Herbert and R. J. Johnson (eds), *Social Areas in Cities II—Spatial Processes and Forms* (London, 1976), 1–4, write that the 'urban landscape is a mirror reflecting the society which maintains it'.

[50] C. G. Pooley, 'Choice and constraint in the nineteenth-century city: a basis for residential differentiation', in James H. Johnson and C. G. Pooley (eds), *The Structure of Nineteenth Century Cities* (New York, 1982), 199–233.

[51] G. Sjoberg, *The Preindustrial City: Past and Present* (New York, 1965), 98.

[52] D. O. Hughes, 'Urban Growth and Family Structure in Medieval Genoa', in P. Abrams and E. A. Wrigley (eds), *Towns in Societies* (Cambridge, 1978), 105–30. The pattern is less clear in Roman cities but W. Jongman, *The Economy and Society of Pompeii* (Amsterdam, 1991), 289–311, and H. Mouritsen, *Elections, Magistrates, and Municipal Elites: Studies in Pompeian Epigraphy* (Analecta Romana Instituti Danici Suppl. 15; Rome, 1988), 67–8, point to the political importance of the support of localities. See also A. Wallace-Hadrill, *Houses and Society in Pompeii and Herculaneum* (Princeton, 1994), 77–8, and R. Laurence, *Roman Pompeii: Space and Society* (London and New York, 1994), 131–2.

[53] I. M. Lapidus, 'Muslim Cities and Islamic Societies', in I. M. Lapidus (ed.), *Middle Eastern Cities: A Symposium on Ancient, Islamic and Contemporary Middle Eastern Urbanism* (Berkeley and Los Angeles, 1969), 47–74. S. D. Goitein, 'Cairo: An Islamic City in the Light of the Geniza Documents', in Lapidus (ed.), *Middle Eastern Cities* 80–95, shows that the division was not ethnic in Cairo.

[54] Although often assumed, such a pattern seems to have been quite rare. See D. Denecke, 'Social status and the place of residence in preindustrial German towns: Recent studies in social topography', in Herbert and Johnson (eds), *Social Areas in Cities*, 125–40.

Egyptian cities were divided into districts known as *amphoda* or *laurai*. In the early Roman Period, these designations were used irregularly and the vocabulary varied.[55] After the second half of the first century AD, however, the *amphoda* were used systematically for official registrations of people and property. In Oxyrhynchus, Hermopolis Magna and Ptolemais Euergetis these *amphoda* were named and appear to have centred on pre-existing topographically distinct areas. In other cities, the *amphoda* were numbered, perhaps reflecting a regular urban morphology, as was clearly the case at Thmouis.[56] Many of the *amphoda* were given names derived from prominent topographical features, but ethnics and names derived from trades were common. Many of these names are of obscure origin and if the designation ever reflected the nature of the population of the district, these are likely to have been pre-Roman features.[57] Gooseherds, shepherds, Bithynians, Cretans and Lycian horsemen were prominent in the topographical descriptions of Oxyrhynchus and Ptolemais Euergetis, but not notable elements of the population, though the Jewish *amphodon* in Oxyrhynchus may have contained a concentration of Jewish residences and Jewish institutions.[58] On the whole, this evidence does not suggest concentrations of trade or ethnic groups in particular areas of the city.[59]

The preserved attestations of the magisterial and gymnasial elite in individual *amphoda* can be used to suggest the distribution of the elite across Oxyrhynchus, though the irregularities in the number of papyri mentioning each *amphodon*, in the types of documents preserved, and in the numbers of separate individuals associated with particular *amphoda* urge caution. The elite can be connected with many of the *amphoda* of the city. Of the sixteen comparatively well-documented *amphoda* (nine or more papyri), four appear to have unusually high numbers of elite attested, seven have a moderate number, and five appear to have either no or very few members of the elite.[60] The evidence does not suggest that the elite were particularly concentrated but that there were certain comparatively limited areas in which the elite did not reside and areas which had a marked concentration of elite residence.

A fuller picture can be gained from *P. Berl. Bork.*, an early fourth-century AD register of houses and residents from Panopolis in Upper Egypt. The main register has over 430 entries.[61] The individuals in the text were grouped according to trade and status

[55] J. Krüger, *Oxyrhynchos in der Kaiserzeit: Studien zur Topographie und Literaturrezeption* (Frankfurt am Main, 1990), gives the most recent list of the Oxyrhynchite *amphoda*, although the institution is more fully discussed by H. Rink, *Strassen- und Viertelnamen von Oxyrhynchos* (Giessen, 1924), 8–9. Daris, *Aegyptus* 61, 143–54, lists the *amphoda* of Ptolemais Euergetis and discusses the change from *laura* to *amphodon*.

[56] *P.Thmouis* I 91; 119; 142; 144–6; 160; *PSI* I 107; III 230–1. See n. 14.

[57] This is not to say that the divisions themselves did not retain significance. See A. Simms, 'The early origins and morphological inheritance of European towns', in J. W. R. Whitehead and P. J. Larkham (eds), *Urban Landscapes: International Perspectives* (London and New York, 1992), 23–42.

[58] *P.Oxy.* II 335 (AD 85). The Jewish *amphodon* may be identical with the Cretan. In AD 133 (*P.Oxy.* I 100) empty houses were sold in an *amphodon* called the 'Jewish alias Cretan'. Most of the references to the Cretan *amphodon* are later than the Jewish revolt of AD 115–116, though there is a single reference in a status declaration of AD 260 to a Domitianic registration in this *amphodon* (*P.Oxy.* XVIII 2186).

[59] *P.Oxy.* VII 1037 attests an *agora* of the Shoemakers' *amphodon* but it is possible that the name was derived from a particularly prominent establishment or quite a small concentration of cobblers.

[60] *High numbers of attestations:* Hermaion, Lycian Camp, Plateia, Cretan cf. Pammenes' Paradeisos. *Moderate numbers:* Dromos of the Gymnasium, Pammenes' Paradeisos, Murobalaneion, South Dromos, Dromos of Thoeris, Herakles' topon, Gooseherds. *Low numbers:* Hippodrome, Shepherds, Temgenouthis, South Quay, Tenth.

[61] We have no evidence for the size of Panopolis but it seems likely that the survey covers 10–30% of the city.

designations and some of those designations were further grouped. Although the evidence poses serious problems, by comparing actual distribution of these groups with 10,000 computer-generated randomisations of the data, we have achieved extremely high accuracy. We use four different criteria: the longest gap between attestations (showing absence from an area), the longest consecutive group of individuals, the total of the shortest gaps between at least half the group (identifying clustering), and the total of three longest gaps (showing partial absence from an area). Analysis shows that none of the groups considered had a regular pattern of distribution (no group was either spread evenly across the whole area or clustered in an extremely small district), but several groups were not randomly distributed. We list in Table 4 those groups tested whose distribution appears to have been random and groups which display significant clustering.

The most strongly aggregated group is the naval workers (sailors and shipwrights). By

TABLE 4. *Distribution of social groups*

A. *Groups showing random distribution of members*

1. Educationalists and educated workers[1]
2. Educationalists, educated workers and administrators
3. Educationalists, educated workers and elite[2]
4. Educationalists, educated workers, elite and army officers
5. Educationalists and elite
6. Educated workers and scribes
7. Elite, army officers, chief priests and former chief priests and district scribes
8. Elite, priests, chief priests and former chief priests
9. Elite and goldsmiths
10. Religious buildings
11. Priests (excluding chief priests and former chief priests)
12. Priests, including chief priest and former chief priests, and temple scribes
13. Priests, chief priests and former chief priests, religious buildings, and temple scribes
14. Priests and religious buildings
15. Goldsmiths
16. Construction workers, engineers, and architects
17. Cloth workers and cloth retailers
18. Food retailers
19. Food producers
20. Food retailers and producers

B. *Groups showing concentration of members*[3]

1. Elite and army officers
2. Miscellaneous scribes (excluding linen-workers' scribe) and administrators
3. Naval workers[4]
4. Metal workers

[1] Educated workers include doctors, lawyers and musicians.

[2] The elite are defined here as those who hold or have held magisterial offices and relatives of these men.

[3] These groups are those for which the real distribution was more strongly aggregated than 95% of the randomised data. For groups 1–3, the pattern is strongest for the measure which identifies clustering. For the metal workers, the measure which identified absence from large sector of the city provided the strongest pattern.

[4] Naval workers include shipwrights and sailors.

the nature of their profession, these men would have spent their working lives on or near the river and it is no surprise to find them clustering together, presumably near the city quays. Concentration of the noisy, perhaps also malodorous and potentially dangerous, metalworking may reflect administrative concerns to protect the city from pollution and from the risk of fire. There was some concentration of administrators and scribes, but rather surprisingly, these groups do not appear to have concentrated in elite areas. The clustering of the elite, including army officers, is significant and suggests a limited social segregation in the city, confirming our assessment of the evidence from the Oxyrhynchite *amphoda*.

To establish gymnasial status at the examinations held when a male child had reached the age of fourteen, it had to be demonstrated that the boy was descended from parents of gymnasial status. The documentation used to make this claim traced direct descent down the male and female lines to a revision of the gymnasial registers, normally that under Vespasian.[62] In so doing, the district of registration was given. The few surviving documents from Oxyrhynchus allow analysis of the movement of gymnasial families between generations. This shows that residence patterns were essentially conservative. There was a tendency for children to reside in the same district as their parents, but in 60% of cases (24 from 40 generations), there was a change of residence.[63] These shifts in male residence are not obviously related to the female place of residence before marriage, though our knowledge of the mother's family is often less good. It does, however, seem that Egyptian society was generally patrilocal and although households composed of brothers, sometimes with wives and children, are common, households composed of sisters are not.[64] The new *amphoda* in which these men settled were not, however, chosen randomly, and five of the shifts (21%) were returns to *amphoda* inhabited by previous generations of the family. The chances of this being a random pattern are negligible.[65] For some reason, these men were being drawn back to their ancestral *amphodon*. The returns, even after the establishment of a separate households in different *amphoda* for a generation or more, are evidence of a strong emotional tie probably to a residence which was perceived as the main house of a family, and, irrespective of whether an extended family was co-resident, demonstrate an attachment to the extended family among the gymnasial class.[66]

P.Oslo. III 111 attests some topographical concentration of the housing owned by members of the elite and some leasing to social dependants.[67] The scale of such activities is, however, small and the housing and rental market in Oxyrhynchus seems too active for a society in which residence patterns were closely linked to political affiliation and patronage networks. House sale documents do not suggest that it was common for

[62] C. A. Nelson, *Status Declarations in Roman Egypt* (ASP 19; Amsterdam, 1979), 26–35.

[63] Although the data is slight, it can be subjected to analysis. This shows to a 95% probability that 41–72% of males remained in the district of their father's registration.

[64] Bagnall and Frier, *Demography of Roman Egypt*, 62–4; 179–312.

[65] The usable body of data is very small since only the second shift of the family is significant. There is a 95% probability that 14–64% of those whose fathers' had moved would return to the grandparental district. Assuming 28 total districts, we would expect only 4% to return if choice of *amphodon* was random. The chance of the attested pattern being random is less than 3%.

[66] A possible model would be to postulate a main family house which was outgrown in the natural cycle of the family and returned to by the particular branch once the family had been reduced by death or other members of the family, especially females, leaving the house on marriage.

[67] See, for instance, the concentration of houses owned by Didymus and occupied by his dependants.

neighbours or relatives of vendors or neighbours to buy houses. In the majority of cases, there is no visible prior relationship between vendor and vendee or between vendee and the neighbours of the property. An individual renting urban housing could change his district of residence.[68] In itself, the shifts in residence over generations suggest that residence was not determined wholly by familial links to a neighbourhood and that branches of an extended elite family could have residences in separate districts of the city. This and the distribution of elite in Panopolis demonstrate that the Egyptian city was not a network of enclaves dominated by individual families, their dependants and close relations.

From the time of Augustus, the gymnasial group, which probably formed the core of the later curial order, was represented as an elite group within the city. As the gymnasium was the centre of Greek culture, the division between this elite and the rest of the population had cultural and ethnic significance. Since even a social division only partially reflected in residence patterns may have been perceived as a fundamental feature of urban topography, the representation in the topography of the Romano-Egyptian city of the separation of the Greek elite suggests that this was the fundamental division of urban society.[69]

It is notable that other groups are randomly distributed. Religious buildings and priests are not concentrated in specific areas. Given the centrality of the old Egyptian temples and the way in which the Graeco-Roman elite had constructed Roman-style city temples and facilities, one might have expected a far greater level of concentration of religious buildings and that priests would have formed a distinct social and residential group even in the early fourth century AD. The distribution of shrines and temples spread across the city perhaps reflects popular religious practice.

Neither *P.Berl. Bork.* nor the documents from the Oxyrhychite *amphoda* suggest strongly defined and distinct trade quarters. There does not seem to have been a consistent pattern of segregation by trades, though there were concentrations of certain specific trade activities. Professional associations do not appear to have formed fundamental social and political groups. In the highly regulated economy of the Egyptian city, the level of distribution of tradesmen across the city is somewhat surprising.

Conclusions

It is a long established tradition of Western culture that the impact of urbanism on society is fundamental and usually deleterious. The city by its very existence affected economic and social structures and established an urban lifestyle that differed radically from that of the countryside. Modern and, to a certain extent, ancient commentators have regarded urbanism as a socio-economic phenomenon and therefore legalistic discussions and definitions of the city risk obscuring the socio-economic settlement hierarchy and the nature of ancient urbanism. By adopting relative population as our primary criterion, having observed that all settlements display a fairly high level of housing density, we have established categories of settlement. We have observed the marked differences in occupa-

[68] *P.Oxy.* XL 2898; *P.Oslo.* III 111.

[69] D. Cannadine, 'Residential differentiation in nineteenth-century towns: From shapes on the ground to shapes in society', in James H. Johnson and Pooley (eds), *The Structure of Nineteenth Century Cities*, 235–51, notes that writers of the period tended to emphasise district differentiation in the city, comparing the poorer areas to 'Darkest Africa', although such profound distinctions cannot be traced in the census material.

tional structure and economic function between second and third rank settlements and propose that the second rank settlements be considered urban. These cities are characterised by a comparatively high proportion of the male population (*c.* 25%) having non-agricultural occupations. The cities also appear to have been important trading centres. We have also suggested that the urban population was comparatively wealthy and the evidence from house prices and domestic architecture suggests that the cities had a concentration of elite residence. Although we have detected, unsurprisingly, certain settlements which did not conform entirely to either urban or village typologies, we have established that the cities were distinct and operated with economies fundamentally different from those of villages.

It is likely that these differences in economic fundamentals affected social structures. The greater diversity of economic status, as displayed in domestic architecture, and of occupation gave the cities a more heterogeneous population. It is not immediately apparent whether this relative diversity led to the kind of social dislocation and alienation which is so often associated with urban life and balances the medieval German perception that 'city air makes free'. The historical reality of such a differentiation of urban and rural society is difficult to separate from romantic depictions of rural idylls.[70] Generalisations about the relative strength of community spirit and the level of integration of individuals into society are problematic enough for commentators on contemporary society and Richard Alston has argued elsewhere that even villages may not have displayed the level of social cohesion in the first three centuries AD attested in ethnographic studies of more modern villages.[71] Nevertheless, it is likely that the family, and especially the extended family, was an important mechanism for the integration of the individual. We have seen that despite the lesser emphasis on the extended family in household formation, the gymnasial elite continued to place emphasis on the extended family. Membership of the gymnasial class was dependent on descent and it is by no means clear that this investment in descent, and therefore in the extended family, would have been mirrored by other social groups in the city. Although the extended family tended not to be co-resident, it remained an important social unit for at least one group.

Better evidence for a lack of social cohesion in the urban community comes from the residential pattern of the elite. The elite were distinguished not merely by their place of residence but also probably by their culture and possibly by the architecture of their houses. We should not, however, be too pessimistic and assume that the elite isolated themselves completely from an urban mob. Although there is little evidence of individual members of the elite making extensive use of devices such as patronage to bridge the social gulf with the rest of the population, the urban authorities exercised a certain benevolent responsibility in providing facilities for the urban population and ensuring their food supply. The manifest social divisions of the city did not entail a complete absence of social cohesion any more than the tendency to form households based around simple family structures means that the extended family was unimportant. Nevertheless, these factors allow the possibility that the urban community displayed a comparative lack of cohesion which may have given its more heterogeneous society an air of freedom.

[70] See, for example, the survey of depictions of town in country in R. Williams, *The Country and the City* (London, 1993).

[71] 'Violence and social control in Roman Egypt', *Proceedings of the XXth International Congress of Papyrologists* (Copenhagen, 1994), 517–21.

BRIEF COMMUNICATIONS

A ghost-name of a *ḫrd n kȝp*

The name *Nn-ḏw-r.f*, supposedly borne by a *ḫrd n kȝp*, should be read *Nn-tȝ-wȝ-r.f*. The name was misread in a later report on excavations in the Theban necropolis at the beginning of this century. Subsequently the stelephorous statue involved was published, but because of the misinterpretation, the link with the excavations was not made. The discarding of this ghost-name thus shows us exactly where some of the objects belonging to the funerary equipment of this well-known official of the Eighteenth Dynasty were found.

In her study of the social position of the child in ancient Egypt, E. Feucht gives a list of the people known to have taken the title of *ḫrd n kȝp*.[1] Her number 58 is a certain *Nn-ḏw-r.f*, 'chief of the *wab*-priests' (*mr wꜥb*[*.w*]). The name is not to be found in Ranke, *PN*, and would be a ***hapax legomenon***. As the only source for this *ḫrd n kȝp* she refers to the unpublished notes of the excavations in Sheikh Abd el-Gurneh by Sir Robert Mond in 1905 and 1906.[2] These describe a pit about 45 metres south-east of the tomb of Nakht (TT 52), in which a sandstone statue belonging to this 'Nen-dju-ref' was found together with a wooden painted stela and 34 funerary cones.[3] In his version of the inscription on the statue, K. A. Kitchen, relying on the notes of Mond for lack of a photograph or the actual object, read the name as  .[4]

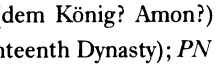
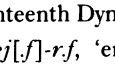
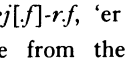
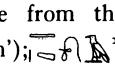
If we reexamine the list provided by Feucht, it can be observed that number 37, Kamose, has a second name Nentawaref (*Nn-tȝ-wȝ-r.f*).[5] This man is a well-known official, whose tomb in the Theban necropolis has been discovered, and of whom a statue, a number of funerary cones and even a forgery of a canopic jar, all bearing his name, have been published. He is an 'overseer of the royal *wab*-priests in [the estate of] Amun'.[6] The similarity of both name and title to those of the supposed *Nn-ḏw-r.f* leads to the suspicion that the latter might well be identical to the

[1] *Das Kind im Alten Ägypten. Die Stellung des Kindes in Familie und Gesellschaft nach altägyptischen Texten und Darstellungen* (Frankfurt and New York, 1995), 272–93.

[2] L. Collins, 'The Private Tombs of Thebes: Excavations by Sir Robert Mond 1905 and 1906', *JEA* 62 (1976), 18–40.

[3] Ibid. 33.

[4] Ibid., fig. 3. For the circumstances in which his autographed version was made, see ibid. 18–19.

[5] Rather than her *Nn-tȝ-wȝ-r.f*. For the name, cf. H. Ranke, *PN* I, 169, 3; XXIV; II, 364, 'es gibt kein Land das fern von ihm (dem König? Amon?) wäre!'. Compare also the names  (a male name of the New Kingdom (Eighteenth Dynasty); *PN* I, 204, 22; XXV: compares with I, 169, 2 (error for 3); in II, 371, Ranke wants to read *Nn-wȝj*[*.f*]*-r.f*, 'er (der Gott) entfernt sich nicht von ihm (dem Kind)');  or  (a male name from the Old, Middle and New Kingdoms; *PN* I, 204, 21; II, 371, 'er wird sich nicht entfernen');  (a feminine name of the New Kingdom; *PN* I, 376, 15; compare the name *Tȝ-wȝj* without road-determinative, which is attested on funerary cones of the Eighteenth Dynasty, all belonging to the same woman. These last names are perhaps more likely to be connected with *PN* I, 377, 7–10).

[6] According to the statue. For a survey of all his objects, cf. Feucht, *Das Kind im Alten Ägypten*, 285, no. 37, nn. 1439–41. On the funerary cone no. 13 in N. de Garis Davies and M. F. L. Macadam, *A Corpus of Inscribed Egyptian Funerary Cones* (Oxford, 1957), he is *mr wꜥb n 'Imn*; see nos. 118–19, belonging to the same person: Ranke's reading (*PN* I, 258, 11) *Ḥtp-n.j-tȝ-wȝ*... should be deleted, as already remarked by M. Thirion, 'Notes d'onomastique. Contribution à une révision de Ranke *PN*', *RdE* 31 (1979), 85. Ranke's reference to Heidelberg 1015 on p. XXVII as another example of that name remains unclear because the inscriptions of this coffin are still largely unpublished: see E. Feucht, *Vom Nil zum Neckar. Kunstschätze Ägyptens aus pharaonischer und koptischer Zeit an der Universität Heidelberg* (Berlin, 1986), 121–3, no. 277.

better known *Nn-tȝ-wȝ-r.f*. And indeed, the proof of this hypothesis is provided by another object attributed to him, a stelephorous statue now in Boston. It was published in the catalogue of a recent exhibition,[7] with a clear photograph on which his name can indeed be read  . The orthography of the name and the remainder of the text make it certain that the Boston statue and that discovered near TT 52 in 1905/1906 are one and the same. The provenance of this piece is thus well established and the name *Nn-ḏw-r.f* can be discarded as another ghost-name.

MARK DEPAUW

A shield bearer and warrior of Ramesside times*

A Ramesside stela fragment featuring a shield bearer and a warrior prompts consideration of these positions in military contexts of the period. It is suggested that at best the shield bearer played only a semi-military role, his court duties being more in evidence, while 'warrior' (*ḥȝ*), in spite of the implications of the title, remained a non-specific term.

