DESK BASED ASSESSMENT FOR THE TEMPLE SITE OF KOM OMBO, ASWAN GOVERNORATE

(Annex to Final Report)

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ARCHAEOLOGICAL ASSISTANCE TO THE GROUNDWATER LOWERING PROJECTS AT KOM EL-SHUQAFA AND KOM OMBO

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1 NON-TECHNICAL SUMMARY

This program is made possible through a grant awarded to the American Research Center in Egypt (ARCE), on September 30, 2014 by USAID/Cairo. The objective of the program is to provide expert archaeological advice throughout the design of groundwater lowering (GWL) systems for two archaeological sites in Egypt, namely Kom Ombo, in Aswan Governorate and the Catacombs of Kom al-Shuqafa in Alexandria Governorate.

To accomplish this objective, ARCE provided an archaeological support team to work closely with CDM Smith, the engineering firm designated by USAID to implement the GWL project, in coordination with the Ministry of Antiquities (MoA), and USAID to ensure that archaeological elements are seriously considered during the early phase of designing GWL systems at both sites.

The aim of the GWL project at Kom Ombo is to lower the ground water level beneath the temple and its surroundings. Although there is no standing water within the temple, the walls and floors of the temple are moist, contributing to an advanced degradation of the monument.

CDM Smith outlined an engineering proposal for the Ground Water Lowering Project that involves extensive ground penetrating works. These include a number of Capillary Break Trenches, Groundwater Collection Trenches, a Discharge Force Main Trench, wells, manholes, a pump station and a control building.

This report aims to identify and assess such archaeological remains as may be threatened by the scheme of works associated with the Ground Water Lowering Project. During the assessment period interpretation of the researched archaeological baseline data was provided to CDM Smith to aid in their design of efficient groundwater lowering engineering works. With known locations of potential heritage assets, ARCE and CDM Smith have worked together to reduce negative impacts to those heritage assets.

The archaeological baseline data presented in this report have been collected using a number of resources including library/archives research, official archaeological reports, interviews, maps and photographs, previous geotechnical reports, the authors' own recording of visible remains at the site, survey, geotechnical data collection (test pits, boreholes and piezometers), and geophysical survey.

Within the report, the archaeological baseline data are organized into nine spatial zones (Zones 1-9) to facilitate the accessibility of information. Section 7 describes the archaeological baseline data by spatial zone, combining the data collected from all sources. These data are summarized in Section 8, where the potential for archaeological remains and the level of their significance (local, regional, national and international) is outlined by individual zone.

The raw archaeological data collected during the course of this assessment (from the geotechnical works) are presented and interpreted in the appendices and include an archaeological assessment of the test pits dug during this period and a full ceramic report on the pottery retrieved during these excavations. These data represent a robust body of work, all the more significant since there have been no other recent systematic and recorded archaeological investigations at the temple and tell.

Research and geotechnical data collection have shown that the archaeological sequence within the temple and the surrounding tell is complex, and includes Old Kingdom and New Kingdom remains that predate the construction of the Ptolemaic Temple. Data have also shown that the Ptolemaic and later remains are substantial, relating to various phases of development of the temple and, of course, the surrounding settlement now represented by tell.

The archaeological remains at Kom Ombo are of international, national, regional and local significance. Section 9 considers the individual items within

the proposed ground water lowering design and what the potential impacts may be on buried archaeological deposits. ARCE recommends that archaeologists (with firm backgrounds in commercial archaeology environments) are present at **ALL** times during the engineering works. ARCE recommends that all ground penetrating works encountering archaeology be excavated by hand, by archaeologists. The archaeological remains should be recorded using best-practice methods and the results of these excavations should be published in an appropriate journal.

2 INTRODUCTION

2.1 Outline

This program is made possible through a grant awarded to the American Research Center in Egypt (ARCE), on September 30, 2014 by USAID/Cairo. The objective of the program is to provide expert archaeological advice throughout the design of groundwater lowering (GWL) systems for two archaeological sites in Egypt, namely Kom Ombo, in Aswan Governorate and the Catacombs of Kom al-Shuqafa in Alexandria Governorate.

To accomplish this objective, ARCE provided an archaeological support team to work closely with CDM Smith, the engineering firm designated by USAID to implement the GWL project, in coordination with the Ministry of Antiquities (MoA), and USAID to ensure that archaeological elements are seriously considered during the early phase of designing GWL systems at both sites.

An Archaeological Desk-Based Assessment is an important first stage in the planning process, assessing the presence and potential for archaeological remains. Ideally an assessment should be researched and produced in parallel with the creation of specific engineering and development plans. In doing so, potential impacts to archaeological remains can be minimized as well as strategies developed early on, to mitigate damage to the historic environment. The report has been carried out following the standards specified by the Chartered Institute of Field Archaeologists (2014).

As part of CDM Smith's geotechnical data collection a series of test pits were excavated and boreholes, piezometers and a pumping test wells were drilled between 1 March 2015 and 3 August 2015. ARCE archaeologists Hussein Rekaby, Mohamed Ahmed El-Khateeb and Essam Shehab excavated and recorded these investigations alongside the CDM Smith engineers. The data from these are integrated within this report and are also presented as excavation reports in Appendices 2 and 3. A geophysical survey was also conducted by Dr. Karam, Helal Group for Geotechnical, Geological,

Geophysical Services, contracted by CDM Smith. The site was also surveyed by the CDM Smith surveyor. These survey data were shared with ARCE, and form the basis for some of the maps produced within this report.

2.2 Aims and Objectives of Assessment

A detailed Scope of Work was prepared prior to the start of the Assessment Period stating specifically that ARCE would 'provide expert archaeological advice throughout the design of groundwater lowering (GWL) systems' at Kom Ombo (see Appendix 1).

This report aims to identify and assess such archaeological remains as may be threatened by the scheme of works associated with the Ground Water Lowering Project.

During the assessment period interpretation of the researched archaeological baseline data was provided to CDM Smith to aid in their design of effective groundwater lowering engineering works. With known locations of potential heritage assets, ARCE and CDM Smith have worked together to reduce negative impacts to heritage assets in their next stage implementation of engineering works.

A Desktop Assessment should form the first stage in the process of archaeological assessment and may, if the quality of the archaeology and the perceived threat warrants it, be followed by further mitigation measures.

2.3 Data Collection

Research for this report has included the following:

Data Collection (research): The research element of the data collection has included library/archives research, obtaining official archaeological documents, interviews, locating relevant maps and photographs, obtaining previous geotechnical reports, locating previous archaeological archives.

- Library/Archives Research. This part of the data collection was completed early on in the project. As was expected, locating relevant published articles, books, drawings and photographs was not a straightforward task. The team searched for materials at the ARCE library, the GIS Centre (Zamalek), Institut Français d'Archéologie Orientale (IFAO, Cairo), Deutsches Archäologisches Institut (Cairo), the Nile Protection Centre (Aswan), MoA archives (Cairo), and on the internet. Through this research we compiled a bibliography and took copies of all relevant material. All this material has been read and is referenced within this report.
- Official archaeological reports: although there have been archaeological investigations within the Kom Ombo area over recent decades very few reports were traced to the Aswan and Kom Ombo inspectorate, or in the Zamalek archives. Many of these reports had been mislaid, especially since the 2011 uprising.
- Interviews: since many official reports are missing, the team tracked down and interviewed MoA inspectors who were present during past excavations at Kom Ombo. Through these interviews the team were able to gather data on