THE upper part of a round-topped stela in limestone in the Glasgow Museums records two 'military' men of the Ramesside Period. The stela (pl. XXIV, 1) is 11 cm high, 16.2 cm wide and 3.7 cm deep and bears the registration number 28au-13. It is unprovenanced but was given to Glasgow in 1913 by the British School of Archaeology in Egypt, through Miss May Buchanan, one-time Secretary of the Glasgow section of the Egypt Students Research Association.

On the surviving portion of the stela, two kneeling male figures are represented, one from the waist up, the other almost complete. Both face left, each with upraised hands. The man on the left wears a long full wig descending to a point on his chest. On his upper body he has a shirt with tight elbow-length sleeves. What appears to be a flared sleeve on his left arm as seen in plate XXIV, 1 is due to a projecting piece of flint on the surface of the stela and is omitted in figure 1. The right-hand man has close-cropped hair(?) or a shaven head and wears an ankle-length kilt. Both the long wig and the kilts rising high at the back of the waist are typical of the Ramesside Period. The figures and accompanying brief text are rather sketchily incised on the stone to fill the space available.

The text (fig. 1) is arranged over and between the heads of the men, with three vertical dividing lines. The inscription reads: *qry Ḥrỉ ḥȝ ʿȝ S*,[1] 'The shield bearer Hori (and) the great warrior Si'. The writing of *qry*, 'shield bearer', (*Wb.* V 57, 18) is a variant of  *qrʿw* (*Wb.* V 59, 12);[2] others include  . The Nineteenth Dynasty stela of Amenhotep called Huy (BM EA 166),[3] provides two examples of the title. In the third register, *Mr(i)-Rʿ* (Mer(i)-Re) has the title, written  and in the fourth register a man *Pȝ.hw* (Pa-hu) occurs as 'shield bearer (of his majesty)', with the word rendered  . The Egyptian verb *qri*, 'draw near', 'attend',[4] underlies the primary employment of a *qrʿw* as someone who attends another person. When this involves

[7] Boston MFA 1986.747: E. Brovarski, in S. D'Auria, P. Lacovara and C. H. Roehrig (eds), *Mummies and Magic. The Funerary Arts of Ancient Egypt* (exhibition catalogue; Boston, 1988), 148–9 (no. 89).

*My thanks are due to Dr M. L. Bierbrier who kindly read a draft of this article and made very helpful suggestions. The comments of the *JEA* referees were also of considerable assistance.

[1] H. Ranke, *Die ägyptischen Personennamen*, I (Glückstadt, 1935), 278.2. A *JEA* referee has suggested that the second man could be 'the warrior ʿAa-S(u)' *as ḥȝ* is not a formal title, *s(w)* can stand for *sw* in this period and a feminine parallel *ʿȝ-s(y)* is found in Ranke, *PN* I, 58.9.

[2] W. Helck, 'Schildtrager', *LÄ* IV, 132. On the Glasgow stela the word appears as  with the *q*-hieroglyph 𓌙 resembling an arrowhead.

[3] T. G. H. James, *Hieroglyphic Texts from Egyptian Stelae etc. The British Museum* 9 (London, 1970), 27, pls. xxii and xxiia.

[4] R. O. Faulkner, *A Concise Dictionary of Middle Egyptian* (Oxford, 1962), 280.

royalty, it strengthens the notion of a court duty rather than a military one. The latter role could operate in battle, highlighting the shield bearer's army connection. Commenting on chariot equipment as used by the military establishment at Ugarit, Rainey[5] equates the word for 'shield', in Akkadian *kabābu* (a synonym for *arītu* and *takšu*), in Ugaritic *qlʿ*, with Egyptian *qrʿw* with its determinative of a shield.

Representational and textual evidence for both shield bearers and warriors in New Kingdom contexts is limited, to the extent that one hesitates to place them as regular members of army units.[6] Schulman[7] gives three types of personnel involved in the chariotry: charioteer (*kḏn*), shield bearer (*qrʿw*) and chariot warrior (*snnj*). He states further that there is never more than a two-man crew; the charioteer drives and is sometimes depicted fighting or holding a shield to protect the warrior. Both men can be shown in battle, with a shield slung on the back of one of them. There would appear to be no place for the shield bearer (*qrʿw*) as such in the chariot, given the

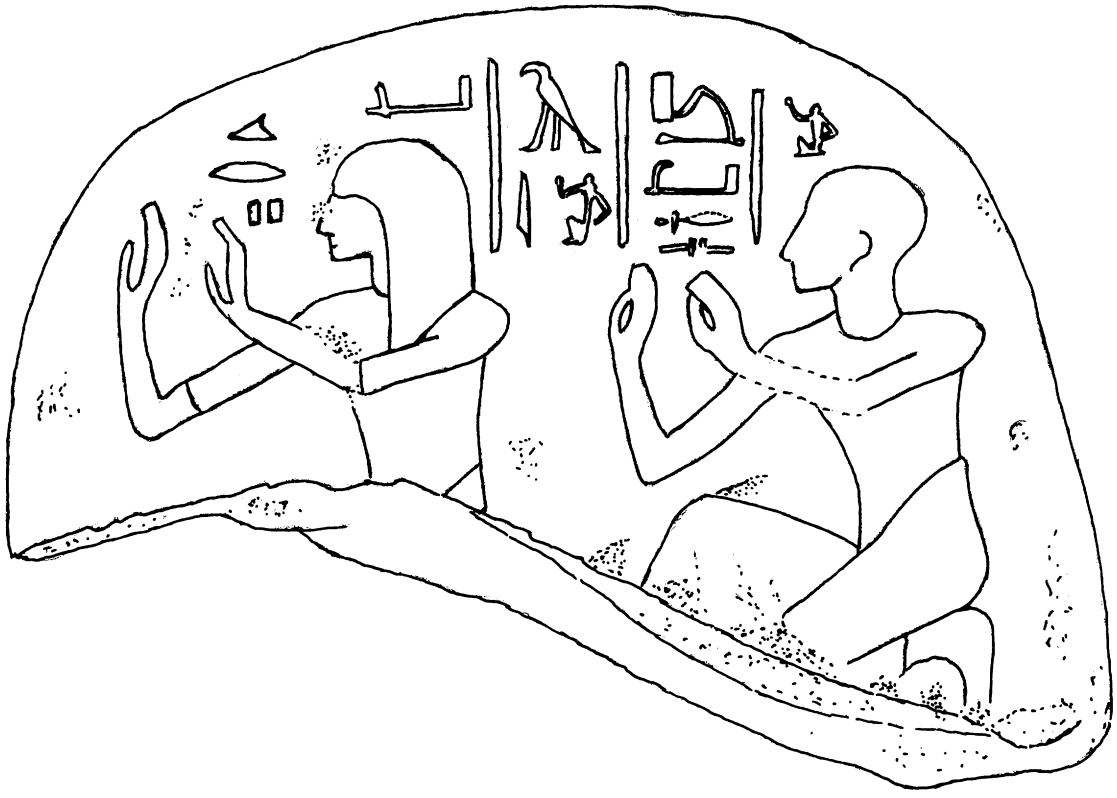


FIG. 1. Glasgow Museums, 28au-13.

[5]A. F. Rainey, 'The Military Personnel of Ugarit', *JNES* 24 (1965), 22.

[6]In his study of the Egyptian army, R. O. Faulkner, 'Egyptian Military Organization', *JEA* 39 (1953), 32–47, does not mention the shield bearer in relation to the New Kingdom army. Concerning the warrior, he gives an example from the Middle Kingdom stela of Khu-Sebek, who at one stage in his career was 'warrior of the bodyguard' (lit. 'warrior following after'); 'warrior', *ḫ;wty*, is Faulkner's 'professional soldier'. In the early New Kingdom, Ahmose son of Ibana was appointed a 'warrior of the ruler', for his services in Nubia under Amenhotep I.

[7]A. R. Schulman, *Military Rank, Title and Organisation in the Egyptian New Kingdom* (MÄS 6; Berlin, 1964), 67.

normal complement of two. The few occasions when shield bearers are depicted in relief scenes show them in the presence of the king as part of his retinue rather than as members of a fighting unit, although an exception to this is noted in a Nubian campaign of Ramesses III (see below). This paucity of evidence for their activities is noted by Schulman,[8] who cites only two occurrences of protocols of shield bearers and deduces that the title did not denote a rank in the army. At the battle of Qadesh, Ramesses II was accompanied in his chariot by his shield bearer (*qrʿw*) named Menna, as commemorated in the *Poem*[9] eulogizing the king's part in the action. In paragraphs 272–3 of the *Poem*[10] the king states: (272) 'They were the ones whom I found in the midst of the enemy together with my charioteer (273) Menna my shield bearer'. On this use of two titles for Menna, Schulman[11] comments that Ramesses drove the chariot and the second man served as a subordinate 'chariot warrior' and 'shield bearer' and that the person would have been an officer, that is, a 'charioteer'. Certainly in this episode, in the heat of the engagement, the shield bearer would have performed more than just a ceremonial or court role.

An example of shield bearers in action on the battlefield occurs in the relief scenes at the mortuary temple of Ramesses III at Medinet Habu. On the outer face of the west wall at the left end of the lower register the king is depicted in battle with Nubians,[12] and a section of chariotry has the superscription *kḏnw n ḥnw qrʿw n Pr-ʿ ʿnḫ wḏ snb*, 'charioteers of the Residence and shield bearers of Pharaoh, life, prosperity and health'. The *qrʿw* defend the charioteers in each case with a raised shield which is circular in shape rather than the normal round-topped rectangular type.

The close association with the monarch, 'of Pharaoh' in the last case, is reinforced in two further depictions at Medinet Habu. A group of shield bearers attend Ramesses III as he mounts his chariot to commence the first Libyan campaign.[13] Here they serve as part of the king's bodyguard as the inscription relates: *kḏnw ḥryw mškbw qrʿw n pr ḥtr ʿ n[ty] m šmsw ḥm.f*, 'the charioteers, the chiefs of *mškbw*[14] and the shield bearers of the great span w[ho are] in the bodyguard (lit. 'following') of his majesty'.[15] In this instance the *qrʿw* are on foot and stand in files alongside the charioteers and chiefs of *mškbw*. The equipment carried includes bows, quivers, spears, sickle-swords and regulation shields, but there is no specific allocation which would identify an individual as a shield bearer. On the exterior of the first pylon, on the west face of the north tower, in the re-entrant angle between the tower and the north wall, Ramesses III is in battle with Libyans.[16] Two bowing figures in the top right-hand corner of the lower scene are described as *kḏnw* [*qr*]*ʿw n ḥm.f nty m šmsw n nṯr nfr*, 'charioteers and [shield] bearers of his majesty who are in the following of the Good God'. Neither person displays any obvious military aspect in costume or equipment, once more hinting at the court nature of their position on this occasion.

In Ramesside times shield bearers generally appear in the service of royalty, their titles being qualified by such phrases as 'of his majesty' or 'of the Good God'. Occasionally the title is found alone; Mer(i)-Re of BM EA 166 (mentioned above) and Hori on the Glasgow stela are cases in point. A letter written by a priest, Kharu of the House of Horus, to a royal scribe and steward

[8] *Military Rank*, 68 and 162 (refs. 477–8).

[9] Battle of Qadesh, *Poem*, 205 = K*RI* II, 66.1–6 (writing variants).

[10] K*RI* II, 83.6–16.

[11] *Military Rank*, 67 and 114.

[12] H. H. Nelson, *Medinet Habu*, I. *Earlier Historical Records of Ramesses III* (Epigraphic Survey, OIP 8; Chicago, 1930), pl. 9 = K*RI* V, 8.12.

[13] Nelson, *Medinet Habu* I, pl. 16 = K*RI* V, 12.12.

[14] Schulman, *Military Rank*, 48 renders *mškbw* as 'officers?'.

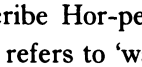
[15] W. F. Edgerton and J. A. Wilson, *Historical Records of Ramesses III. The Texts in* Medinet Habu *Volumes I and II* (SAOC 12; Chicago, 1936), 8 and n. 16b. In the footnote the distinction between *kḏn* and *qrʿw* is made and attention drawn to the word for 'shield bearers' having been recut from to the present  .

[16] Nelson, *Medinet Habu* II, pls. 67(B) and 68 = Schulman, *Military Rank*, 121 (ref. 220).

Ptahemhab,[17] mentions a 'shield bearer of Inwau'.[18] The text refers to the servant of the shield bearer having been with Ptahemhab in Memphis and the 'great one of the house', registering the little brother of the said servant to be a groom. The implication is that the charioteer Inwau had a shield bearer (unnamed) who was recognized as his companion, forming, in partnership, the chariot unit. It also points to the shield bearer's social standing in his having a servant. Another letter[19] from a chief of record keepers of the granary addressed to the scribe of a priest contains a list of people who are to be exempted from corvée work and includes '... a shield bearer of his majesty l.p.h. ...'

That persons of foreign extraction were employed in the Egyptian army in the New Kingdom is well established. At Thebes, Winlock found the coffin of It-Amun, a 'shield bearer of the general', of the late Twentieth to early Twenty-first Dynasty. His full bushy beard suggests that he is an Asiatic.[20] A damaged text on a stela of Ramesses III[21] in the sanctuary of Ptah at the Valley of the Queens is concerned with enemy captives who were recruited into the Egyptian army, and we read: 'They are made shield bearers, charioteers and retainers who bear the fan while following the king'. Again ceremonial duties are stressed.

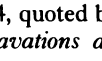
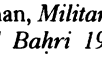
The other title on the Glasgow stela, namely 'warrior' (*ḥ3*), occurs infrequently in the New Kingdom, although used of the king in the heroic sense. For instance, *ḥ3 qnt* applied to Sety I[22] at Karnak, where in an undated campaign against the Hittites, he returns in triumph with prisoners. It does not normally appear as a title or rank in regular military formations. A *ḥry ḥ3wtyw*, 'commander of warriors', is attested on a papyrus in the British Museum, in the person of a certain Wey.[23] The personnel, *ḥ3w*, in this case are serving on board a *ṯ3rt*-boat. In the Karnak record of the Libyan war in Merenptah's fifth year,[24] a *tpy n ḥ3 nb*, 'chief of every warrior', appears. From the same source *ḥ3* and *phrr*, 'warrior' and 'runner' (or 'chariot escort'),[25] occur with the former apparently employed as a generalized term. Ramesses III's account of the first Libyan campaign of his fifth year refers to enemies of the Egyptians as *n3y.sn ḥ3w*, 'their warriors'.[26] These uses of the word 'warrior' underline the lack of a specific role for the people thus designated.

In the post-Ramesside period a type of officer of shield bearers is encountered with the title *ḥry qrryw*, 'commander of shield bearers'. A Twenty-first Dynasty letter from El Hibeh[27] written by the god's father and temple scribe Hor-pen-ese to the  Sha-puti concerns the expected arrival of horses, but also refers to 'warriors' who had been badly treated and the need for vigilance on the ramparts. The same title is found on the Dakhleh stela[28] of the fifth year of

[17] P. Bologna 1094, rt. 9, 3–6, quoted by Schulman, *Military Rank*, 105 (ref. 116).

[18] Inwau appears in P. Anastasi III, vs. 6/1–5/9 (The Border Journal) under the entry: 'Year 3, month 9, day 25: Inwau, the charioteer of the great stable of Banire-Miamun of the Residence went up'; cited by A. R. Schulman, 'The First Dynasty Egyptian Presence at ʿEn Besor in the Sinai', in D. P. Silverman (ed.), *For His Ka. Essays Offered in Memory of Klaus Baer* (SAOC 55; Chicago, 1994), 243.

[19] P. Turin A, vs. 4, 1–4, quoted by Schulman, *Military Rank*, 110–11 (ref. 141).

[20] H. E. Winlock, *Excavations at Deir el Bahri 1911–1931* (New York, 1942), 34, pl. 80, where the title  *qrr(w)* occurs in the central vertical column on the outer coffin lid: W. C. Hayes, *The Scepter of Egypt*, II (New York, 1959), 407, gives the name  as 'Yoty-Amun'.

[21] L*D* III, 218c (plate) and III, 224 (text) = K*RI* V, 90–1.

[22] L*D* III, 130b = W. Wreszinski, *Atlas zur altaegyptischen Kulturgeschichte*, II (Leipzig, 1923–35), pl. 47 = K*RI* I, 18.9.

[23] P. British Museum EA 10204 (unpublished). I owe this reference to Dr M. L. Bierbrier and Dr R. B. Parkinson; see S. Birch, 'Varia', *ZÄS* 7 (1869), 27; Schulman, *Military Rank*, 53 and 106 (ref. 119).

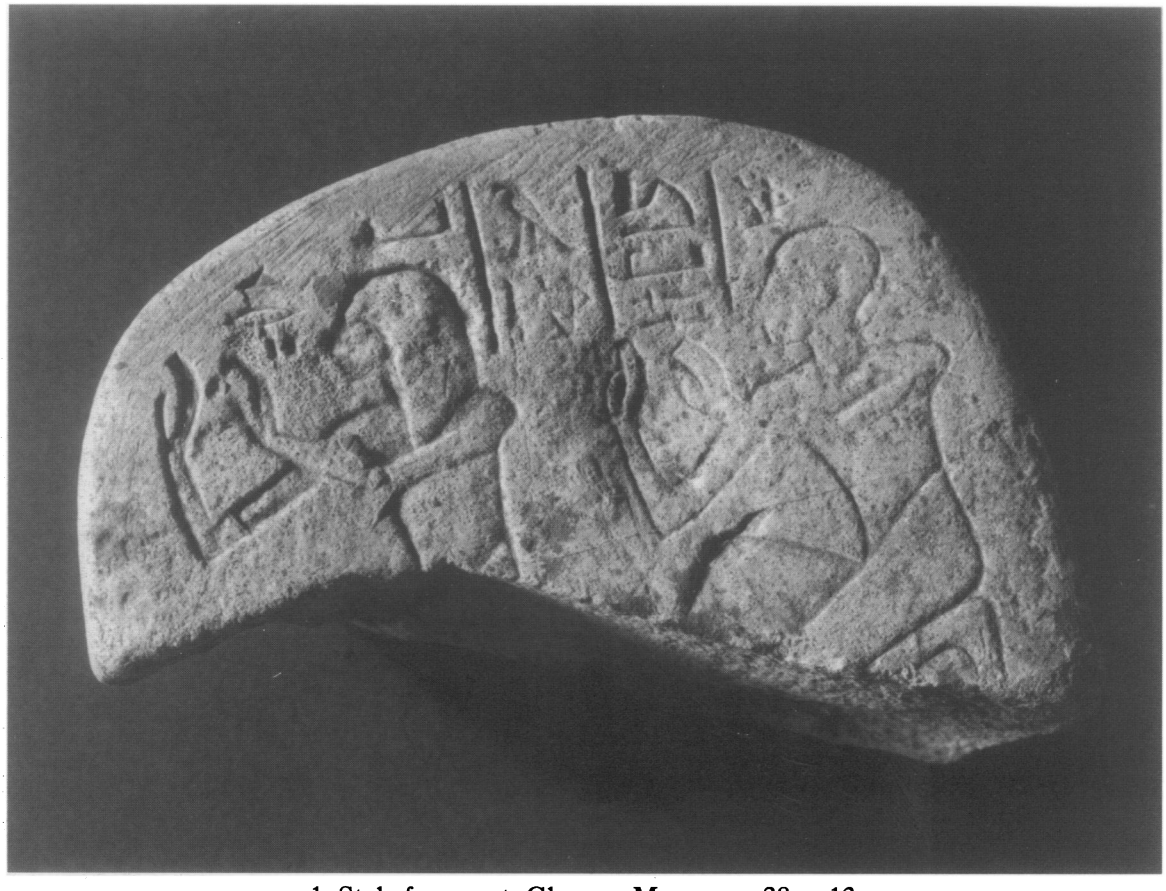
[24] K*RI*, IV, 4.2.

[25] K*RI*, IV, 3.15.

[26] Nelson, *Medinet Habu* I, pl. 28, l.44 = K*RI* IV, 22.13.

[27] P. Strasbourg 33: W. Spiegelberg, 'Briefe der 21. Dynastie aus El-Hibe', *ZÄS* 53 (1917), 7–9, pl. ii; P. Vernus, in *Tanis, L'or des pharaons* (Paris, 1987), 106, where P. Strasbourg 33 is incorrectly referred to as P. Strasbourg 31 and *ḥry qrryw* rendered as 'chef des conducteurs de char'.

[28] A. H. Gardiner, 'The Dakhleh Stela', *JEA* 19 (1933), 27 and pl. vii. In his comments Gardiner draws attention to the El Hibeh letter and the problems of transcribing the hieratic form of the title there.

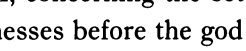


1. Stela fragment, Glasgow Museums, 28au-13
(*Courtesy of Glasgow Museums*)

A SHIELD BEARER AND WARRIOR OF RAMESSIDE TIMES (pp. 218–22)

2. Inscription on the wrappings of the mummy of Heron son of Ammonius (reproduced from Petrie, *Roman Portraits and Memphis (IV)*, pl. x.3)

HERON 'BEARER OF *PHILOSOPHIA*' AND HERMIONE *GRAMMATIKE* (pp. 223–6)

Shoshenk I, concerning the settlement by oracle of a dispute over water rights at the oasis. One of the witnesses before the god Setekh was the  Pedu...

On the stela in Glasgow, the presence of two persons on the same monument could point to their sharing family ties or close companionship due to their official positions. Of these possibilities the former is the more likely, since 'warrior' as such is not normally associated with 'shield bearer' in relief scenes. Without the text which presumably occupied some or all of the missing bottom section of the stela, it is not possible to elucidate the relationship, if any, between the men.

JAMES K. THOMSON

A re-identified fragment from the tomb of Ibi (TT 36)*

Publication of British Museum EA 445, a fragment of limestone relief identified as coming from the tomb of Ibi (TT 36).

BRITISH Museum EA 445 (pl. XXV) is a fragment of a tomb relief in limestone. There is no record of its provenance in the Department's registers, and it has remained unpublished, although it was for many years exhibited as no. 468 and dated to the Eleventh[1] or Eighteenth Dynasty.[2]

The relief is actually part of the Saite tomb of the Chief Steward of the Divine Adoratrice Ibi at Thebes (TT 36), published by Klaus Kuhlmann and Wolfgang Schenkel, and belongs to the south wall of the southern pillared hall.[3] The relief is shown still in place in a watercolour done by Gardiner Wilkinson, between 1821 and 1826,[4] and in a squeeze made in 1826, now also in the British Museum.[5] There is no record of when the relief entered the Museum's collections, but it was listed in the synopsis of the Museum's collections of 1847.[6] A brief account is offered here.[7]

The piece measures 30.8 × 22 cm; it is now mounted in plaster on a panel of slate, the total depth being 5.6 cm. The bottom and left edges are regular and smooth, but the top left corner and the right edge are fragmented.[8] The scene is carved in shallow sunk relief. The shallow vertical chisel marks which are a feature of background treatment elsewhere in the tomb are present here. In the centre of the fragment, the surface of the stone was damaged and repaired with plaster in ancient times. The squeeze reveals that only a small patch of this plaster area had lost its top surface in 1826, but now it has decayed slightly to a rough granular texture. The dark patches visible on the photograph are due to a substance, apparently wax, which was applied at some point in the piece's early history in the Museum to conserve these fragile areas of the

*I am most grateful to Lisa M. Leahy and Wolfgang Schenkel for comments on a draft, and to W. V. Davies for permission to publish this piece.

[1] Old display label.

[2] E. A. W. Budge, *A Guide to the Egyptian Galleries and Vestibule* (London, 1909), 132 (mentioned but not illustrated).

[3] PM I.1, 65 (8); K. Kuhlmann and W. Schenkel, *Das Grab des Ibi: Theben Nr. 36* I *Beschreibung der unterirdischen Kult- und Bestattungsanlage* (AV 15; Mainz am Rhein, 1983), 89–106, pl. 30 (hereafter *Das Grab des Ibi* I).

[4] Wilkinson Manuscript III 24 (Griffith Institute, Oxford); published: *Das Grab des Ibi* I, 28, pl. 103. The copy is generally accurate for the figures on EA 445, although the raised leg of the kneeling figure has been omitted.

[5] Wilkinson squeeze 2.121; a line drawing of the squeeze is incorporated in *Das Grab des Ibi* I, pl. 30.

[6] *Synopsis of the Contents of the British Museum* (51st edition; London, 1847), 143–4. This is the earliest reference that I have been able to trace; the piece does not feature in a manuscript list of objects obtained from Gardiner Wilkinson in the Department's records.

[7] It is hoped that the piece will be republished showing its exact position in the wall in the planned *Das Grab des Ibi* II.

[8] The piece is probably a 'Flickstein', rather than a fragment removed from the wall in modern times. Such stone patches are frequent in the tomb; *Das Grab des Ibi* I, 21.

British Museum EA 445 (*Copyright the British Museum*)

A RE-IDENTIFIED FRAGMENT FROM THE TOMB OF IBI (TT 36) (pp. 222–3)

surface, and which has subsequently absorbed dirt. Colour is extensively preserved on the figures' bodies (red), and on their equipment and artefacts (yellow); no other colours are visible.

One scene and part of another are preserved. Like the others on this wall of Ibi's tomb, they are derived, probably indirectly, from ones in the Sixth Dynasty tomb of the nomarch Ibi at Deir el-Gabrawi.[9] There is no carved register line at the base of the preserved scenes, but traces of red paint survive along the bottom edge of the fragment.

The right side of the fragment shows a figure of a standing scribe, facing right, with equipment over his rear shoulder, and a palette in his right hand.[10] The palette is yellow, and there are traces of yellow on the scribal equipment over his shoulder; the water pot is painted red, merging it with the man's body. The edge of a skull-cap is indicated at the nape of his neck, but the skull is coloured red.[11] This scribe originally stood behind a standing painter, and was identified with a caption as 'the colleague (*mḥnk*) (?) and scribe, Meseni (?)'.[12]

The main part of the fragment shows a man, facing right,[13] who is working with an adze on a square chest. The top of his head is damaged, but was coloured red.[14] Behind him is a chest with a cavetto cornice. Both figure and chests rest upon what seems to be another piece of furniture, forming 'eine (undurchschaubare) Verbindung von Kästen'.[15] The furniture and adze are painted yellow; the colour seems to have been clumsily applied, spilling below the bottom edge of the lower piece of furniture. The red paint also spills over the carved outlines of the figure in several places. There are no remains of hieroglyphs above the scene on EA 445, although fragments of several signs survive on the remains of the scene in the tomb, and are legible on Wilkinson's watercolour: 'Working a sedan-chair by ⟨a carpenter⟩'.[16] Comparison with the version of the scene at Deir el-Gabrawi, which shows the figure working on a recognizable sedan chair, suggests that the object in EA 445 is a Saite interpretation of what was by then an unfamiliar object.[17]

R. B. PARKINSON

Heron 'bearer of *Philosophia*' and Hermione *Grammatike**

This note suggests a new reading of a Greek inscription on the wrappings of a Roman mummy excavated by Petrie in the necropolis at Hawara in 1910–11. This reading may be relevant for interpreting the inscription of the famous mummy of Hermione from the same cemetery, now in Girton College, Cambridge.

THE excavations of W. M. F. Petrie at the Roman necropolis of Hawara in Egypt during the 1910–11 season yielded a rich haul of well-equipped mummies, some with gilded stucco

[9] PM IV, 244 (12–13); N. de G. Davies, *The Rock Tombs of Deir el Gebrâwi*, I (ASE 11; London, 1902), pl. 14. See *Das Grab des Ibi* I, 89–90. The same scenes are also attested in fragments from the tomb of Montuemhat (TT 34): see Peter Der Manuelian, *Living in the Past: Studies in Archaism of the Egyptian Twenty-sixth Dynasty* (London and New York, 1994), 1–59, esp. 24–8, 53–5.

[10] Description of right-hand scene: *Das Grab des Ibi* I, 99 (2.6/2.2.2.3//3.3, Subszene v.r. S 57).

[11] As shown in Wilkinson's watercolour copy; colour reproduction in J. Baines and J. Malek, *Atlas of Ancient Egypt* (Oxford, 1980), 106–7.

[12] Fragments of the caption survive, but not on EA 445: *Das Grab des Ibi* I, 99 (T 204), pls. 30, 103.

[13] Description of scene: *Das Grab des Ibi* I, 99 (2.6/2.2.2.3//4.1, Subszene v.r. S 58).

[14] Confirmed by the Wilkinson squeeze, which retains many traces of pigment.

[15] *Das Grab des Ibi* I, 99.

[16] *Das Grab des Ibi* I, 99 (T 205), pls. 30, 103. For *ḫwdt*, 'sedan chair', see e.g. E. Brovarski, 'An Inventory List from "Covington's Tomb" and Nomenclature for Furniture in the Old Kingdom', in P. Der Manuelian (ed.), *Studies in Honor of William Kelly Simpson* (Boston, 1996), I, 117–55, esp. 152–4.

[17] *Das Grab des Ibi* I, 99 no. 518. For examples of this phenomenon, see J. D. Cooney, 'Three Early Saïte Tomb Reliefs', *JNES* 9 (1950), 199–200, pl. xvi; E. V. Pischilova, '"Mistakes" in the Representation of Objects in Saite Reliefs of Daily Life', *GM* 139 (1994), 69–92, esp. 84.

*I would like to thank the anonymous reviewers for their helpful comments to a preliminary version of this note. Abbreviations of papyrological publications here follow those of J. F. Oates et al., *Checklist of Editions of Greek and Latin Papyri, Ostraca and Tablets*[4] (Atlanta, 1992).

carapaces, others with elaborate rhomboid external bandaging and painted portraits.[1] When found, few of these mummies were equipped with any kind of identifying inscription, whether written on an accompanying wooden label, the wrappings, or the portrait itself.[2] Out of the small number of inscribed mummies from Hawara, two bore texts which seemed to Petrie to indicate the deceased person's profession—a fact sometimes included on labels and inscribed bands from mummies, but very rarely, if ever, on portrait mummies.

One of these two is the mummy of Hermione, now in Girton College, Cambridge, one of the most widely-reproduced and famous portrait mummies. This fame is owed in part to the inscription on her portrait, which simply reads Ἑρμιόνη γραμματική (published as *SB* I 5753). This gnomic identification has spawned a whole series of mini-biographies based around the associations of the mysterious Greek word γραμματική, which has been translated variously as 'teacher', 'teacher of the classics', 'instructor in the rudiments', 'reader in the Classics', 'literary lady', 'secretary' and (more soberly but probably more accurately) 'literate'.[3] In fact, the connotations of female erudition suggested by the epithet γραμματική were what determined Hermione's eventual destination at Girton, then a women-only college with a strong interest in teaching Classics.

The other inscribed mummy recorded from the 1910–11 dig is that of Heron son of Ammonius, the bandages of whose mummy (pl. XXIV, 2) were labelled in ink with a text apparently transcribed by Petrie as Ἥρων Ἀμμωνίου .. λοcοφοροc εὐψύχει (now published as *SB* XVIII 13645)—seemingly the deceased's name and patronym, followed by a damaged epithet or professional designation, and one of the standard funeral valedictions. This information was written across three diagonal bands of Heron's lavish wrappings, of which Petrie observed, 'the diagonal winding of the bandages around the mummy became developed into a complex system; and the triumphs of this decoration seem almost incredibly skilful ... A very fine example ... is that of Heron, which has thirteen layers of different colours.'[4] It is thus likely that Heron came from a prosperous family with disposable wealth. His name perhaps honours the homonymous Thracian rider god, who had shrines at Theadelphia and Magdola not far from Hawara, and is also represented on a wall-painting from Karanis.[5]

In his publication of Heron's inscription, Petrie observed that the word ending]λοcοφοροc before the valediction εὐψύχει,

> 'should be the title or profession, and it is tempting to see in it the Philosophoros or bearer of Philosophia; much as Apollonios at the toll-gate on the Euphrates said that he was accompanied by Sophrosyne, Dikaiosyne, and other virtues (*Philostratos*, *Life of Apollonios* i, xx). It is noteworthy that two [i.e. Heron and Hermione] out of four names preserved to us are of teachers. It seems as if they were retainers of the families, whose names it was thought needful to add because they might be forgotten sooner than those of ancestors.[6]

[1] W. M. F. Petrie, *Roman Portraits and Memphis (IV)* (BSAE and ERA 20; London, 1911), 1.

[2] See J. Quaegebeur in Appendice F to *Pap. Lugd. Bat.* XIX, 232–59. The types and formats of inscriptions found on mummy linen of the Roman Period from Egypt are discussed by M. Thieme and P. W. Pestman in the preceding appendix (pp. 225–31).

[3] For interpretations of Hermione's inscription, see respectively H. G. Liddell and R. Scott, *A Greek–English Lexicon* (9th edition, revised by H. S. Jones, Oxford, 1940), s.v. γραμματικός; M. A. Swindler, *Ancient Painting from the Earliest Times to the Period of Christian Art* (New Haven, 1929), 323; E. G. Turner, *Greek Papyri: An Introduction* (Oxford, 1968), 77 and pl. iii; S. G. Cole, in H. P. Foley (ed.) *Reflections of Women in Antiquity* (New York, 1981), 233. The translation 'literate' is suggested by E. Bowie, in J. Tatum (ed.) *The Search for the Ancient Novel* (Baltimore, 1994), 440, and see R. A. Kaster, *Guardians of Language: The Grammarian and Society in Late Antiquity* (Baltimore, 1986), 454. There is a splendid illustration of Hermione in E. Doxiadis, *The Mysterious Fayum Portraits* (London, 1995), pl. 33.

[4] *Roman Portraits*, 14.

[5] Illustrated in A. K. Bowman, *Egypt after the Pharaohs* (London, 1986), pl. 107.

[6] *Roman Portraits*, 8–9. It is impossible to tell from this publication or from Petrie's Hawara notebooks (now available on microfilm in the Petrie Museum, University College London) whether the mummies of Heron and Hermione came from the same cache. The present whereabouts of Heron's mummy is unknown; I could find no information about it in the distribution lists of finds from Egypt Exploration Society excavations in the Society's archives. It may well have been left behind in Egypt.

However, a closer examination of Petrie's photograph of the writing on Heron's bandages suggests that he was not described as [φι]λοσοφόρος, a word which is unattested and a grammatically improbable formation.[7] Heron's wrappings were inscribed by brush in a fluent, unligatured, rather angular script reminiscent of documentary hands of the late first and early second centuries AD.[8] The most likely reading[9] of the problematic epithet applied to Heron is arrived at by interpreting the high riser of what Petrie thought was the *rho* of [φι]λοσοφόρος as a badly-made *phi*, perhaps written dittographically as the eye of the scribe jumped from the previous letter-group, or corrected from *rho* because of scribal confusion over words with the common termination -οφορος. In this case, one would read [φι]λοσοφο{φο}c, and transcribe the whole docket as Ἥρων Ἀμμωνίου [φι]λόσοφ{οφ}ος εὐψύχει, which could be translated as 'Heron son of Ammonius, *philosophos*, farewell'. How one translates *philosophos* would depend on the age of the deceased, which in the absence of the mummy cannot be determined: 'student of philosophy', 'philosopher', 'lover of wisdom', 'educated man' are all possibilities.

If one is to read the description of Heron as [φι]λόσοφ{οφ}ος, this may shed some further light on the inscription of Ἑρμιόνη γραμματική. φιλόσοφος recalls other epithets applied on funerary commemorations to the (often youthful) dead in praise of their studiousness and devotion to learning, such as φιλόλογος.[10] The expensively prepared mummies of Heron and Hermione suggest that they came from the local elites of the Fayum. But do the epithets applied to them indicate professions, or are they funerary laudations? Inscriptions on some other mummy portraits contain laudatory epithets, such as that of Claudiane from Antinoöpolis,[11] who is given the standard characterization χρηστή, 'worthy', found on grave stelae; on no other portrait inscription is there any kind of professional appellation. While there is a distinction between inscriptions on mummy bands and labels (which often record the profession of the deceased) and those on mummy portraits (which do not), the funerary inscriptions of Hermione and Heron still indicate that they were both educated people, whether or not they utilized their education professionally during their lifetimes. Education was an expensive commodity in the ancient world, and having had access to it was an indicator of high status, just the kind of information that family members might want to record of a deceased relative. In the absence of any parallel for an inscribed mummy portrait with a professional designation, therefore, γραμματική might well be

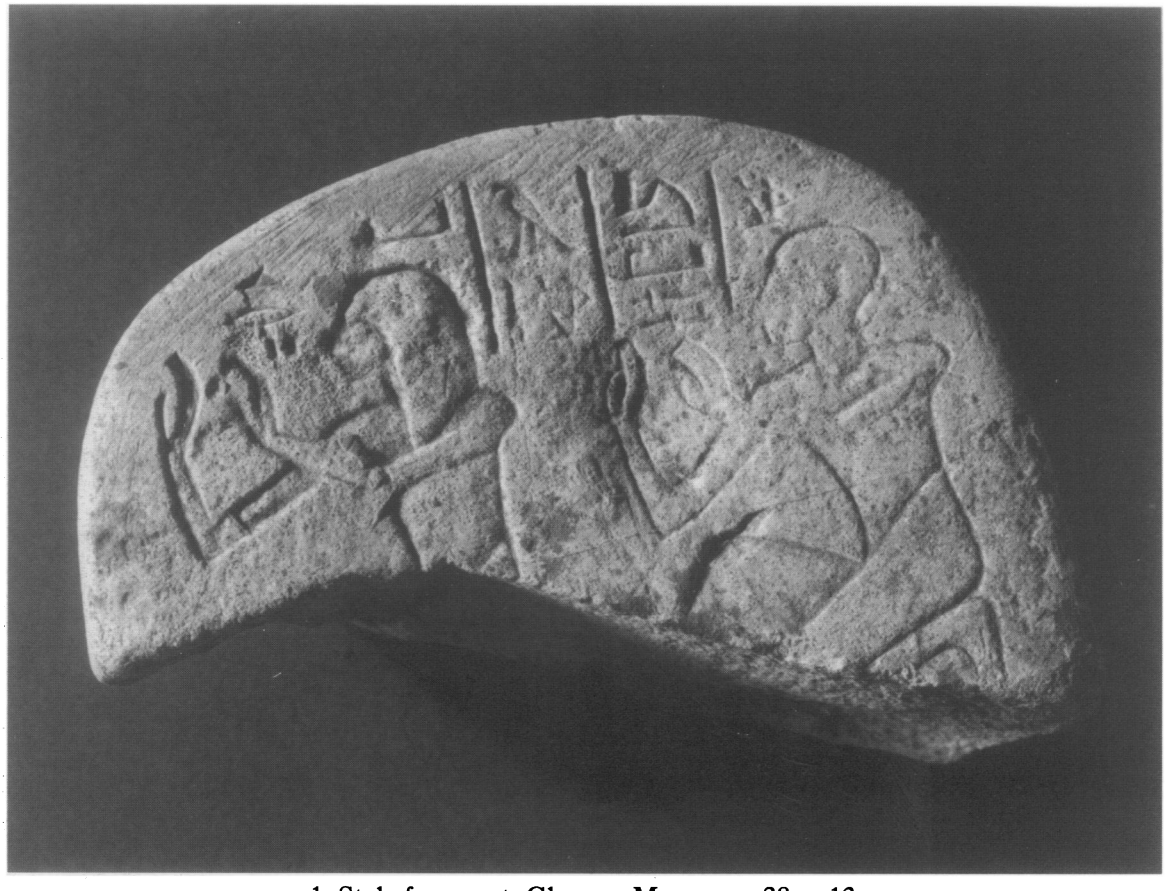
[7] The word does not appear in Liddell and Scott, *Greek Lexicon*, any of the ancient glossaries, or among the words ending in -φόρος in P. Kretschmer and E. Locker, *Rückläufiges Wörterbuch der griechischen Sprache*[2] (Göttingen, 1963), 473–6.

[8] For palaeographical analogues, neither of them very close, see the first hand of *P. Lond.* II 163 (pl. 32) of 88 AD (although more ligatured, it has some very similar letter forms) and *Pap. Lugd. Bat.* XIX 30 (pl. xx), which is undated but probably early second century. These dates accord approximately with the observation of Thieme and Pestman, 'the impression gained is that the inscribed linen from mummies generally dates from the 2nd cent. AD' (*Pap. Lugd. Bat.* XIX, 226).

[9] I originally thought that Petrie's [φι]λοσοφόρος might be read as]ας̣τοφορος, and only one letter needed to be supplied in the damaged area on the left of the inscription to obtain [π]αστοφόρος or *pastophore*, the well-attested priestly profession. However, I now reject this palaeographically and historically (a low-grade temple employee like a *pastophore* would be unlikely to be buried in Heron's luxurious fashion).

[10] See M. Kleijwegt, *Ancient Youth: The Ambiguity of Youth and the Absence of Adolescence in Graeco-Roman Society* (Amsterdam, 1991), 118–19. Funerary epithets beginning with φιλο- are, unsurprisingly, very common, though I have not been able to parallel φιλόσοφος in a specifically funerary context from Egypt. There are numerous others beginning with the same element, for which see B. Boyaval, 'Les épithètes funéraires de Kom Abou Billou', *CdE* 67 (1992), 329, who cites φιλάδελφος, φιλάνθρωπος, φίλευνος, φιλευφρόσυνος, φιλόανδρος, φιλοδεc (= φιλοδέc(ποτος)?), φιλομήτωρ, φιλοπάτριος, φιλοπάτωρ, φιλότεκνος and φιλόφιλος. φιλόσοφος appears on *SB* I 1206, a mummy label from Akhmim: Ἐπαφρᾶς δοῦλος Ἰουλίου Ἰcιδώρου φιλοσόφου.

[11] Now in Dijon, Musée des Beaux-Arts Inv. GA 5, in K. Parlasca, *Repertorio d'arte dell'Egitto greco-romano B I, Ritratti di mummie* (Palermo, 1969), no. 236. I discount the inscription (*SB* XVI 12341) on the mummy portrait of Eutyches, now in the Metropolitan Museum, New York, which identifies him as a freed slave, since this seems to me to be a quite different category of information from recording a profession.



1. Stela fragment, Glasgow Museums, 28au-13
(*Courtesy of Glasgow Museums*)

A SHIELD BEARER AND WARRIOR OF RAMESSIDE TIMES (pp. 218–22)

2. Inscription on the wrappings of the mummy of Heron son of Ammonius (reproduced from Petrie, *Roman Portraits and Memphis (IV)*, pl. x.3)

HERON 'BEARER OF *PHILOSOPHIA*' AND HERMIONE *GRAMMATIKE* (pp. 223–6)

REVIEWS

Ancient Egyptian Kingship. Edited by D. O'Connor and D. P. Silverman, with additional contributions by J. Baines, D. B. Redford, W. J. Murnane and Z. Hawass. Probleme der Ägyptologie 9. 162×245 mm. Pp. 347, ills. Leiden, New York, Cologne, E. J. Brill, 1995. ISSN 0169-9601. ISBN 90 04 10041 5. DFl. 180.

Shakespeare's Richard II confidentally proclaims his affirmation of belief in the divine character of kingship:

> Not all the water in the rough rude sea
> Can wash the balm off from an anointed king;
> The breath of wordly men cannot depose
> The deputy elected by the Lord
> (Act III, Sc. ii. 54–58).

Yet the gulf separating theory and practice could not have been demonstrated in a more dramatic fashion: within a short space of time Richard was deposed and imprisoned, dead and forgotten.

Formally, ancient Egyptian kingship was even more complex than the same institution in medieval England, and the Egyptian king was elevated still higher: he was not just chosen by the gods and acted on their behalf but he also shared the gods' general designation as *nṯr nfr*, 'young (i.e. new or junior) god' (although 'perfect god' is preferred in *Ancient Egyptian Kingship*, hereafter *AEK*). This, however, did not make him their equal. The king monopolized access to the gods and was the Egyptian populace's one and only go-between for much of Egyptian history. Nevertheless, he retains many 'human' characteristics when viewed through our modern eyes (many of these are displayed even by the gods). The ambiguity built into such a dichotomic position has made the advance in the study of ancient Egyptian kingship far from linear, but correct interpretation is fundamental for the understanding of many characteristics of the whole civilization.

Henri Frankfort's (*Kingship and the Gods*) emphasis on the divine character of the king in the late 1940s, and Georges Posener's (*De la divinité du pharaon*) brilliant rebuttal of the extremes of such an approach and his strong defence of the human characteristics of the Egyptian monarch in 1960, were the two milestones in the modern intellectual journey of discovery, but they were markers of the evolution of contemporary thought almost as much as a reflection of the progress in Egyptology. And it may be a sign of our own times that the currently prevalent view, endorsed by *AEK*, sees the Egyptian king as divine while performing the duties of his office, and human at other times (p. xxv of the Introduction). Such a 'part-time' approach strikes me as uncomfortable and the least likely of all the available options, reminiscent of the priestly rota system or modern parallels.

The *AEK* volume edited by D. O'Connor and D. P. Silverman is an important and most welcome contribution to the discussion. Various aspects of Egyptian kingship have been shared as follows: 1. Kingship, definition of culture, and legitimation (pp. 3–47), and 3. Origins of Egyptian kingship (pp. 95–156), were written by John Baines; 2. The nature of Egyptian kingship (pp. 49–92), by D. P. Silverman; 4. The concept of kingship during the Eighteenth Dynasty (pp. 157–84), by D. B. Redford; 5. The kingship of the Nineteenth Dynasty (pp. 185–217), by W. J. Murnane; 6. Programs of the royal funerary complexes of the Fourth Dynasty (pp. 221–62), by Z. Hawass; 7. The royal palace in New Kingdom Egypt (pp. 263–300), by D. B. O'Connor.

There are many acute observations and challenging ideas scattered through the book. One of these, by David Silverman, concerns the erasure of the royal *ka* from the scenes at Luxor during the reign of Akhenaten (p. 72 ff.). Silverman sees the former concept now expressed by the arms

and hands of the Aten, so achieving a more complex identification of the king and his god. This is original, but possibly over-elaboration; could the reason lie in the uniqueness and exclusivity of both the king, as *wr-n-Rr*, and the Aten, which brooked no 'doubles'? John Baines's remarks concerning possible manipulation of the annalistic inundation records (pp. 130–1) provide some food for thought, but who was being deceived? William Murnane's analysis of the royal succession during the transition from the Eighteenth to the Nineteenth Dynasties (p. 185 ff.) should not be missed by any student of the history of the period; all the same, I find much anachronistic modern thinking in his analysis (the editors' pen seems to have been unkind to him, e.g. in the middle of p. 207). Zahi Hawass's suggestion that the Giza Sphinx 'represents Khafre, as Horus, giving offerings with his two paws to Khufu, as the sun-god' (p. 227), is new and interesting, but it also creates many additional problems, and further arguments are required in order to assess it properly. David O'Connor's discussion of the location of Eighteenth Dynasty royal palaces at Thebes (p. 270 ff.) is inspired, but I am only partly convinced by it. His initial thesis that 'there was only one principal palace, a "Regierungspalast", or governmental palace', is, in my opinion, less than safe, especially if this is sought at Thebes.

The contributors have succeeded in presenting an interlocking all-round picture of Egyptian kingship, although they did not avoid inconsistency completely. The occasional insistence on unnecessary jargon strikes a jarring chord from time to time (here, Donald Redford's description of how Egyptologists tackle 'the apparent contradictions in ancient Egyptian religious expression', p. 162, is delightfully mischievous). Some of the statements court controversy. By way of example, I refer the reader to Ramses II's lack of 'omniscience' at Kadesh on p. 51 ff. (this seems inspired by Christian doctrine and is unnecessary in an Egyptian context). Then there is the view expressed on p. 60 that 'most of the population appears to have been involved in the continued royal funerary activities and the associated rituals'. I suspect that proportionately about as many Egyptians were employed in this manner as there are people in the United Kingdom who regularly attend tea parties on the lawn of Buckingham Palace. Or the assertion that the straight lines of Egyptian mud-brick 'expressed order, becoming a vital element in royal and elite ideology' on p. 109; I wonder whether, had Egyptian architecture been based on a circular plan, one would have argued that this expressed the cyclical nature of Egyptian history. The suggestion on p. 198 that Seti I's reasons behind his military campaigns might have been the realization that 'there is nothing like a foreign war, and especially a successful war, to distract attention from internal problems and build support for the government' is based on thinking shaped by circumstances which were not present in ancient Egypt. The view expressed on p. 250 that the burial chamber of Khufu's satellite pyramid 'was the changing room for the *sed*-festival' assumes that the *sed*-festivals took place within pyramid-complexes; this has never been proved and is very unlikely. The concept of royal 'dynasty', crucial to any consideration of ancient Egyptian kingship, is not discussed, an omission which is hard to understand.

There is no doubt that *AEK* is a book well worth reading. This review can, unfortunately, be only a small note in the margin of a large discussion, and my remarks amount to little more than opportunist selective sniping. I hope that somebody will take up the challenge more seriously; the editors and authors must be congratulated on creating the setting for it.

The book grew out of a symposium organized by Barbara Stone, the Curator of Collections in Denver, on the occasion of the exhibition *Ramesses II: The Great Pharaoh and His Times*, and so it is appropriate to conclude by thanking her for providing the inspiration for a stimulating publication.

JAROMIR MALEK

Das Kind im Alten Ägypten. By ERIKA FEUCHT. 165 × 235 mm. Pp. 610, figs. 53 in text. Frankfurt and New York, Campus Verlag, 1995. ISBN 3 593 35277 X. Price DM 98.

A famous anecdote relates that three men, a Frenchman, an Englishman, and a German, were each commissioned to write a book on camels. After three months the Frenchman produced a slim, elegant, soft-cover volume entitled 'L'amour du chameau'. Three months later the English-

man presented a solid, hard-cover book called 'Travels by Camel'. The German took a few years, but then his study appeared in three bulky volumes, each comprising hundreds of pages, with a multitude of footnotes, termed simply 'Das Kamel'. All that one could ever want to know about the beast had been recorded. The work had merely one shortcoming: nobody would ever be induced to read it for pleasure.

It was this story that impressed itself irresistibly on my mind when I was halfway through the book here reviewed. Over six hundred pages, with just over two thousand nine hundred footnotes, all solid knowledge, is somewhat overwhelming. Is it purely by chance that the simple, eclectic volume, intended for the general reader, which my wife and I published a few years ago, received the title *Growing Up in Ancient Egypt*? While we chose subjects we thought would be interesting for the reader, Feucht deals with every conceivable aspect, so that it almost comes as a relief to read (pp. 19–20) that toys will not be discussed. The reason she gives is that it would mean merely a compilation of material that would not add to our understanding of the position of children in ancient Egypt. Whether this is quite correct can be questioned, but it certainly saves the reader one more lengthy chapter.

As it is, the study consists of ten chapters, namely: 1) family, birth, and death, with several related subjects; 2) relationship between parents and children; 3) education and the start of a career; 4) work by children; 5) participation in the life of adults; 6) the mental attitude to children; 7) the child's role in the cult of its parents and grandparents; 8) representations of parents and children; 9) representations of children alone; 10) Egyptian words for 'child'. Chapter 11 contains a brief summary.

The chapters are divided into parts, these into sections, these again in some cases into subsections. The classification is indicated by series of figures, e.g. 8.1.1.1: couple with three children; 8.1.1.2: couple with two children; 8.1.1.3: couple with one child; 8.1.1.4: a single parent with a child. Such a numerical system enables the reader to locate quickly the place where a particular subject is discussed, and also to discover subjects which one would perhaps not expect here. An example of the latter is that of the liability of members of a family for the offences of the father, divided into: offences against the king (2.3.6.1), offences in the civil sphere (2.3.6.2), and liability in cases of desertion (2.3.6.3). With the help of the extensive table of contents such matters are easily located.

As the author sets forth in her preface, the study was in principle completed in 1981. Although it has been revised and enlarged during the succeeding years, it still shows traces of its date of origin in the omission of recent literature. As a perhaps unexpected example, unimportant in itself, I refer to p. 442, where the role of the royal children in the *sed*-festival is discussed. A mention of Jocelyn Gohary's *Akhenaten's Sed-Festival at Karnak* (London, 1992) would now be appropriate. There are other such gaps in the documentation, in themselves irrelevant, but conspicuous against the background of the extensive references to older publications.

The study covers the whole of Egyptian history from the early Old Kingdom to the Graeco-Roman Period, with a certain amount of stress on later sources. The reason is the author's conviction of a strong continuity through the ages (see p. 17), so that later texts can be used to shed light on earlier circumstances. How far that is correct, for instance, in matters such as the position of women in society or the absence of evidence for a wedding in Pharaonic times (see p. 31 ff.), is open to discussion. Particularly in this first chapter there is much that one would like to discuss, but this would exceed the limits of a review.

In general, one gains the impression that the author states and attempts to substantiate points which are self-evident. In her summary she writes (p. 560) that the child should trust, honour, and love his mother. It would be interesting if the opposite was ever said, but as it is, it hardly merits a sentence. On p. 193 ff. several quotations from the wisdom literature and religious texts are presented in order to demonstrate that in Egypt fathers were supposed to care for their children, which seems rather obvious. On the other hand, the author states, after Hornung (p. 139), that in ancient Egypt love always went from higher to lower, from the god to the king, from man to wife (sic!). Hence we rarely find the love of a child for his parent expressed. One would like to see such an interesting remark elaborated, but it is stated on a par with quite trivial facts. In this connection it is surprising that in the summary (p. 561) the author seems to have forgotten

what she wrote before, arguing that a child should offer to its parents 'love, respect, and obedience'. Does love really belong in this series?

Of course, it is impossible to check all the nearly three thousand notes. One expects them to be mostly correct; a rare slip among so many is quite acceptable. The more disconcerting is it to discover, therefore, that there seem to be several mistakes. Understandably, a reviewer turns to those aspects he knows best, in the present case, to Deir el-Medina texts. On p. 115, note 550, an article by Černý is quoted, which should contain a translation on its p. 184 (should be p. 186) of a text called 'Nr. 49.866 recto, Z. II'. This is actually O. Cairo JE 49866 rt., line 11, and, what seems to have escaped the author is that Černý later published it as O. Cairo 25521. In the text of her book, to which this note 550 refers, Feucht translates 'bei seinem Fest mit seiner Tochter'. Actually, what is here rendered as 'mit' is a lacuna in the ostracon. Černý, more carefully, translated (op. cit. 191) '[avec?] sa fille'. What could this mean? What preposition could have been lost? The photograph shows that the space is just large enough to accommodate a single sign, most probably an *n*, which rather points to the translation 'his feast of his daughter'. Whether a birthday feast was meant is quite uncertain.

On p. 126 the author states that in Amarna and in Deir el-Medina dead newborn babies were buried in cellars in the main room of the house. She refers (note 626) to two publications, the first of which (by Florence Friedman) in its turn mentions as the source merely the second publication, by Badawy. It is, therefore, no independent proof. Indeed, Badawy states as a fact that this type of burial occurred in the workmen's village, without citing any reference. Since I was suspicious, I went over Bruyère's report of his excavations of the houses at Deir el-Medina. In a few instances he mentions earlier burial places being converted into cellars, and once (House C III) that the cellar was used in Ptolemaic times as a family tomb. Nowhere, however, is a baby burial at such a place recorded—the burial in House SE VI was not found in the cellar. Later excavations by Bonnet and Valbelle have brought to light a child's interment under the enclosure wall (*BIFAO* 76 (1976), 328–31), but that seems to be all. I cannot find any proof for Badawy's sweeping statement. Obviously, Feucht did not check it.

Clearly, these are mere quibbles, but one is inclined to ask in how many instances, if one attempts to verify the author's statements, do they appear to be badly founded? On p. 343 she mentions (note 1708) two names from O. DeM. 209. The first one she reads as *Jsw-nb.f*, whereas it is clearly the well-known workman *Ḥsy-sw-nb.f*. There follows: 'weil *Jtp* gebar', as a translation of *iw ms Ḥtp*... Why she reads *Jtp* for what Černý, hesitantly, read as *Ḥtp*... escapes me. Černý also thought that the name was longer than *Ḥtp*.

On the same p. 343, in notes 1709 and 1710, O. Cairo 25572 is quoted. What went awry here I did not discover, but this ostracon does not contain what Feucht states in the text. O. Cairo 25503, also quoted in note 1709, she sees as a proof that a workman was absent because his daughter was ill, although all that is left in the pertinent line of this fragment are the words *ṯzy.f šri*. Note 1711 refers to O. BM. 5634, in which the words *sꜣt.f*  (*ḥsmn* ?) occur four times. I venture to doubt that this simply means 'his daughter was ill'; see my article in *SAK* 8 (1980), 141 ff. Note 1713 refers to O. Cairo 25516, of which the recto is a record of lamps. On the verso I can only find that Hesysunebef (see above) had a free day because *ṯzy.f ḥmt msy*, which is, fortunately for him, not exactly the same as 'seine Tochter starb'.

In note 1923 (p. 385) pBerlin P 10627 is quoted. Despite the second P this is an ostracon, published by Gardiner in *Hieratische Papyrus Berlin*, III (Leipzig, 1911), pl. 33. The text is much discussed, e.g. by Guilmot in *CdE* 40 (1965), 235–48. Recently it has been translated by Wente in his *Letters from Ancient Egypt* (Atlanta, 1990), No. 206. A reference to Erman's article in *ZÄS* 42 (1905) is slightly out of date.

The author also misses the present location of some stelae. That of Irinefer (p. 458 with note 2242) is now Louvre E 12964, that of Nakhtmin (p. 459, with note 2245) is now Turin 50011. The number in note 2244 is strange; probably Turin 1639 refers to Schiaparelli's catalogue, 101 to that of Orcurti. In Werbrouck's *Les pleureuses* only its lower part is depicted.

Perhaps our conclusion should be that the author is certainly well at home in the wisdom literature and in religious texts, but that her knowledge of Deir el-Medina and its ostraca, which

constitute such an important source for our knowledge of daily life, is not quite adequate. For her general argument that hardly matters. In that, one can mostly agree with her, and where one does not it is a question of interpretation. In her section 6.6 (p. 385), for instance, she states that the Egyptians had an understanding of youth, accepting its ignorance and need of learning. She quotes some texts which seem to confirm this, the most outspoken being Papyrus Insinger. That this is a very late source does not trouble her, believing as she does in the constancy of the Egyptian civilization. It is almost impossible to falsify such a general statement. Did the Egyptians really accept that children by their very nature could not behave as they should do later in life, or did they treat them as, admittedly not yet complete, young adults? I am inclined to suggest the latter.

A plea such as that of Any's son Khonsuhotep in the last part of Any's *Instruction* is exceptional, the discussion between father and son being unique in Egypt's literature. It seems to me that, like Any, the average Egyptian parent did not accept that a child was unable to behave 'normally'. This is one of the points on which one would like to begin a discussion with Prof. Feucht. Perhaps the greatest praise one could confer upon this book is that it brings together the evidence from which a debate on such crucial points should commence. For without doubt the study here reviewed will become the handbook on the subject for years to come.

JAC. J. JANSSEN

Ancient Egyptian Stone Vessels: Materials and Forms. By BARBARA G. ASTON. 290 × 195 mm. Pp. 196, pls. 16. Heidelberg, Heidelberger Orientverlag, 1994. ISBN 3 927552 12 7. Price not stated.

Egyptian Stone Vessels: Khian through Tuthmosis IV. By CHRISTINE LILYQUIST. 272 × 210 mm. Pp. 79, pls. 43. New York, The Metropolitan Museum of Art, 1996. ISBN 0 87099 760 2. Price $25.00.

When Egypt was only a satrapy in the Achaemenid empire of the sixth and fifth centuries BC, there appears to have developed a vogue among the Persian elite for the acquisition of inscribed Egyptian stone vessels. Examples have been found as far afield as the western staircase of the Mausoleum at Halicarnassus and an Achaemenid site at Orsk in southern Russia. It is not clear whether these vessels became popular because they were used to hold the regular supplies of Nile water for the Great King's table (which the Egyptians are said to have been obliged to send as tribute), but it seems likely that the Persians regarded such delicate stoneworking as one of the more remarkable achievements of Egyptian craftsmen. The appreciation by non-Egyptians of Egyptian excellence in the carving of stone vessels can, of course, be traced much further back, and instances of the diaspora of stone vessels outside Egypt include the jar of Pepi I found on Crete, the vessels inscribed with the name of the Hyksos ruler Khian which were found at Boghazköy and Knossos, and the stone vessels excavated from the tombs of the rulers of Byblos in the late Bronze Age (the latter proving extremely useful in the process of synchronizing the chronologies of Egypt and the Levant).

Like building in stone masonry, the carving of stone vessels reached a peak comparatively early in ancient Egypt, and then bcame firmly enshrined as one of the quintessential expressions of Egyptian civilization, with its origins stretching back deep into the Predynastic Period. The appreciation of these artefacts by outsiders has lasted into modern times, when Egyptian stone vessels, especially those combining a purity of form with finely incised hieroglyphs (as in the case of many of those catalogued in Christine Lilyquist's *Egyptian Stone Vessels: Khian through Tuthmosis IV*), are much coveted by art collectors. On the other hand, until the publication of Barbara Aston's *Ancient Egyptian Stone Vessels*, the only general publications on this topic were von Bissing's 1907 catalogue of stone vessels in the Cairo Museum[1] and Petrie's typological study

[1]F. W. von Bissing, *Steingefäße* (CG; Vienna, 1907).

of stone and metal vases,[2] published in 1937. A few other publications have appeared in recent years, but all these, like Lilyquist's monograph, have concentrated on specific periods.[3]

Both Aston and Liliquist bemoan the lack of any exhaustive and authoritative survey of the history of materials and styles of stone vessels; each then goes on to suggest that their books will go some way to fill this gap. What is interesting is that two books with such apparently similar objectives should be so fundamentally different in their approaches and contents. Lilyquist catalogues a range of vessels from royal contexts during the Second Intermediate Period and Eighteenth Dynasty, while Aston sets out to synthesize the available evidence for the observable changes in material and style over the entire period that stone vessels were being produced. Apart from the question of chronological scope, however, the most basic difference between the two books is that Aston works essentially archaeologically and geologically from the raw materials upwards, dealing primarily with general discussions of the sources and nature of vessels in different times and places, whereas Lilyquist is much more museological in her approach, selecting a very specific range of artefacts and providing brief descriptions of their individual characteristics (such as inscriptions and provenance). In a sense these two approaches are complementary rather than conflicting, but they inadvertently show how the museum-oriented approach may often stress the idiosyncracies and eccentricities of ancient material culture, while more archaeological techniques of analysis tend towards the definition of broad trends and patterns that transcend the individual object.

Barbara Aston's study of the materials and forms of ancient Egyptian stone vessels is based on her doctoral dissertation in which she combined field survey and petrographic analysis to produce a thorough study of changing materials and forms. It is appropriate that she begins her book with a reference to the systematic work of Alfred Lucas,[4] since her own research is characterized by clear scientific procedures and the kind of straightforward descriptive methodology for which Lucas is best known. As an Egyptologist with a strong background in geology, her approach to the characterization and analysis of Egyptian stone vessels from the Predynastic to the Roman Period combines a knowledge of the archaeological and ancient textual sources with an awareness of the many pitfalls of geological terminology. Like James Harrell[5] and Dietrich and Rosemarie Klemm,[6] she takes a distinctly crusading approach to the identification of stone types, including a useful discussion of common misconceptions in the final chapter of the book.

Christine Lilyquist's introductory chapter includes a section on materials in which she describes her difficulties, as a non-geologist, in applying Aston's terminology to the vessels included in her catalogue. Until all vessels in museum collections have been analysed by geologists, it is difficult to see how the current terminological problems can be solved. As Lilyquist points out, 'An archaeologist often lacks access to artifacts at the time of publication and in any event is more used to looking at general appearance than at inclusions, crystal formation, or grain size' (p. 13). Although Egyptologists might be accused of simply lacking the motivation, or even the inclination, to sharpen up their often vague and contradictory categories of stone, there are some grounds for agreeing with Lilyquist's implication that, already required to master a variety of skills within the ever-expanding subjects of Egyptian archaeology and philology, they can hardly be expected to acquire sophisticated geological training overnight. And

[2]W. M. F. Petrie, *The Funeral Furniture of Egypt – Stone and Metal Vases* (BSAE 59; London, 1937).

[3]Notably G. A. Reisner, *Mycerinus: The Temples of the Third Pyramid at Giza* (Cambridge MA, 1931), 130–201; A. El-Khouli, *Egyptian Stone Vessels: Predynastic Period to Dynasty III: Typology and Analysis*, 3 vols (Mainz, 1978); A. El-Khouli et al., *Stone Vessels, Pottery and Sealings from the Tomb of Tutʿankhamūn* (Oxford, 1993).

[4]A. Lucas, *Ancient Egyptian Materials and Industries*[4], rev. J. R. Harris (London, 1962).

[5]J. A. Harrell, 'An Inventory of Ancient Egyptian Quarries', *NARCE* 146 (1989), 1–7; id., 'Misuse of the Term "Alabaster" in Egyptology', *GM* 119 (1990) 37–42; id., 'Ancient Egyptian Limestone Quarries – A Petrological Survey', *Archaeometry* 34 (1992), 195–212.

[6]D. and R. Klemm, 'Herkunftsbestimmung altägyptischen Steinmaterials', *SAK* 7 (1979), 103–40; D. Klemm, R. Klemm and L. Steclaci, 'Die pharaonischen Steinbrüche des Silifizierten Sandsteins in Ägypten und die Herkunft der Memnon-Kolosse', *MDAIK* 40 (1984), 207–20; D. and R. Klemm, *Steine und Steinbrüche im alten Ägypten* (Berlin, 1993).

this is the nub of the problem: many of the geological errors and misconceptions in the Egyptological study of stone artefacts result purely from archaeologists' and museum curators' lack of access to geological knowledge. In other words, the problem is empirical rather than terminological.

If it were simply a question of agreeing to describe Egyptian alabaster as travertine or black granite as diorite or gabbro, then the transformation would be relatively easy (although experience shows that even widely accepted changes in terminology can take a long time to permeate the literature). However, what Aston requires—and Lilyquist only partially delivers—is the geological re-evaluation of most of the stone vessels currently in museums or excavation magazines, to say nothing of the attempt to rewrite countless excavation reports where the excavator has used idiosyncratic personal systems of geological categorization (e.g. Petrie's use of the term 'marble' to refer to coloured limestones).[7]

A parallel can usefully be drawn with the study of Egyptian pottery, which has, in the past fifteen years or so, moved inexorably (and beneficially) from the age of subjective description to a more rigorous era of thin-sectioning and objective analysis, including the application of the 'Vienna system' of fabric description as well as the use of statistical sampling and other methods of quantification.[8] If the study of ceramics can be so radically changed, why does the identification and analysis of stone types lag so far behind? One crucial difference between the two is that ceramics have increasingly become the sole preserve of those Egyptologists who choose to specialize in ceramology, whereas the need to identify stone arises in a number of different areas of study, from the technological analysis of functional objects, such as quern-stones or door-sockets, to the aesthetic appraisal of royal statuary and early prestige goods such as palettes and mace-heads. While there is no reason why a similar subdiscipline of geological Egyptologists should not emerge, in practice the knowledge of stone types would need to permeate the subject much more extensively than has tended to be the case with pottery.

Whatever happens in terms of the future identification of stone in Egyptology, these two books have both made essential contributions to the study of stone vessels. Lilyquist has provided a much-needed assessment of vessels deriving from royal tombs (or inscribed with royal names) in the seventeenth to fifteenth centuries BC. Whereas the majority of earlier studies tended to concentrate on vessels of the Early Dynastic Period, Lilyquist's catalogue, together with the recent Griffith Institute publication of vessels from the tomb of Tutankhamun,[9] helps to redress the balance as far as later periods are concerned. The value of Aston's study, on the other hand, lies much more in the area of overall chronology and typology, creating a much more rigorous context from which it is to be hoped that future catalogues will benefit.

Both books are well written and clearly structured but it is a great pity that neither was provided with an index.

IAN SHAW

Stone Vessels, Pottery and Sealings from the Tomb of Tutʿankhamūn. By ALI ABDEL RAHMAN HASSANAIN EL-KHOULI, ROSTISLAV HOLTHOER, COLIN A. HOPE and OLAF E. KAPER. 220 × 290 mm. Pp. xviii + 177, figs. 16, pls. 50. Oxford, Griffith Institute, 1993. ISBN 0 900416 637. Price £60.

Continuing the publication of material from the tomb of Tutankhamun, this book brings together four disparate studies within the covers of a single volume. Three of these—the odd one out being Olaf Kaper's study of the door sealings—were originally commissioned for the now

[7] W. M. F. Petrie, *Prehistoric Egypt* (London, 1920).

[8] E.g. J. D. Bourriau, *Umm el-Gaʿab: Pottery from the Nile Valley Before the Arab Conquest* (Cambridge, 1981); D. Arnold and J. D. Bourriau, *An Introduction to Ancient Egyptian Pottery* (Mainz, 1993).

[9] El-Khouli et al., *Stone Vessels* (see n. 3).

defunct *Tutankhamun's Tomb Series*, and, as is to be expected, the contributions of the four authors differ widely in their approach to the material and in the depth of their study. Essentially, both Ali el-Khouli, writing on the stone vessels, and the late Rostislav Holthoer, writing on the pottery vessels, are content to reproduce Carter's notes on these objects without much additional commentary, whilst Colin Hope, writing on the jar seals, and Olaf Kaper have chosen to give a much more detailed academic study of their particular objects.

Ali el-Khouli's catalogue comprises 68 pieces (62 complete vessels and additional fragments), but it is a pity that the ornamental stone vases were deliberately excluded. With the exception of the situla, vessel 65, modern line drawings with sections, specially redrawn in the Cairo Museum, are included for each piece, and these are found on figs. C–H, J–K (fig. I does not exist). In addition, clear photographs of most of the vessels are found on pls. 11–25, but individual photographs of vessels 5, 6, 15, 16 and 58, though credited to Ali el-Khouli, do not actually appear in the book. Four different scales (1:1, 1:3, 1:6 and 1:9) are used for the line drawings, often, illogically, on the same figure, which is not helpful in gaining an overall impression of the material. Over half the stone vessels considered are very large (26–67 cm tall) whilst seven of them are miniature vessels. Placing vessels 34 and 35, both approximately 2–3 cm tall, together with vessels 32 and 33, which are ten times taller, is rather misleading. Moreover, whilst the drawings appear very professional, they are not entirely accurate. Vessels 15, 16, 24, 25, 28, 30, 31 and 39 were not on display in January 1996 and have not been seen by us, but as concerns the remainder, the following observations were readily apparent. Vessel 4 should have more concave sides, similar to 10; nos. 21 and 23 have a bevelled aperture, in order to hold a stopper, similar to 22; the base of no. 42 is more rounded, as can be seen in pl. 21a; no. 43 has no groove in the underside of the base, but rather, has a flat base with a projection in the middle; the handle of no. 48 is drawn at the wrong angle, as can be seen from the photograph pl. 20a; the handle join of no. 50 projects at the bottom, as in no. 53; no. 51 has a double ribbed rim like no. 26; the carved 'binding' on the neck of no. 54 has a middle line like that of no. 43; the two ringstand bases of no. 56 should be closer together, and, contra el-Khouli, are not cemented to the double vessel, but rather, the whole double vessel is carved in one piece; the base of no. 60 is flatter; and the inner profile of the top of the strainer top, no. 61, should be vertical.

The criteria for assigning vessels to a particular shape class are, unfortunately, not given, and this even causes problems for the author, since, despite his placing of vessels 41–43 in his section VB (jars with handles), he cheerily admits that they could also be classed as amphorae (p. 27, n. 17). No. 43 is nearly the same as no. 54, although the latter is classed as an amphora. The base of no. 43 is missing, but can it not be linked with no. 14? 'Bottles' seems to include shouldered, ovoid and bag-shaped, tall and medium types. Any organisation within the typological classes also seems to be lacking. The small and medium sized cylindrical vessels 4–13 are not arranged in any discernible order. Current convention would suggest an arrangement from most open to most closed forms.

Some unusual terminology is employed by el-Khouli; thus, a handle with upper and lower points of attachment, normally termed a 'vertical' handle, and so described in the pottery section, is here termed 'horizontal' whilst the word 'bowl' is used for the 'body' of a vessel.

Ali el-Khouli notes that, whereas vessels 19, 39, 42 and 51 are made of calcite, their stoppers or lids are made of limestone. While this is true, he omits to mention that the stoppers and lids associated with vessels 22, 27, 32, 45, 49, 50, 53, 54 and 55 are also made of limestone. Indeed, the lid of no. 43 appears to be the only one made, like the vessel itself, out of travertine ('calcite').

A number of confusing typographical errors were noted. The exhibition numbers of vessels 4 and 13, as currently displayed, are reversed. The JE number of vessel 9 is JE 62158, not JE 62159. On p. 10, vessel 14, for 'Pl 14c' read 'Pl 13b'; in the description of vessel 15, at least one line of text is missing from the bottom of the page. The entry for vessel 38 has become slightly garbled. Under 'Position when found', the phrase 'except that the rim is...' should be moved to the line below, following 'Description: As for 37,...' Likewise, entries for vessels 34 and 35 have become somewhat confused. The drawings of vessels 34 and 35 on figure F are reversed and the 'material' and 'dimensions' data listed under no. 34 belong with no. 35.

It is interesting to note that many of the vessels provided for Tutankhamun's tomb equipment were old ones. Nine at least (nos. 19, 20, 22, 23, 25, 28, 43, 53 and 55) of the vessels were broken and repaired, a fact touched on by el-Khouli in his introduction. Four bear inscriptions of earlier kings: Tuthmosis III (nos. 19, 55) and Amenophis III (nos. 49, 53), while three more exhibit traces of inscriptions which are so thoroughly erased as to be illegible. Five vessels have been modified by the removal of handles or rims (nos. 24, 26, 32, 41 and 51), and in the case of nos. 26 and 51 a new rim piece has been added. Overall, however, although perhaps not as well-organised or as accurate as one might like, this section does provide a basic, essential presentation of the material.

Rostislav Holthoer's section provides the first modern study of closely dated pottery from the Valley of the Kings, and, following Winlock's report on the *Materials Used at the Embalming of King Tut-ʿAnkh-Amun* (New York, 1941), only the second such report. It is unfortunate, therefore, that it is so poorly done. To use this study properly one needs Holthoer's *New Kingdom Pharaonic Sites. The Pottery* (Scandinavian Joint Expedition to Sudanese Nubia 5.1; Stockholm, 1977), and Černý's *Hieratic Inscriptions from the Tomb of Tutʿankhamūn* (Oxford, 1965), within easy reach. The pottery is described in terms of its shape, individual components and ware only in Holthoer's own classification scheme outlined in his SJE volume, which, unfortunately, is not reproduced in the present volume. Indeed, if one should read this study without Holthoer's earlier publication, then such references as 'Type of handles: Vul 2. Ware: W4.01' are totally meaningless since these codes are not explained within the confines of the book under review. Similarly, references to the hieratic dockets on many of the pots are given only as page references to Černý's volume, when surely the translation could also have been given in this study (as indeed they are for the relevant pots in Hope's section which follows). However, since there seems to be an inherent, and, in the reviewers' opinion, reprehensible, trend within Egyptology to divorce pottery dockets from the pots on which they were inscribed, this is perhaps not surprising. The pottery drawings on figs. L–Q, which, according to information indicated on p. xv, were all either redrawn from Carter's field sketches or drawn from inspection of the originals, range from downright misleading at worst to decidedly poor at best, and one wonders why the pottery was not redrawn in the museum at the same time as the stone vessels. In addition it should also be noted that on fig. Q, the vessels on the second and third lines have been misnumbered; for nos. 71–74 read 72–75.

Cursory examination of the pots as they are now on display in Cairo reveals numerous points that should be noted. On p. 43, Holthoer points out that most of the amphorae appear to have been made from variants of Marl D. In the reviewers' opinion, most of these vessels are made from Marl F, which would appear to originate in the Eastern Delta or Sinai region (?) since it is most common at Tell el-Dabʿa and Qantir. It may be equated with fabric H14 at Saqqara/Memphis, where it is also thought to be related to the Marl D group (cf. J. Bourriau and P. Nicholson, *JEA* 78 (1992), 51, a clay which one of us has subsequently termed Marl F: D. Aston, *Qantir* I, in press). In this sense, of the objects on display in the Cairo Museum, the amphorae nos. 1, 2, 4–7, 10, 12–15, 22 and 24 are made of an uncoated Marl F, whilst only no. 3 is of typical Marl D, cream slipped. (The remaining fragmentary pieces listed by Holthoer are not on display.)

The following comments relate to individual pots. In the description of amphora no. 1, the broken handle is only partly missing, whilst the supposed traces of a secondary repair were not visible to us. Amphorae nos. 2 and 4 have type 2 bases (as is indeed clear from the photographs, pls. 26, 30–1). As displayed in 1995, amphora 8 is not exhibition no. 1686; 1686 is now amphora no. 10, not 1689 (amphora 8 is not on display). The rim of amphora 10 is of type B3 (lip rim). Amphora 12 is Cairo JE 62307. Amphora 13 is not Spec. Reg 503, but 502, and currently bears the exhibition number 1690. The base is clearly made in a mould and not shaped by hand. Amphora 14 is not only 'probably similar to 13', but is definitely similar, and clearly of type AO 1/IVG/o/l-m with a rim of type B3 (lip rim), handle types Vul 2 and base type 2, and is currently on display between exhibition numbers 1306 and 1681. Amphora 16 is not currently exhibition no. 1690, but is not exhibited. Amphora 22 *is* Cairo JE 62314 and not 62315 (which is Holthoer's no. 13), and thus Černý's JE number is correct. As with amphora 14, amphora 22 is similar in

all respects to amphora 13 and is clearly, not only 'probably', of type AO 1/IVG/o/l-m with a rim of type B3 (lip rim), handle types Vul 2 and base type 2, and is currently on display. Amphora 24 is currently exhibition no. 1677, not 1687.

The small globular jars nos. 27–35 are stated by Holthoer to be of Nile C, though they appear to us to be of Nile B2. The jar no. 30 is Cairo JE 62287, not 62289. The suggestion by Holthoer that Černý's commentary for vessel 32 is wrong makes no sense to us. Holthoer does not explain what is wrong and, moreover, Černý only lists the contents for this pot. The small amphora 36 is not made of Marl B or C, but, like the squat jug 37, of Marl D which was cream coated and burnished, although the surface is now rather worn. The wide mouthed globular jar 38 can surely not be described as a 'crater' and there appear to be no 'smoothed cord and basket impressions on the lower body,' but rather, scraping marks from the trimming of the base. The ovoid jar 39 is exhibition no. 1223 (SR 499), and the decoration consists of a blue painted ware on a cream (not yellow) slip. Only two complete and one fragment of the 'attenuated wine jars' nos. 41–48 are on display. Of those that are, nos. 47 and 48 are clearly of Marl D, cream slipped and burnished, whilst no. 43 would appear to be of Marl F.

The *ḥs*- and *nmst*-vases nos. 49–52 are not 'polychrome'—which, following Hope, is generally used by Egyptologists to refer to post-fired decoration—but rather blue painted with painted designs in red, black and blue. Holthoer's view that they bore painted patterns in yellow, black and blue is mistaken; the use of yellow was never common, and he has confused the underlying cream/pink slip with added yellow paint. Similarly the view that 'when the decoration was applied, the red bands were left plain for other colour patterns' is erroneous. The blue was applied only over an underlying cream/pink slip and the red bands were clearly designed to be simply red bands. As stated, vessel 50 is not similar to no. 49 in decoration since the central decorative bands differ. On the *ḥs*-vase 49 the central band of decoration consists of a black band flanked by two blue ones, whilst the black one has been overpainted with blue finger-applied dots. In the *ḥs*-vase 50 this central pattern consists of a single broad blue band overpainted with seven thin horizontal black lines. On the *nmst*-vase 52 the so-called 'garland ornament' is a frieze of blue lotus petals.

The miniature dishes 53–71 would appear to be of Nile B2 and call for little comment, though no. 55 is only red slipped on the exterior. Similarly the cups, bowls, saucers and plates, nos. 72–77, would also appear to be of Nile B2 rather than Nile C as stated. Vessel 72, more a dish than a cup, is not really 'red coated' but uncoated with a red slipped rim. The large plate 74 bears a dark red slip on the exterior and on the interior from the rim to an even depth of approximately 7–8 cm. The outside of the rim is not 'nicked for ornamentation', but bears an uppermost line of cord impressions, evidently deriving from rope which may have been used both for decorative effect but also to stop the pot falling apart while drying. The remainder of this section, comprising stoppers to the *ḥs*- and *nmst*-vases, 'clay troughs' and various concordances, calls for little comment, though it should be noted that the concordances are not complete.

From the pottery it is a relief to turn to Colin Hope's study of the jar sealings, which are grouped according to the type of vessel they close. Each seal has clearly been examined by the author and commented on at length. Hope divides them into three basic types, 'cap sealings', 'domed sealings' and 'cylindrical sealings', each of which is clearly described and illustrated. Each of the stamps found on the jar sealings is shown, and Hope has been able to identify four types, his nos. iv, xx, xxv and xxvi, which were previously unrecognised by either Carter or Gardiner. After a full catalogue, the chapter ends with an excellent discussion of the reuse of various vessels and the range of commodities mentioned in the seals. In view of the excellence of this chapter, it is perhaps a little churlish to point out that the captions for plate 37a and 37b have been transposed, and that the small globular jar mentioned in the caption to 37a (*sic*) is Holthoer 28 and not Holthoer 37.

This section is followed by Olaf Kaper's study of the door and object sealings. As is well known, eight types of door seals were used in the tomb: seven, types A–G, at the original closure, and another, type H, when it was resealed. Each of these is discussed and types A–G illustrated, although no drawing was made of seal H owing to its initial confusion with E. This is followed by a catalogue and discussion of the small seals, types I–S, used to close object boxes. The section ends with a general essay on the history and interpretation of the 'Seal of the Necropolis', which,

to our minds, is a much better study than that of Goedicke, *SAK* 20 (1993), 67–79, which appeared at the same time.

Despite the shortcomings of the pottery chapter, which are more than made up for by the studies of Hope and Kaper, this book is a valuable addition to the Tutankhamun tomb literature, and for the most part, can be highly recommended.

D. A. AND B. G. ASTON

Uschebti. Arbeiter im ägyptischen Totenreich. By HERMANN A. SCHLÖGL AND CHRISTA MEVES-SCHLÖGL. 227×315 mm. Pp. 78, pls. 104 (unnumbered). Wiesbaden, Harrassowitz Verlag, 1993. ISBN 3 447 03357 6. Price DM 108.

This short book, dedicated to Erik Hornung, is a publication of 24 shabtis from private collections. With one exception, all the figures are hitherto unpublished.

A one-page preface provides an outline of the function and development of shabti figures, and includes a brief review of the main studies of the subject. The remainder of the book is devoted to a description of each figure, with notes on the owner's name and titles, dating, dimensions, material, colour, provenance and condition. The inscriptions are reproduced in hand-copies, and translations are provided. Where appropriate, comments are given on the iconography, texts, provenance and dating of the figures. There are references to other shabtis of the same owner, and to comparable pieces belonging to different persons, one of the stated aims of the study being the identification, through stylistic similarities, of figures which may have been produced in the same workshop. Each figure is illustrated in two to four black and white photographs.

Seven of the shabtis date to the New Kingdom, five to the Twenty-first and Twenty-second Dynasties, and the remainder to the Twenty-fifth Dynasty to the Ptolemaic Period. Since they do not constitute a representative cross-section of shabti development, it is not clear on what basis the selection has been made, nor is information on the present whereabouts of the figures given. Some have reliable provenances, others do not, and they range from high quality pieces, such as those of Djehutymose, Horiraa and Wahibre-emakhet, to the very crude specimens, nos. 18 and 21.

With one exception, all the figures are of well-known types, and some (such as nos. 14-16) are familiar from comparable examples in various museum collections. The most unusual piece, no. 3, is a shabti made for the burial of the overseer of cattle of Amun Djehutymose, who was interred at Tuna el-Gebel. Although conventional in other respects, the shabti has the head of a baboon and in the text the name of the owner is preceded by that of Hapy, one of the sons of Horus. As the authors point out, there is a jackal-headed shabti belonging to the same man now in the Toledo Museum of Art, although on this example the inscription mentions only 'the Osiris, overseer of cattle Djehutymose', leaving the jackal head unexplained. Hans Schneider had supposed (*Shabtis*, I (Leiden, 1977), 264-5) that this figure was meant to identify the owner as Anubis, but the Schlögls are surely correct in challenging this view and in suggesting that Djehutymose possessed shabti figures representing all four of the sons of Horus. There is a valuable discussion of the possible significance of these figures, in which passing reference is made to the only other known canine-headed shabti, that of Nahuher, British Museum EA 47398. It is perhaps worth mentioning that this figure comes from D. G. Hogarth's excavations at Asyut, 1906-7, and that it is inscribed with Chapter 6 of the Book of the Dead—not present on the examples made for Djehutymose. These figures represent an interesting variation on the standard role and iconography of the shabti, and it is much to be hoped that further examples will come to light, making possible a more accurate interpretation of their function.

Otherwise, the book calls for little comment. The discussions are invariably up-to-date and useful. The photographs are of somewhat uneven quality. Some are not sharp (nos. 5, 21, 22b) and appear to have been printed at too great an enlargement. In others the lighting is unsatisfactory and the contrast correspondingly poor. Nonetheless, this is on the whole a well-produced

and useful addition to the literature on one of the most fascinating classes of Egyptian antiquities.

JOHN H. TAYLOR

Akoris. Report of the Excavations at Akoris in Middle Egypt, 1981–1992. By THE PALEOLOGICAL ASSOCIATION OF JAPAN, INC., EGYPTIAN COMMITTEE. 215 × 303 mm. Text volume, pp. xix + 484, figs. 304. Plates volume, monochrome pls. 157, colour pls. 6. Kyoto, Koyo Shobo, 1995. ISBN 4 7710 0755 1. Yen 20,000.

Excavations and surveys of Tehneh el-Gebel (Akoris) have been undertaken sporadically from at least 1716 (cf. C. Sicard, *Oeuvres* I. *Lettres et relations inédits* (Cairo, 1982), 7–8), and excavation reports are scattered throughout Egyptological literature. The book under review, however, is the first monograph dedicated solely to excavations at this interesting site in Middle Egypt, and basically describes the results of several seasons' work by the Heian Museum of Ancient History, continued after the Museum's closure in 1988, by the Paleological Association of Japan. Separated into eight sections, written by a number of different authors, the book comprises: a general introduction (pp. 1–10); a chapter—really much more than just a chapter—entitled 'Architecture and Stratigraphy', which describes the actual excavations (pp. 11–179); a detailed list of the objects found (pp. 181–259); technological studies (pp. 261–97); philological studies (pp. 299–380); chemical studies (pp. 381–420); and various appendices (pp. 421–472), ending with a historical summary in English and Japanese.

The introductory section comprises a short description of previous work at the site, a list of staff members, and a statement of the purpose of the excavations, which we are told, was 1) to elucidate the constitution and function of the city; 2) to establish the chronological sequence of the city; 3) to verify the philological results of previous studies; and 4) to obtain Coptic texts. The general description of previous work at the site is very brief and incomplete; for a much fuller treatment of this topic, the reader would be better advised to consult É. Bernard, *Inscriptions grecques et latines d'Achôris* (Cairo, 1988), vii–xx (hereafter *IGLA*). Interestingly, the Japanese team chose both to re-excavate parts already cleared, sometimes with surprising results, and to excavate areas previously untouched. The section devoted to the actual excavations begins with a reclearance of six tomb chapels, designated by the excavators A–F, located near the so-called Western Temple. When the shaft in Chapel B was recleared, the south burial chamber still contained the burnt, damaged remnants of three burials of the early Twelfth Dynasty (pp. 27–33), with extant remains of three coffins, a wooden boat model, kohl pots, a wooden headrest, a bronze mirror and pottery. Whilst dated simply to the Middle Kingdom by the excavators, and to the late Eleventh–early Twelfth Dynasty by the restorers of the boat model, the group can be more closely dated to the reign of Sesostris I by the associated pottery. Chapels C–F were originally cleared by Abou Seif (*ASAE* 26 (1926), 32–8), and numbered from 1–4. H. Kawanishi and S. Tsujimura seem surprised (pp. 37–8) that the 380 shabtis and broken coffins found by Abou Seif within Chapel D (= Tombeau 3) were no longer there. It may interest them to know that the 380 shabtis (of the overseer of the city, and vizier Ankhwennefer) are now in Cairo, inventory numbers JE 49639-51, whilst the mask of the innermost coffin is also in Cairo (JE 49652), the remaining coffin fragments presumably having been too decayed to save. Indeed, it is strange that although Kawanishi and Tsujimura refer to both Abou Seif's and Gauthier's (*ASAE* 26 (1926), 41–3) reports and their finds, they do not mention the names of the people buried here. As well as the vizier Ankhwennefer, they are the second prophet of Amun, Pasherenese, the like titled Ankhefenkhons, an ordinary priest of Amun, Ankhefenthoth and a god's father of Amun, Amenemopet. From their titles these men clearly exercised duties in Thebes, but are curiously omitted from K. A. Kitchen's *The Third Intermediate Period in Egypt 1100–650 BC* (Warminster, 1972, supplement 1986, reprint with additional preface 1996).

Excavations within the Western Temple area itself are described in detail on pp. 43–130. The temple was originally built under Nero and subsequently overbuilt by domestic structures, and it is these which are described in depth, whilst the temple itself is mostly ignored. Test trenches

dug through the original temple and dromos floor carried the stratigraphy back from the late sixth–seventh centuries AD to the Third Intermediate Period. These excavations and test trenches are fully described with numerous plans and pottery drawings, though very little attempt is made to tie in these findings with the earlier excavations of G. Lefebvre and L. Barry (*ASAE* 6 (1905), 141–58), and J. Lesquier (*BIFAO* 8 (1911), 113–33). Surely the reports on the dromos ('Sacred Road') should have included some mention of the statues which once lined the route (cf. *IGLA*, xxiii and texts mentioned). Perhaps one of the most interesting results of the stratigraphy established by the Japanese was the means afforded to date other (domestic) structures on the site by the size of the mud-bricks from which they were built (pp. 265–8). The chronological findings of the Japanese team are that, at Akoris, brick sizes 26–31 × 13–15 × 6–7 cm date to the Third Intermediate Period; 32 × 16 × 7 cm are Late Dynastic to the first half of the Ptolemaic Period; 38 × 18 × 12 cm are Ptolemaic to early Roman; 32 × 16 × 12 cm are late third century–early fourth century AD; 29 × 14 × 10 cm are late fourth century–early fifth century AD; 26 × 13 × 8 cm are later half of the sixth century to seventh century AD; and 24 × 12 × 8 cm date from the end of the sixth to the second half of the seventh century AD. Brick sizes 34–8 × 18 × 7–8 cm are not dated in the text but would appear to belong to the Third Intermediate Period. It would seem that similar results are found for domestic structures at other sites; cf. A. J. Spencer, *Brick Architecture in Ancient Egypt* (Warminster, 1979), 102–3 (Tsujimura's criticism that Spencer did not consider the thickness of the bricks seems somewhat unfounded).

Outside the Western Temple area, the team also re-examined the Serapeum (pp. 130–43) and conducted entirely new excavations around the city wall (pp. 143–7), at the 'Pool' and at other sites in which the ruins of stone buildings were exposed (pp. 148–79). The report on the Serapeum includes a suggested reconstruction, but omits any mention of Grossmann's previous survey (*MDAIK* 37 (1981), 199–202), and makes no reference to the publication of the stelae which indicate that this temple was indeed dedicated to Serapis (G. Wagner, in *Hommages à Serge Sauneron*, II (Cairo, 1979), 52–6). The new excavations, undertaken where stone blocks were found on the surface led to the discovery of a Roman 'pool', a tile-floored chamber and a stone building of unknown function.

The detailed lists of the finds (pp. 181–260) essentially consist of catalogues of the wooden objects, metal finds, coins, stone objects and blocks, pottery lamps, clay objects, amphora stoppers, beads, amulets, and reputed pre-pharaonic stone implements. The latter (pp. 209–12) consist of flint tools considered to be prehistoric and therefore out of context. This, however, is evidently based on the false assumption that 'if it is flint, it must be predynastic'; however, flint tools were used throughout Egyptian history (cf. A. Tillmann, *Die Steinartefakte des dynastischen Ägypten, dargestellt am Beispiel der Inventare aus Tell el-Dabʿa und Qantir*, unpublished Ph.D dissertation, University of Tübingen, 1992), and these implements may well be contemporary with the layers in which they were found. Only pottery is not fully treated in this section, since all pots are illustrated and described within the previous section wherever they happened to be found.

The technological studies (pp. 261–97) vary somewhat in their depth and usefulness. The most detailed is the study of the textiles (pp. 277–94), whilst the most useful are the study of the mud-brick sizes, already alluded to, and the study of the lamps, which, coming from stratified layers, enabled the authors to redate at least one of the types published by D. M. Bailey in his *A Catalogue of the Lamps in the British Museum*, III (London, 1988). The remaining sections are concerned with pottery, glass and observations on the chisel marks.

The philological chapter is divided into pharaonic (which includes the Ptolemaic) and Greek, Coptic and Arabic material. Of the former the most important is undoubtedly the reused stela of Osorkon III (pp. 301–5), originally set up to record the king's donation of *nḥḥ*-oil to the Temple of Amun-Re-mai-khenty. Whilst the text follows the normal pattern of a donation stela, its greatest interest is in the number of titles held by the king, which includes that of High Priest of Amun, a factor which helps give credence to the view that the High Priest Osorkon B and Osorkon III are one and the same. Of the post-pharaonic material, the most valuable is the series of papyri, written in Coptic and Greek, sometimes mixed within the same text, which relate to a monastery which functioned at Akoris during the latter half of the seventh century AD (pp.

330–62). The importance of these documents lies in their references to religious trouble between the monks and Muslims in 689. This is the only reference to such troubles from Coptic, rather than Arab sources, and, moreover, the earliest indication of troubles since the Islamic conquest of 641.

The chemical studies chapter (pp. 381–421) is another unbalanced section, and one wonders about the usefulness of some of them. An example is the X-ray fluorescence analysis of the pottery (pp. 381–90), which really is a waste of space. It is nowhere explained why the analysis was undertaken, or what the results mean. Some pottery samples were assigned to groups A, B and C depending on the strontium and zirconium spectra. What is the value of this? We are never told whether the results indicate whether the pots are made of Nile clays or Marl clays, or whether they were locally made or imported (and if so, from where), and what is worse, despite the excellent ceramic drawings found in the present book, there is no concordance between the lists of analysed samples and the illustrated pieces. The remaining sections deal with a) the identification of dyestuffs (pp. 391–418), where this time the results are converted into useful information in that the probable sources of the dyes are identified, and b) an analysis of the wood used in the production of the Middle Kingdom model boat (pp. 418–20), which is itself the subject of the first appendix (pp. 421–51).

The remaining appendices comprise a study of animal designs in Coptic textiles (pp. 451–9); an examination of street planning in Akoris (pp. 460–63), which the excavators conclude varied little from the Third Intermediate Period to the seventh century AD; an analysis of olive oil production, evidently a major industry in Akoris during the fourth to sixth centuries AD; and finally, observations on the significance of the ancient ruin site to the modern fellahin—a relationship which underwent changes during the course of the excavations since during these times the modern village was connected to the electricity grid and the influence of television.

To sum up, this is, for the most part, a good book, well presented with superb line drawings throughout, backed up by 880 photographs (all without a scale) arranged on the 162 plates. In conclusion, anyone who has worked in Egypt, can only sympathise with the fate which befell the excavators so drily reported at the top of page 60!

D. A. ASTON

Glass from Quseir al-Qadim and the Indian Ocean Trade. By CAROL MEYER. Studies in Ancient Oriental Civilization No. 53. 225 × 298 mm. Pp. xxvi + 201. Chicago, The Oriental Institute of the University of Chicago, 1992. ISBN 0 918986 87 7. Price $35.00.

Many reports on archaeological glass confine themselves to one period, and concentrate firmly on the forms discovered and their dating. This approach is useful as far as it goes, but the reader is rarely given any feeling for the broader context of the glass as part of a production and distribution system, nor indeed of its social context. For information on these aspects the reader must rely all too often on the overall site report.

Carol Meyer's book on the glass from Quseir al-Qadim, the ancient Leukos Limen, therefore represents a refreshing divergence from this pattern since it not only examines glass from the two distinct periods represented at the site (Roman and Mamluk), but also sets out to examine the contrasting trade patterns between these two periods, the importance of the glass trade and the transfer of glass technology. In chapter 1 these three issues are specifically highlighted for examination, and although they are not treated in a detailed analytical way, they are at least discussed in some depth in the succeeding chapters.

Before looking further at the trade evidence, however, something should be said of the presentation of the descriptive part of the publication, which comprises chapters 2, 4 and the final corpus. The Roman material is of the first and second centuries AD and is represented by a description of 373 sherds, representative of the several thousand fragments discovered. These are divided into groups and a summary discussion of each is provided. The discussion is accompanied by one or two type drawings representative of the group as a whole, whilst at the end of the corpus section there are fourteen plates illustrating each of the sherds described. The treatment of the

221 Mamluk sherds of the thirteenth–fourteenth centuries is the same, this time accompanied by six plates of drawings. A summary catalogue accompanies each plate.

I used the Roman part of this corpus extensively whilst examining glass from Berenike in January 1996 and found it invaluable. The clear, concise descriptions accompanied by generally good drawings allowed the identification of several pieces with which I was personally unfamiliar. Reference is frequently made to related corpora, which I again found useful.

Some of the terminology used to describe features of the glass is not standard (for example, 'kick-up base' for what would normally be called a 'concave base'), although it is generally obvious what is meant. Unfortunately, however, the plates section of the book does suffer from one significant drawback, which is that only one plate of photographs is provided. Whilst photographic plates are always expensive, a publication such as this really ought to have been given a sufficient budget to allow for a more extensive use of photography. Much of the glass would have benefited from the use of colour photographs, but this was clearly ruled out.

Chapter 3 deals with Roman glass trade, chapter 5 with that of Mamluk times and chapter 6 gives a summary and conclusion. The author examines the question of glass production at the site and concludes that although it served as a distribution point for glass, it was not actually a manufacturing centre. This is perhaps not surprising given the relative isolation of the site, and more especially, the lack of a sustainable supply of suitable fuel for use in glass furnaces.

The question of where exactly the Roman glass was made is more difficult to answer. Alexandria is usually cited as a major centre for the industry, but there is little industrial evidence from the city before the fifth–seventh centuries from which period furnace fragments are known. Cast vessels in colourless glass, which have often been attributed to an Eastern source, possibly Alexandria, could also have been produced in the West, as noted by Grose.[1] Alexandria is also raised as the possible centre of production for the so-called mythological bowls, and this is clearly an area for further research.

Whatever the origins of the glass collected at Quseir al-Qadim, it is clear that it was intended as part of a generally high status cargo. Given the evidence available to us from sources such as the *Periplus Maris Erythraei*, a kind of Roman trade and navigation handbook, it is evident that the long distance trading missions which left from the Red Sea ports were expensive and potentially hazardous. It is characteristic of early trading ventures of this kind that only high value goods were traded since only they could hope to repay the high costs of the venture.

There is, however, a general lack of parallels for the Quseir glass from sites in India, and where glass does occur, it is not possible to say with certainty by what route it came, or for what purpose it had been imported. A broader treatment of the archaeological evidence for Roman imports into India, South Arabia and the Persian Gulf might throw much light on the position of the glass trade. This is outside the scope of Meyer's book, so that while interesting areas of future research become apparent, the discussion overall has to remain inconclusive.

It should not be forgotten that glass can be exported not only in the form of finished products but also as ingots or cullet (for recycling) so that there is a need to distinguish between glass-*making* from its raw materials, and glass-*working* from pre-prepared glass. The *Periplus Maris Erythraei* may suggest the import of raw glass to India for working up into beads and ornaments and, if so, gives an interesting picture of the development of the local industry dependent on external sources for its raw material. In passing, Meyer notes the widely held belief that the glass industry of Pharaonic Egypt was dependent upon imported glass; this may be true, but at present the evidence seems to me circumstantial and considerably more research, including laboratory analyses, should be undertaken before this is accepted as fact.

In Mamluk times the type of glass traded seems to have changed from luxury items to more prosaic domestic wares, many of them destined for the east coast of Africa where there were Islamic settlements but apparently no local glass industries. Less costly items might be transported because of improvements in shipping and a greater commonality of culture between Egypt and the Indian Ocean periphery, which came to be the preserve of Islamic traders in the same way as the Mediterranean had for European merchants. In passing, it should be noted that Meyer pays considerable attention to the design and tonnage of ancient shipping, which is all too often overlooked in favour of general statements about their cargo.

In summary, this is a very welcome study of glass and its role in trade, and one which provides a valuable corpus from an important site. Although the discussion of trade is necessarily patchy, it clearly indicates the potential for future study.

P. T. NICHOLSON

Papyrus Reinhardt. An Egyptian Land List from the Tenth Century B.C. By SVEN P. VLEEMING. Hieratische Papyri aus den Staatlichen Museen zu Berlin, Lieferung II. 215 × 305 mm. Pp. v + 90, figs. 4, pls. 15. Berlin, Akademie Verlag, 1993. ISBN 3 05 002005 9. Price not stated.

In this compact volume Vleeming presents the first full edition of Papyrus Berlin 3063, known as Papyrus Reinhardt. The manuscript preserves a land list, and is one of a group relating to Amun Domain fields in the tenth nome of Upper Egypt, as shown by toponyms such as Inmut and theophorous personal names formed with Nemty (Vleeming reads with Sethe and Graefe Anti, without reference to the discussion by Berlev in which the reading Nemty was established). It was acquired by the Egyptian Museum, Berlin, in 1888 from one Carl Reinhardt, who had been in Egypt since 1886. At about the same time the related documents Papyrus Prachov and the Griffith Fragments were acquired, the latter at Luxor. It seems impossible to ascertain provenance within Upper Egypt, and Vleeming wisely leaves the question open. It is, however, worth noting that by that date northern Upper Egypt and Middle Egypt had been opened up by pioneering site surveys of the Antiquities Service. Akhmim and Asyut are two sites from which substantial numbers of antiquities were being acquired by the end of the 1880s. A pertinent example is provided by the modern history of Papyrus British Museum EA 10061, the long overlooked other half of Papyrus Amiens (J. Janssen, *GM* 147 (1995), 53–60). It was acquired in Asyut in 1880 by one Edward Baldwin, who paid only a piastre for it; presumably that roll had been cut in half to give each of two finders an equal share, rather than to increase profits. Like Papyrus Reinhardt, Papyrus Amiens concerns the tenth nome of Upper Egypt; Asyut, a major strategic centre, may then be considered another candidate for the find-spot. Papyrus does not survive often on Pharaonic sites; there are considerably more elite cemeteries without papyrus fragments than with them. For this reason it is worth registering find-spot of Pharaonic manuscripts when known, with the dates of their modern emergence, as part of the evidence for their ancient distribution. A key determinant in this is the administrative centre as writing centre. The presence of papyri at Asyut could be explained from its role as a military, and thus automatically as an administrative, centre.

Originally a chancellery roll 48 cm in height, comprising at least seven and probably many more sheets each 20 cm in breadth, Papyrus Berlin 3063 had been reduced to a series of fragments even by the time of its acquisition by Reinhardt. The displacements of wartime inflicted further damage on the fragments; prewar photographs are, as so often the case with Egyptological archive material, the only means of survival of substantial portions, such as all of column 4. The first task of the author, with the help of Mrs Krutzsch, the talented papyrus conservator in East Berlin, was to reconstruct the roll; this meticulous work is clearly outlined in text and diagrams (pp. 5–7). A set of unrelated fragments from a second, contemporary administrative document could be removed from the field of study; Vleeming proposes that these be distinguished in future as Papyrus Berlin 3063B. The palimpsest verso text is also not taken into account, as it is virtually illegible and from the few discernible groups does not seem to form part of the main text, on the recto.

This volume is indispensable to scholars for two reasons. First, it contains a clear transcription and translation with related commentary for an example of that rarest of Pharaonic survivals, a

[1] D. Grose, 'Early Imperial Roman cast glass: the translucent coloured and colourless fine wares', in M. Newby and K. Painter (eds), *Roman Glass: Two Centuries of Art and Invention* (Society of Antiquaries of London Occasional Paper 13; London, 1991) 1–18.

land account. Secondly, the concise commentary to this one manuscript effectively provides a lucid guide to the major problems in our understanding of Pharaonic agriculture on the basis of the texts. Papyrus Reinhardt contains two basic entry types, one giving calculations of field area, and the other (only found in columns 4, 7 and 10) summarizing the field entries and calculating grain amounts. At fifteen sacks per aroura, the grain amounts in the summarizing entries seem too high to be yields, but too low to be a rent or tax. This is the same problem encountered by Gardiner in the late Ramesside land lists of Papyrus Wilbour, and highlights our deep ignorance of the workings of Egyptian agriculture and indeed, of the basic juridical regime of land in Egypt, the questions of who owned the land and how. The papyri never make explicit a delivery as tax, rent or 'ad hoc dues'; translations of particular Egyptian terms as 'tax' etc. are generally modern interpretations without discussion of the precise reference of the term. In the same vein, the texts do not specify whether a person named in connection with land is the owner, the farmworker or the intermediary between institutions and individuals. In the case of Papyrus Reinhardt, the fields are connected with four levels of human agency: the Amun Domain (supervising for Pharaoh ?), the high official responsible, the local supervising official, and the cultivator (presumably a 'farmer' in the sense of a manager who oversees the manual labour of others, rather than being himself a farmworker). In these chains of supervision for channels of revenue, we tend to lose sight of the highest and lowest levels of production: the instance of kingship, and the labour force. It remains a formidable challenge to develop an economic history against this lack of knowledge.

Names of land types give a second clear instance of our lack of knowledge of, or acquaintance with, the conditions of Egyptian agriculture before the barrages. Prior to this publication the fullest recent interpretation of land designations was that by Schenkel. On pp. 45-7 Vleeming offers a valuable and convincing discussion of the terms 'high/new land', returning to the literal interpretation of 'high land' in the light of Karl Butzer's *Early Hydraulic Civilization in Egypt* (Chicago, 1976). This example is typical of the dense wealth of comment and data in the commentary and throughout the volume. The author has succeeded in clarifying this and the related manuscripts, and in showing the problems that can be solved, and those that remain in the infant study of Egyptian agriculture.

STEPHEN QUIRKE

Un traité égyptien d'ophiologie. Papyrus du Brooklyn Museum No.47.218.48 et .85. By SERGE SAUNERON. Bibliothèque Générale XI. 245 × 320 mm. Pp. xi + 243, pls. 22. Cairo, l'Institut Français d'Archéologie Orientale, 1989. ISBN 2 7247 0077 5. Price not stated.

A Late Period Hieratic Wisdom Text (P. Brooklyn 47.218.135). By RICHARD JASNOW. Studies in Ancient Oriental Civilization No. 52. 225 × 297 mm. Pp. xviii + 240, figs. 20, tables 4. Chicago, The Oriental Institute of the University of Chicago, 1992. ISBN 0 918986 85 0. Price not stated.

These two volumes present model text editions with a particular added significance, in that they bring to life two manuscripts from one of the three extant Pharaonic libraries: the Ramesseum Papyri of the late Middle Kingdom, the Chester Beatty Papyri of the late New Kingdom, and the Wilbour Late Period Papyri. These Wilbour papyri were, as Jasnow explains (p. 1), donated to the Brooklyn Museum in 1947 in the form of several well-preserved rolls and 130 boxes of fragments. Between 1966 and 1968 Sauneron had eleven rolls placed under glass, and commenced study of what immediately emerged as an outstanding group of texts. The posthumous publication of the snake treatise serves as a fitting memorial to that scholar. The difficulties in restoring this third Pharaonic library to scholarship are well illustrated by the case of the literary manuscript published by Jasnow. First recognised by Georges Posener in 1952–53, it took seven more years of conservation work by Anthony Giambalvo, with the background operation of sorting the fragments over the decades, before in 1985 Richard Jasnow began the final and successful reconstruction of the manuscript as it survives. In its present condition, as Jasnow discusses in full, it is unclear how unitary a composition it once was. For these and all other discussions I recommend the exemplary commentary, as also for the snake treatise published by Sauneron. In

this review, rather than addressing the individual points raised by each of the two papyri, I wish to draw attention to two more general issues: content and Greek influence.

The range of the Wilbour Late Period Papyri can be seen in the five published manuscripts and the summary by De Meulenaere in *LÄ* IV, 693–5. Brooklyn 47.218.50 is a ritual roll (*ḥbyt*) with the text for the Confirmation of Royal Power at New Year. Brooklyn 47.218.135 is the wisdom text published by Jasnow. Brooklyn 47.218.138 is the Sauneron snake treatise, one of 'several' healing texts, a broad category within which I would also place 47.218.156, the 'Brooklyn Magical Papyrus'. Under 'healing', the Egyptians differentiated between incantation, prescription and treatment (diagnosis and prognosis included); our terms 'magic' and 'medicine' have not been successfully defined for the Pharaonic context, and seem to me unproductive; cf. Ken Arnold 'Magic, whose Magic?', in Ken Arnold et al., *Abracadabra, the magic of medicine* (London, 1996). Brooklyn 47.218.84 may perhaps be classified as a technical text, a compendium of the cult topography of the Delta, to be published by Dimitri Meeks. This combination of literary, ritual, healing and technical texts is exactly that found in the Ramesseum Papyri of the late Middle Kingdom and the Chester Beatty Papyri of the late New Kingdom. I would certainly not conclude that all Pharaonic elite libraries contained this range of text; such a projection of the seventeenth century Western European library onto the Pharaonic past is only one of many possible historical speculations. Yet the coincidence in content among the three libraries does justify further reflection. Possibly the presence of healing texts proved the critical factor in the decision to place each of these three particular libraries in the ground, in the case at least of the Ramesseum Papyri as an additional weapon in defence of the dead body. The Chester Beatty Papyri seem to have been placed in a tomb-chapel for their own protection, if we accept the interpretation of sources for that group by Pestman (in R. Demarée and J. Janssen (eds), *Gleanings from Deir el-Medîna* (Leiden, 1982), 155-72, to be emended on genealogical details). It seems likely to me that the Wilbour Late Period Papyri survived in the same way, as burial equipment. Those who would interpret the group as a temple library need to explain both the inclusion of a literary manuscript, and the circumstance of preservation of substantial rolls; temple caching remains a possibility, but the range of contents and the two earlier parallels point sooner to deposition in a private tomb as the mechanism of survival. The question of ownership cannot readily be solved from the contents. The snake treatise is addressed specifically to the *ḫrp srqt* conjurer of Serqet, but that heading records for us only the intended user, not the historical owner of this manuscript. The Ramesseum Papyri were found in a tomb-shaft which contained a range of burial goods without name or title but generally indicative of a 'lower elite' burial; cf. Janine Bourriau, 'Patterns of change in burial customs during the Middle Kingdom', in S. Quirke (ed.), *Middle Kingdom Studies* (New Malden, 1991), 3–20. Only the Chester Beatty Papyri can be placed in a social context, and, notwithstanding the number of healing texts in the group, they belonged not to the healers, but to the scribes of a community. This suggests that, in at least some communities, ability to read (more relevant here than the related but distinct ability to write) involved at least some scribal officials in ownership of this range of texts—literary, ritual, healing and technical. Perhaps the rich written source material of the Deir el-Medina community will enable researchers to reconstruct at least in part how that official then used those texts: important questions include whether he read them to others and/or to himself, and whether he preserved them for prestige. The social context of these two Theban libraries is in both cases marginal to the elite as a whole; Deir el-Medina is an anomaly in literacy, consisting of a group of royal craftsmen employed for the central state project of creating the royal tomb, and, in the period of the 'lower elite' tomb of the Ramesseum Papyri (probably late Thirteenth Dynasty), Thebes itself may have ranked low as a centre of literacy as compared with the Residence at Itjtawy and the major cities farther north. In contrast to Mesopotamia, the great palace libraries of Egypt are lost, depriving us of the generative setting of literature, ritual and 'secular'. We can only reach the site of creation and the use of literary text indirectly though New Kingdom palace architecture and the echoes of palace life in hieroglyphic inscriptions.

The question of Greek influence on Late Period texts is relevant to both the literary composition and the snake treatise. Jasnow concludes his discussion of the contents of the wisdom text by disputing foreign influence on this and later, demotic teachings (p. 42), and would set in an

Egyptian tradition even the Golden Rule at col. 5, 7–8, 'that which you hate to be done to you, do not do it to another' (p. 100). The treatise edited by Sauneron seems still more strongly contested terrain. Its total of thirty-seven serpents (the thirty-eighth creature listed is the chameleon) coincides with the number of snake names known today from classical Greek and Latin texts, and with the number registered by modern analytical science for Saharan Africa. In the first half of the treatise, each serpent is described analytically, noting whether it is venomous and whether its bite can be treated; the second half gives the prescriptions to be administered. The whole document carries less the ambience of ancient Egyptian descriptive text than of Hellenistic enquiry and method. The difficulties in dating Late Period hieratic frustrate our efforts to secure the place of the manuscript in time, from the seventh century when the first Greek contacts occurred to the third century with the Alexandrian foundations of Museum and Library. The classical language of the treatise further frustrates attempts to determine its date of composition, and we are left uncertain how Egyptian this hieratic papyrus is.

Into this debate, in which so little direct evidence is available, I would introduce British Museum EA 10547, a small but remarkable set of papyrus fragments drawn to my attention by François-René Herbin. They were evidently detached early this century from cartonnage, but have only recently been conserved and realigned. Their text includes a series of entries preceded by the rubric 'survey (*mȝȝ*) of all plants of field...' (perhaps 'of marsh and field', or 'of valley-margin and desert/oasis', or perhaps of a placename beginning Sekhet-..., such as Sekhet-hemat, the Wadi Natrun), and specifies the properties of plants with reference in part to ailment. The practice of reusing papyrus rolls to make cartonnage burial elements began in the mid-third century BC; the hand is late hieratic, but is not yet more closely dated. Although the fragment cannot then help to refine the dating of the snake treatise manuscript (as opposed to composition), it broadens the range of analytical descriptive healing text into what we would term botany. This is of great importance, because for botany we do have a direct and distant ancient Egyptian antecedent, the gloss on the plant *snwtt* from the greatest manuscript of prescriptions, Papyrus Ebers, a papyrus of the sixteenth century BC bearing a composition perhaps of Middle Kingdom date (Ebers col. 51, 15–17). Here an indigenous Egyptian contribution to Alexandrian science becomes clearer; perhaps the success of that Hellenistic capital depended on an original fusion of Greek and Egyptian tradition specifically in text and method. The Egyptian element tends to be lost not only because Alexandria used Greek rather than Egyptian language and script, but also because modern scholars rarely read, let alone study, both Greek and Egyptian. At this stage of research we are still defining, and so isolating, Egyptian from foreign elements, a process always at risk of the contending and anachronistic emotions of nationalism and internationalism. The next phase of research may then study the interplay of elements in the different centuries and the products of fusing traditions. The Wilbour Late Period Papyri occupy a central place in these studies, and both Richard Jasnow and the late lamented Serge Sauneron have greatly enriched historical scholarship with their model editions of two such extraordinary manuscripts from the group.

STEPHEN QUIRKE

Der Amunhymnus des Papyrus Leiden I 344, Verso. Band I–III. By J. ZANDEE. Collections of the National Museum of Antiquities at Leiden. 210 × 280 mm. Pp. xxii + 1106, pls. 38. Leiden, Rijksmuseum van Oudheden, 1992. ISBN 90 71201 10 4. Price not stated.

With these three volumes a double achievement is delivered to Egyptology, the new photographic record by P. J. Bomhof of the great Amun hymn on the verso of Papyrus Leiden I 344 (plates 20–38 in Band III), and the last masterwork of the late Professor Zandee, a classic exegesis of the text, with hieroglyphic transcriptions. The plates instantly reveal the extent both of the manuscript (3.74 m in length) and of the lacunae depriving us in particular of much of its second half. Zandee divides the twelve columns of text into twenty-four strophes, mainly from the surviving rubra, although these are sometimes hypothetical dividing points in the lacunae, and even among the surviving examples seem of different weight: thus Zandee strophes 6–7 and

10–11 are divided by the 'end' arm-determinative, and the rubrum at col. 9, 9 is interpreted as a liturgical pause-mark in the middle of Zandee strophe 18, on the grounds that that strophe is longer than the usual four or five lines. Evidently the formal structure of this text remains a subject for research; to prevent misunderstanding, I would identify the sections proposed in the publication as 'Zandee strophes', and give references to passages by column and line (as the author does in the introductory summary on pp. 6–12). I would agree with Zandee that the series presents a plausible whole, the first half concentrating on the solar sequence of creation from primeval water to the day and night journeys of the sun, and the second half turning to praise of the creator as sovereign of creation. The creator is generally named in the hymns as Amun, Ra or Amun-Ra, with varying focus on the solar aspects (Atum, Khepri, Horakhty, the Behdetite) and the physical creation (as in col. 4, 8–9 Kamutef, and col. 10, 7 Khnum).

Jan Assmann noted four elaborate and non-liturgical compilations of hymns to the creator (Amun-)Ra (*Sonnenhymnen in thebanischen Gräbern. Theben*, I (Mainz am Rhein, 1983), xxxiv): the mid-Eighteenth Dynasty Papyrus Cairo 58038 (Boulaq 17), the late Eighteenth Dynasty Tura Quarry Hymn, and the two Nineteenth Dynasty Papyri Leiden I 350 and Chester Beatty IV (British Museum EA 10684). Beside these he notes the liturgical hymns of Papyrus Berlin 3049 and the Hibis temple. In the large corpus of shorter hymns to the solar creator, Assmann registers six standard texts from which most of the individual examples of short hymns were drawn. This proliferation of variants on a tightly drawn textual core recalls the traditions of medieval manuscript celebrated by Bernard Cerquiglini against the academic philological discipline of stemma in *Euloge de la variance*. Its operation may be difficult for the Western scholarly tradition to absorb, and is perhaps as much an obstacle to modern inclusion in 'literature' as its religious content. Borrowing the terms of Yuri Lotman (*Struktura khudozhestvennogo teksta* (Moscow, 1973)), we might say that, like much Egyptian art, it obeys an 'aesthetic of identity', rejoicing in the treatment of detail and in the variations on received motifs. In contrast, mimetic texts (employing the definitions in Loprieno, *Topos und Mimesis*), like the art we label 'portraiture', draws its equal, but not superior, power from the 'aesthetic of difference' in which the strength of each element derives not from its subtly changed conformity to a pre-existing motif, but from its deliberately visible rupture with the received. Hymns to the solar creator constitute a genre developed in the New Kingdom from Second Intermediate Period antecedents, and most famous in a separate incarnation as the Great Hymn to the Aten from the reign of Akhenaten. These non-liturgical hymns, in particular the longer series on papyrus and the excerpts on ostraca, indicate that the 'hymn outside cult' belongs at least in the New Kingdom within the corpus of Egyptian literature, Egyptologically reserved for narrative and wisdom literature. Although the Leiden hymn is written in a different hand to that of the literary discourse on the recto of the papyrus, the so-called *Admonitions of Ipuwer*, this reuse of a literary manuscript to receive a series of hymns implies distance from the liturgy of temple cult. The hymns were not written or copied for cult, but as part of the verbal self-expression of an individual. The Leiden compiler-author is perhaps the scribe Haunefer who seems to be named as copyist in the fragment of text beside the end of *Admonitions* in the verso hand. Intriguingly he may also figure within the body of the second half of the hymns series, at col. 11, 3–4. From pls. 13–19 it may readily be seen that the first half of the series (from Zandee strophes 1 to 12) finds numerous parallels in contemporary Theban and Memphite hymns to the creator, notably the extensive passage at col. 4, 1–5 paralleled in the Theban tomb of Kheruef. In contrast, Zandee found no such parallels for the second half, concentrating on the theme of creator-god as king (Zandee strophes 14–24). The compiler, whether or not the scribe Haunefer, effectively juxtaposed two separate genres, the widely disseminated sun hymns and the hymns from the cult of the ruler. Both genres are attested in Theban and Memphite Late Egyptian Miscellanies, as well as on Theban ostraca. Memphite and Theban hieroglyphic monuments provide parallels for the sun hymns; the absence of hymns to the king may simply reflect the destruction of the most likely context for such inscriptions, the garden chapels of elite households. I owe to Ray Johnson the observation that there may be parallels to the Amarna royal cult chapels of private houses in unpublished elite Ramesside Theban houses. The compiler of the Leiden papyrus united the two genres into a single celebration of the creator. The publication of the results makes important primary material fully

accessible to Egyptological and wider study, and stands as a fitting memorial to the late great scholar.

STEPHEN QUIRKE

The Gooseherds of Hou (Pap. Hou). A Dossier Relating to Various Agricultural Affairs from Provincial Egypt of the Early Fifth Century B.C. By S. P. VLEEMING. Studia Demotica 3. 283 × 218 mm. Pp. xii + 278, pls. 14 (as separate fascicle + pp. 16 *Transliteration and Translation of Pap. Hou 1–13*). Leuven, Peeters, 1991. ISBN 90 6831 360 6. Price not stated.

The title of this book is misleading. While it is partly correct, in that it does contain the transliteration and translation of thirteen demotic texts from Hou in southern Egypt dealing with the affairs of a group of gooseherds, it fails to mention that it also carries a lengthy and invaluable excursus on the transcription of early demotic, which is likely to be a principal source of reference to anyone studying this stage of the script for many years to come. The thirteen demotic texts have been accessible to Egyptologists for many years. Three of them are kept in Strasbourg and were first published in 1902 by Spiegelberg; the other ten are housed in Munich and were also first edited by Spiegelberg as part of his publication of the Loeb Papyri in 1931. In recent years they have benefited from extensive revision and individual texts have been re-edited by Malinine and Cruz-Uribe, alongside an important re-evaluation of their provenance and chronology by Pestman. Given the amount of scholarly attention that has been bestowed on these texts already, it might be questioned whether they are really in need of yet another re-edition. By editing the texts as a group, however, and by devoting such care and attention to each demotic sign, the rationale for returning to these papyri is more than justified. In presenting his transliteration and translation, Vleeming not only establishes what is likely to be the definitive publication of these texts (and this is not a comment ever given lightly to the publication of a demotic papyrus), but also draws extensively upon his wide knowledge of early demotic texts to give a detailed explanation and interpretation of their contents.

The texts date to the period between 497 and 485 BC, that is, the end of the reign of Darius I and the first two years of the native pharaoh Psammetichus IV. Their provenance is clearly Hou (*Ḥw.t*), a small town downstream from Dendera. Family connections between the individuals mentioned in the texts are few and Vleeming rightly avoids the term 'archive', preferring the looser 'dossier' instead. How they came to be kept together can only be guessed. Their subject-matter deals with transactions of a limited lifespan, i.e. involving livestock (geese, donkeys and cattle), the leasing of land and loans. Such documents would not need to be kept in perpetuity as proof of ownership, as animals die and loans are repaid, and consequently could easily have been disposed of. It remains, therefore, a plausible idea that they were kept by a custodian of documents, as the editor suggests, and then thrown away when they no longer carried any legal force.

After a short introduction to the texts and some comments on their provenance, dating and subject-matter (pp. 1–11), the author offers a short summary of his approach to transcribing early demotic (pp. 12–15). In this he concentrates on the difficulties of transcribing certain ligatures, where the demotic shows a shortening of the underlying signs and where he, on occasion, prefers transcriptions which omit signs which were present in the historical hieroglyphic writing but not in the simplified demotic writing (e.g. he omits the *aleph*-vulture in his transcription of *pꜣ* and replaces it by a stroke). This 'narrow transcription', however, Vleeming rejects for ligatures which would result in 'nonsensical transcriptions', but this does lead to an element of inconsistency in approach. It would perhaps be better either to transcribe all ligatures historically or to use brackets to indicate the signs no longer present (an option Vleeming himself considers).

The transcription, translation and commentary (pp. 17–188) follow the short introduction. The texts are divided into three groups. The first (nos. 1–4) concerns 'texts dealing with geese',

and includes one partnership agreement and three receipts. The second section contains 'texts relating to various agricultural affairs' (nos. 5–11), which cover one lease of land, one donkey sale, one collective ownership of a cow, one renunciation of rights to a donkey, one cattle sale and two fragments, one of which pertains to cattle. Two of these texts were originally edited separately (P. Loeb 44 and 49), but Vleeming shows how the two fragments clearly belong to the same papyrus (his no. 6). On the other hand, the fragments which Spiegelberg published as P. Loeb 50 are now considered to belong to two separate papyri and are edited by Vleeming as his nos. 10 and 11. The third group (nos. 12–13) consists of two loans, one of money and one of grain. For each text the author provides a line-by-line hand-copy, hieroglyphic transcription and palaeographic notes on the left-hand page, with the translation and detailed commentary facing it on the right. The copious notes add considerably not only to our understanding of the texts themselves, but also provide invaluable insights into a plethora of related issues. Of particular interest are the notes on: the reading of *(m)-sḫ*, '(in) writing of' (p. 29 n. rr); *iw (n) šp*, 'entered as received' (pp. 32–3 n. bb); the difference in usage between *tš* (used to describe the nomes of Middle Egypt from the Hermopolite nome northwards) and *qḥ* (used for the districts from Siut southwards) (pp. 37–40 n. gg); *ꜣḫ-ꜥq*, 'revenue field' (pp. 77–8 n. ee); the significance of the phrase 'of the Treasury of Ptah' (to indicate the weights used, not the quality of the alloy) (pp. 87–9 n. uu); the branding of cattle (pp. 117–19 n. gg); *ms*, 'calf', and *bḥs*, 'heifer' (pp. 120–1 n. ii); cows' names in Egyptian and Greek (pp. 151–3 n. cc); interest rates in Late Period money and grain loans (p. 161 n. ee); and the different components of a debtor's property (pp. 173–4 n. qq). To the editor's note on the title *rmt-ḏm* (p. 97 n. cc) should be added H.-J. Thissen, *GM* 141 (1994), 89–91, where its connection to the military is explained.

The next section, excursus I (pp. 191–252) covers in detail the development, palaeography and transcription of a number of problematical early demotic signs. In arriving at his hieroglyphic transcriptions, the editor draws extensively on other texts in demotic and in abnormal hieratic and on the Oracular Decrees. While he limits himself to discussing signs which occur in the texts he has edited in this book, this nonetheless amounts to 65 examples. When these are added to the examples collected in P. W. Pestman, *Les papyrus démotiques de Tsenhor*, II (Leuven, 1994), to which Vleeming frequently refers, it means that reliable transcriptions are now available for the majority of early demotic signs. The value of this palaeographic investigation to anyone studying early demotic is inestimable and, while not all his transcriptions will be accepted by everyone as proven, the majority are surely now no longer in doubt. Two short additional sections follow. Excursus II (pp. 253–4) examines the notations of the first person singular = *y* suffix and the third future, while excursus III (pp. 255–60) looks at the formats of dated papyri from the Twenty-fifth to the Thirtieth Dynasties. The book concludes with detailed lists of sources and extensive indexes.

The quality of production of the book is high. Typographical errors are rare. It is easy to use, as the plates, along with an additional line-by-line transliteration and translation, are contained in a separate supplement. It is accompanied by delightful illustrations from ancient Egyptian tomb paintings of the preparation of geese for the dining-table. Vleeming is to be congratulated on providing such a valuable contribution to our knowledge of early demotic.

CARY J. MARTIN

Il Processo di Hermias e altri documenti dell'archivio dei choachiti (P.Tor.Choachiti): Papiri greci e demotici conservati a Torino e in altre collezioni d'Italia. By P. W. PESTMAN. Catalogo del Museo Egizio di Torino, Serie prima—Monumenti e Testi VI. 245 × 330 mm. Pp. xxx + 279, pls. 61. Turin, Ministerio per i Beni Culturali e Ambientali—Soprintendenza al Museo delle Antichità Egizie, 1992. L. 90.000.

Pestman has long insisted that a proper understanding of many Ptolemaic texts can come only from studying papyri in Greek and Demotic alongside one another, and an edition of the texts here published or republished by one of the few scholars who is competent in both these languages is very much to be welcomed. As the subsidiary title makes clear, the volume is not

limited to the twelve documents concerning the *choachytes* which are preserved in the Turin Museum, but includes as well papyri in other Italian collections (**13** and **14**, from Naples and Florence respectively). It does not, however, indicate that the volume also includes two papyri from the Louvre (**8B** and **11bis**). It should also be stressed that the volume is by no means a complete collection of all extant papyri relating to these particular *choachytes*. The papyri are to be found in the volume referred to throughout as P. Survey, and described in the introduction to the individual texts as P. W. Pestman, *The Archive of the Theban Choachytes. A Survey* (1991). In the footnote on p. xix, however, it is dated 1986 and described as 'ma non ancora pubblicato'. It has recently become available as the second volume of the Leiden 'Studia demotica', with the imprint 'Leuven, Peeters, 1993', and the full sub-title is *A Survey of the Demotic and Greek Papyri contained in the Archive*. The numbering of the texts in P. Survey is (naturally) different from that of *Il Processo di Hermias*; fortunately cross-references are given in both works. The reasons why the present selection is limited to the texts published in this volume are indicated by Pestman in his Preface.

All the papyri belong towards the end of the second century BC; eight of them are in Greek and seven in Demotic (three of the Demotic texts, **2**, **10**, and **13**, also have a docket in Greek at the foot). They were among the earliest papyri to be discovered in Egypt and are astonishingly well preserved. As they were all found together, they can properly be described as an 'archive'. All the Greek texts have already been published, some, indeed, by Peyron as long ago as 1826, and all were included in Wilcken's magisterial *Urkunden der Ptolemäerzeit*. The republication in the present volume is in lavish format and includes for the first time plates of all the texts. This will prove of great value to the palaeographical study of papyri of the Ptolemaic Period. For each text, Pestman gives a thorough physical description and an analysis of the content; the text and translation follow, after which there are notes on individual points. Points of reading are indicated in footnotes to the texts, but the grammar is not systematically 'corrected'. It is instructive to compare these editions with those of Wilcken. Pestman's comments can for the most part be regarded as complementary to those of Wilcken, but it is notable that in not a few places he is able to throw new light on old problems, partly because of the very thorough way in which he has studied the texts, and partly from his ability to bring in his knowledge of the Demotic papyri.

The general introduction (pp. i–xxix) discusses the profession of the *choachytes* (the correct Greek spelling is χοαχύται not χολχύται as was once thought); those known from the Theban area for the third and second centuries BC were also παστοφόροι Ἀμενώφιος τοῦ ἐν τοῖς Μεμνονείοις. The *choachytes* occurring in the present volume belonged to four different families, all of whom lived in Memnoneia but had a jointly-owned 'casa' at Thebes (see below).

Of the Greek texts **3–5** are petitions. **3** (= UPZ 189) is from a female χοαχύτις, complaining to the *epistates* of the Pathyrite about the alleged seizure of her property by her step-mother. Here as elsewhere (see **4**, **5**, **9**, and **11**) restoration of the papyrus has enabled Pestman to read addresses on the back not read by Wilcken. His reading αὐτ̣[ού]ς in lines 20–21, for Wilcken's αὐτῆς, is a notable improvement. Note also his clear statement in the introduction of the different positions which obtained in Egyptian and Greek law. **4** and **5** are both complaints to the *epistrategos* Phommous by the *choachytes* alleging that the *oikonomos* is charging them more in taxes than they are liable to pay. **4** (= UPZ 191), of 111 BC, includes instructions from the *epistrategos* to the *epistates* to look into the matter, but no indication that anything was done. **5**, which is preserved in two copies (= UPZ 192–3) and dates from the following year, contains at the foot of one copy (**5B**) a note by the *epistates* ordering the appropriate action to be taken. Pestman regards **4** as a copy drawn up in the office of the *epistrategos* which was returned to the *choachytes*, who for some reason took no further action. He regards **5A** also as a copy, but **5B** as an original.

8–12 are concerned with litigation in connection with the 'casa' of the *choachytes* in Thebes. This 'casa', although called an οἰκία, was not a normal dwelling house but a 'terreno fabbricabile', in which the *choachytes* temporarily stored mummies; apart from the comments on p. 87, see note f on p. 99. In **8** and **9** (= UPZ 170 and 171) the *choachytes* are in dispute with Apollonios (**10** in Demotic also relates to this dispute), and in **11**, **11bis**, and **12** with Hermias, both of whom

claimed that they owned property which the *choachytes* were using. Pestman argues persuasively that both lawsuits concerned the same 'casa' and not different properties (as Wilcken had thought). In both suits the *choachytes* emerged victorious. **8** is a petition from Apollonios in the form of an *enteuxis* of which two copies survive; in note i on p. 99 '25 talenti' is a misprint for '5 talenti'. **9** is a contract between the parties, in which Apollonios agrees to withdraw his action.

11 (= UPZ 160) is a petition from Hermias to the *epistates*, while **11bis** and **12** (= UPZ 161 and 162) are reports of the proceedings, from 119 BC and 117 BC respectively, with the judgement of the presiding official (in both cases an *epistates*). Hermias was in the garrison at Omboi with the rank of ἡγεμὼν ἐπ' ἀνδρῶν, which Pestman takes to mean that he was an eponymous commander (see p. 123 n. 3). In **11bis** 9, but not elsewhere, he describes himself as Πέρσης, a baffling addition. It is unfortunate that the verso of **11**, now visible for the first time, is mostly illegible, since it has information which is not repeated in **11bis** and **12**. In **11** and **12** we hear of proceedings before a *strategos* also with the name Hermias. Both Wilcken and Pestman consider that he was really an *epistates* at the time and was anachronistically called *strategos* since that is the office he held later; I am not convinced that this is the correct solution to the problem. On the judicial competence of the *epistates*, see notes b, j, and y on pp. 151–4.

12 runs to no less than ten columns and is, as Pestman says, 'uno dei più imponenti documenti della papirologia greca'. It is so well written that, as Wilcken remarked of Peyron's readings, 'kaum ein paar Kleinigkeiten zu verbessern sind'; Pestman suggests one or two more slight improvements (to which should be added ῥαιδιουργίαι in VI 3). Pestman argues, against Wilcken, that in the earlier trial Hermias was not assisted by an advocate. He skilfully explains the convoluted arguments employed by both sides and in general agrees with Wilcken in thinking that Hermias' family had really owned the property at one time, but that he failed to win his case as he had no documents to prove his title. Interesting points abound in the notes, e.g. on the date of the seizure of Thebes by Hyrgonaphor (note o on p. 179); on the steps which petitioners needed to take to get their case heard (notes k on p. 182 and b on p. 184); on the legal force of ὑπάρχειν (note f on p. 188) and of ἐπίσκηψις (note d on p. 190); on inheritance rights in Egyptian and Greek law (note c on p. 192); and on the difference between κυριεία and κράτησις (note f on p. 196). Among a number of revisions to Wilcken's views note especially note f on p. 192, which solves the problem at VII 22–32, and note h on the same page which gives the right explanation of πρὸ τοῦ and so establishes the correct sequence of *epistatai* of Perithebas. On the other hand, I agree with Wilcken as against Pestman that there is no need to correct πορευόμενος in VI 13.

The Demotic texts (except for **14**, edited by Botti, *Testi demotici* I, no. 4) have never previously appeared in a full edition, although they are not entirely unknown to demoticists: apart from the inclusion of Greek dockets in UPZ, Revillout dealt with much of the material in several of his publications, and a number of texts are described by Zauzich in his *Schreibertradition*. Here, they are presented in lavish editions. Unlike the position in Greek papyrology, in Demotic studies photographs of every text published are normally considered desirable. All the Demotic texts are shown in excellent 1:1 plates at the end of the volume, but several further plates accompany the editions to illustrate particular points. The chief luxury of the presentation lies in its layout: the superb handcopies (fold-outs where necessary) face the transliterations, and for the longer texts only one hand is needed to keep copy and transliteration in view. There are marginal notes to the transliterations, as well as a series of conventional notes following them. The translations are laid out according to the sense and structure, rather than mirroring the layout of the original, and have their own set of notes. Each edition is preceded by elaborate comment on peculiarities of the scribe's orthography; here, and in the notes, very free use is made of facsimiles 'dropped in'. There is a substantial appendix on the symbol that regularly heads witness-lists on the back of Demotic contracts (Pestman regards it as a symbol, rather than a word to be read), tracing its development and illustrating how it may stand (roughly) at the same spot on the back of the papyrus as the word *ḏd*, introducing the substance of the contract, appears on the front. We are told (p. vii) that the book was produced as camera-ready copy at Leiden, and it is clear that loving care has been devoted to the presentation.

The Demotic texts (**1–2**, **6–7**, **10**, **13–14**) are mostly contracts (sales or quittances), and they relate either to the transference of the right to perform the duties of a *choachyte* for a family or

household, or to shares of a house or of tombs. **2** is a *copy* of the sale of the published papyrus P. Berlin 3101, sale and quittance of a plot of land. **1** is an 'accordo' concerning the division of an inheritance. **14** is a very interesting set of accounts relating to the embalming of an individual and to a (different) funerary cult: it is good to see this material receiving the attention it deserves.

There is a very good prosopography on pp. 237–43 (though it fails to record Selois of **3**), stemmata of the various families on pp. 245–7, and, in addition to the usual indexes, an index of references cited. In conclusion, we congratulate Pestman on a volume that exemplifies the rewards of painstaking attention to detail and of sustained study of a bilingual archive.

J. DAVID THOMAS
W. JOHN TAIT

The Plants of Pehr Forsskål's Flora Aegyptiaco-Arabica. By F. N. HEPPER and I. FRIIS. 244 × 156 mm. Pp. xii + 400, figs. in text. Copenhagen, Botanical Gardens, 1994. ISBN 0 947643 62 1 (Kew). Price not stated.

This substantial account of the flora of Egypt and Yemen is designed to be of special interest to the naturalist, most specifically the botanist. Unlike Hepper's earlier book, *Pharaoh's Flowers*, which had a broad appeal and reached out to a multidisciplinary audience, those unfamiliar with systematics will find this work dry and perhaps even difficult to use. The naturalist, however, will see it as a valuable resource.

This work is intended to be a comprehensive guide to the general botanical work of Forsskål and to the specimens held in the Herbarium Forsskalii in Copenhagen and other herbaria holding floral specimens from his Egypto-Arabia expedition. The book is essentially divided into two parts: the Introduction summarizes the trials and tribulations of Pehr Forsskål's ill-fated trip to Egypt and Yemen; the second section, which makes up fully ninety per cent of the book, is a catalogue of the Forsskål botanical collections held at the Herbarium Forsskalii, Copenhagen. Combined, these sections summarize for the first time Forsskål's botanical results from his expedition (1761–1763). Students of the flora of the eastern Mediterranean and Egypt as well as those working throughout tropical Africa will take an interest in this compilation of his botanical collections and their revised identifications and updated nomenclature.

Forsskål, one of Europe's greatest naturalists, is little known outside the botanical community. Although his expertise as a naturalist was far reaching, including mammalogy and most notably ichthyology, few know of him or of his uneasy progress through Egypt and Yemen. Anyone interested in natural history, even those not involved professionally, will find the details of his voyage most entertaining.

With funding from the Danish-Norwegian king, three scholars were chosen to lead a fact-finding mission to Egypt and the Arabian Peninsula: the Swedish naturalist Pehr Forsskål, the Hanoverian astronomer/mathematician Carsten Niebuhr and the Danish philologist Frederik Christian von Haven. Almost immediately friction erupted among the scholars as to which of them should be leader. It was finally decided that each of the three senior scholars would have equal leadership roles but that von Haven would control the finances. Interestingly, the Linnean system of nomenclature practiced universally today was not unanimously adopted as the best means to identify and catalogue the field specimens, even though two of the three expedition leaders worked under the great Swedish naturalist.

On 4 January 1761 the scholars set sail for the East Mediterranean. The first leg of their trip took them to Marseilles, where Forsskål visited several well-known botanists who, like himself,

were strong supporters of Linnaeus. With the help of these French scholars, a scheme was devised by which specimens could be sent to Linnaeus for study, a practice banned by the rules established by the financiers in Denmark.

After France, the expedition stopped at Malta, Turkey and Rhodes on its way to Egypt. Along the route and at each stop Forsskål collected fish, plants and mammals. From Rhodes the expedition sailed to Alexandria, travelled by ship to Rashid and then on to Cairo. Forsskål, often travelling in Bedouin costume, strayed from the group to collect plants. He soon learned that working independently was perilous; he was violently attacked by locals and rescued just in time by his companions. Egypt, Forsskål would write, was a dangerous and unpredictable place to work. He reluctantly settled for an alternative collecting plan and hired locals to retrieve specimens for his study. To his delight, he found the local inhabitants well-versed in the natural history of their area, and he was able to compile a substantial collection of Egyptian Delta plants.

The scholars spent a full year in Egypt while von Haven learned colloquial Arabic dialects. Once again the feud over leadership erupted, and concern was raised over von Haven's purchase of an extraordinary amount of arsenic. The crew feared that he planned to kill them all, but in reality his purchase was for pest control. Finally the group received word from their financier to continue to Yemen. On their way to Djidda they stopped at El-Tur in Sinai and eventually arrived in Yemen on 29 December 1762.

Forsskål found Yemen, at least initially, peaceful and its people accommodating, and he was able to travel and collect specimens on his own or accompanied by a local guide. On arrival at Moccha, however, the group was met with suspicion. The local customs officials demanded to see all they carried and, in the process, destroyed many preserved specimens. The discovery of a snake preserved in spirits set off claims of sorcery; the alcohol carried by the group to preserve their biological specimens was destroyed, and the scholars denied accommodation. Finally they were allowed to collect their specimens and belongings and gained access to appropriate accommodation. But Niebuhr and von Haven took ill, and after five weeks von Haven died. Niebuhr referred to the ailment, which was very likely malaria, as 'the cold'.

Unfortunately, the problems experienced at Moccha were an ominous forewarning of things to come. By late June Forsskål fell ill with 'the cold' and was too weak to work. On 11 July he died. Niebuhr and the three Europeans hired to assist the scholars pushed on. The remaining party left Yemen on 23 August but 'the cold' persisted to plague the group, and the artist Baurenfeind succumbed six days after leaving port. Two days later the camp servant Berggren died. Shortly thereafter the expedition's physician died, leaving Niebuhr the sole European survivor of the mission. Niebuhr became ill as well and spent a year in India recovering from the effects of the disease before returning overland to Copenhagen.

Niebuhr spent ten years in Copenhagen publishing the results of the expedition. First to be published were the geographical accounts, his own speciality, then an account of the zoological specimens and finally the botanical works. After publishing five books he retired, exhausted by the ordeal.

Niebuhr's final report dealing with the botanical collection was probably his most difficult task. He felt compelled to publish the material but needed a collaborator because he was not a trained naturalist. With help from an unknown associate, an account of Forsskål's work was published in 1775, but it was plagued with problems. Apparently Forsskål had written a long essay on his Egyptian Delta materials and a more abbreviated account of his Yemeni experience, but most details regarding the specimens themselves were on scraps of paper left in an unorganized fashion. Niebuhr's hired associate did not do justice to the work, and many unflattering criticisms appeared. Even Niebuhr felt betrayed by the collaborator's failure to produce a volume befitting the labours of his deceased friend.

Several attempts to compile Forsskål's collection data followed, most notably by Christensen (1922), but all are plagued by the same limitation: the lack of a thorough reassessment of Forsskål's herbaria. This criticism, however, cannot be extended to Hepper and Friis. By explicitly stating Forsskål's approach to classification and contrasting it with modern systematics as well as painstakingly comparing Forsskål's collection and identifications with modern comparative specimens, the authors have been able to update the Herbarium and its catalogue to conform

to the standards set by the International Rules for Botanical Nomenclature. This work thus represents an exhaustive, accurate and updated catalogue of the Forsskål collection.

The authors not only present a detailed description of Forsskål's collection, but also document the disposition of duplicate specimens and seeds that were sent to other herbaria and botanical gardens. Following common systematic practice, names occurring in Forsskål's original *Flora* are retained as synonyms if no longer accepted as the current taxonomic name. The catalogue is thus a reference for all botanical materials collected on Forsskål's journey (excluding algae, lichens and fungi).

One of the greatest contributions of Hepper and Friis' work is the many indices that offer a number of means by which to cross reference the various taxa. The book includes an index by taxon, an index of the earlier microfiche edition compiled in the 1960s and an index of the numbered sequence of specimens in the herbaria. With respect to the latter, the authors retain Forsskål's original numbering system but expand it to include the newly identified material, thereby avoiding the potential confusion that a new numbering system would invoke.

It should be kept in mind that the catalogue, although presented in alphabetic rather than taxonomic order, is not designed for the uninitiated. Some experience of systematic collections may be necessary to understand the entries. However, the many indices make it quite user-friendly, and scholars with even a minor background in systematics will be able to use it.

Overall, given the stated aim of the book, the volume is an excellent resource for those needing information on the Forsskål Herbarium and on the distribution of plants in Egypt and Yemen and parts of pre-industrial Europe and Turkey. Those with a background in natural history will be most comfortable using the volume, but even those with minimal experience may find sections useful for their own studies.

DOUGLAS J. BREWER

L'egittologo Luigi Vassalli (1812–1887). Disegni e documenti nei Civici Istituti Culturali Milanesi. By RINA LA GUARDIA, FRANCESCO TIRADRITTI, MICHEL PEZIN and CARLA PAGGI COLUSSI. 338 × 247 mm. Pp. 199, figs. 186. Milan, Edizioni ET, 1994. Price not stated.

The Italian Luigi Vassalli (1812–1887) has so far remained a rather obscure figure in the history of Egyptology, being remembered chiefly as an assistant to Mariette. In recent years, however, study of Vassalli's papers has thrown much new light on his career. This volume presents a biography of Vassalli and selections from his personal archive of notes, drawings and correspondence today preserved in a number of institutions in his native Milan.

The opening chapter by Rina La Guardia traces Vassalli's career in outline. The materials for writing his life are incomplete, and for the earlier years details have had to be gleaned from obituaries, accounts of Italian independence fighters and scattered references to Vassalli in the letters of his more famous correspondents and friends. Fortunately, his time in Egypt is more fully documented from his personal archive. Despite the shortcomings of the material, La Guardia has constructed an interesting narrative which shows Vassalli's life to have been more varied and eventful than those of many other Egyptologists of his day. While still a young man, he showed a keen interest in cultural pursuits — particularly painting and archaeology — and developed strong political views. As a youth he came under the influence of Mazzini and became involved in the struggles for Italian unity. As a result of his involvement in a political plot he was sentenced to death by the Austrian government, but this sentence was subsequently commuted to exile and he spent time in Switzerland, France and England. His first work in Egypt was in the area of local government but during the 1850s he became increasingly involved in archaeological activity. He met Mariette in 1853 and became his assistant in 1859, in which year he also became Keeper of the Bulaq Museum. From 1860 he worked on excavations at many sites, notably at Giza, Saqqara, Thebes, Tanis, Abydos, Dendera and Edfu. From time to time, however, Vassalli's political interests drew him back to Italy; he returned to Milan at the time of the unsuccessful 1848 revolt and left Egypt again in 1860 to take part in Garibaldi's expedition. This was followed by a short-lived appointment as Keeper of the National Museum of Antiquities at

Naples, after which he returned once more to Egypt, continuing to work at the Bulaq Museum but also enriching the Egyptian collections at Naples with skulls and specimens of mummy cloth from the excavations in which he had participated. He finally retired and left Egypt in 1884, spending the remainder of his life in Milan and Rome, where he committed suicide in 1887. Appended to La Guardia's chapter is a catalogue of letters and notes on which a large part of the biography is based.

After Vassalli's death his papers passed to several museums in Milan. For the Egyptologist the most important of these documents is an album of notes and drawings today preserved in the Civica Biblioteca d'Arte at the Castello Sforzesco. The second chapter of the book, by Francesco Tiradritti, presents a full description of the album with a complete list of its contents and valuable indices of names, titles and objects in museums. The book's 127 pages contain pencil and watercolour sketches and copies of monuments and objects seen or discovered by Vassalli during his work for the Service des Antiquités, chiefly in the 1860s. Though unsystematically organised, they show careful attention to detail, and are of great value in view of the subsequent disappearance or deterioration of some of the objects. Among the most important of these drawings are those which show coffins and other items of funerary equipment discovered in the Theban necropolis in 1862–3. They throw light on the discoveries Mariette's workers were making at two locations in particular, Dra Abu el-Naga and Deir el-Bahri. At the former site numerous burials of the Seventeenth and early Eighteenth Dynasties came to light. Vassalli's notes are of great value in clearing up confusion surrounding the attribution of objects found in the tomb of 'Aqhor', besides preserving sketches and descriptions of coffins which have now been totally lost. At Deir el-Bahri he made careful copies of several coffins belonging to relatives of Montemhat who had been buried within the precinct of the temple of Hatshepsut during the Twenty-fifth and early Twenty-sixth Dynasties. The drawings provide crucial evidence for the stylistic development of coffins at this period, while the inscriptions have furnished new data on the family connections of Montemhat. Vassalli's annotations also help to elucidate the confusion surrounding the date of discovery of the so-called 'burials of the priests of Montu' (which besides the relatives of Montemhat also included many members of the Besenmut family) during the 1850s and 1860s. Particularly interesting are his references to a *Catalogo di Gournah*, evidently a register of finds made in these Theban excavations, which has not yet come to light. Tiradritti has reconstructed part of this catalogue from the references made in Vassalli's album.

The third section of the book reproduces the illustrations from the two volumes of the *Panthéon Égyptien*, a collection of pencil drawings of Egyptian deities dedicated by Vassalli to his friend Constantin Beserianni in 1879. The majority of the drawings are copies of illustrations published in earlier books, notably Champollion's *Panthéon* (1823–31), supplemented by drawings of objects in the Bulaq Museum. They are of relatively little interest to the Egyptologist, yet the hundred illustrations have been reproduced in their entirety — a rather frustrating excess, since the much more valuable drawings of the *Album di disegni* are represented only by a selection.

The final chapter is an overview of Vassalli's collection of textiles, numbering about 250 samples and now housed in the Civiche Raccolte d'Arte Applicata ed Incisioni. The majority are portions of mummy wrappings from burials excavated at Giza, Saqqara, Tanis, Dra Abu el-Naga and Deir el-Bahri, and among them are well-preserved specimens from the pyramids of Unas, Pepy I and Merenre I. Since most of the samples are carefully labelled with date and provenance, the value of the collection as a potential research tool is greatly enhanced. Full study of this material has yet to be carried out.

This well-produced book provides some tantalising glimpses of an important Egyptological archive which has only just begun to be exploited. One looks forward with keen anticipation to fuller publication of this rich and fascinating material.

JOHN H. TAYLOR

Other books received

1. *Ancient Nubia.* By P. L. SHINNIE. 195 × 255 mm. Pp. xvii + 145, pls. 32, figs. 31, maps 10. London and New York, Kegan Paul International, 1996. ISBN 0 7103 0517 6. Price £45.00.

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3. *Wine and Wine Offering in the Religion of Ancient Egypt.* By MU-CHOU POO. 195 × 253 mm. Pp. xvii + 187, figs. 16. London and New York, Kegan Paul International, 1995. ISBN 0 7103 0501 X. Price £65.00.

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5. *The Night Sky in Egyptian Mythology.* By JOSEPH BRADSHAW. 148 × 206 mm. Pp. 182, figs. 50. London, privately printed, 1997. Price not stated.

6. *Puritans in Babylon. The Ancient Near East and American Intellectual Life, 1880-1930.* By BRUCE KUKLICK. 163 × 242 mm. Pp. xiii + 253, figs. 16, maps 3. Princeton, Princeton University Press, 1996. ISBN 0 691 02582 7. Price $29.95.

7. *The Horizon of Khufu. The Pyramids of Giza and the Geometry of Heaven.* By ROBIN COOK. 215 × 300 mm. Pp. 206, ills. in text. London, Seven Islands, 1996. ISBN 0 9518576 2 2. Price not stated.

8. *Das Heiligtum des Heqaib auf Elephantine. Geschichte eines Provinzheiligtums im Mittleren Reich.* By DETLEF FRANKE. Studien zur Archäologie und Geschichte Altägyptens Band 9. 210 × 298 mm. Pp. xvi + 289, pls. 12. Heidelberg, Heidelberger Orientverlag, 1994. ISBN 3 927552 17 8. Price not stated.

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13. *La Poesía Erótico-Amorosa en el Egipto Faraónico.* By ESTEBAN LLAGOSTERA CUENCA and XESUS RABADE PAREDES. 150 × 210 mm. Pp. 151, figs. in text, 1 map. Ferrol, Esquio, 1995. ISBN 84 86046 72 6. Price not stated.

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22. *Corpus Antiquitatum Aegyptiacarum. Allard Pierson Museum Amsterdam. Fascicle* III. *Stelae and Reliefs.* By WILLEM M. VAN HAARLEM. 210 × 298 mm. Pp. xiii + 102, drawings 20, photographs 54. Amsterdam, Allard Pierson Museum, 1995. ISBN 90 71211 24 X. Price not stated.

23. *Aspects of Early Egypt.* Edited by JEFFREY SPENCER. 210 × 296 mm. Pp. viii + 174, pls. 32, figs. in text. London, British Museum Press, 1996. ISBN 0 7141 0999 1. Price £30.00.

24. *How Writing Came About.* By DENISE SCHMANDT-BESSERAT. 180 × 255 mm. Pp. xii + 193, figs. 33, maps 3, tables 5. Austin, University of Texas Press, 1996. ISBN 0 292 77704 3. Price $19.95.

25. *Disease.* By JOYCE FILER. 170 × 240 mm. Pp. 112, figs. 69, colour ills. 8, maps 1. Austin, University of Texas Press, 1996. ISBN 0 292 72498 5. Price $18.95.

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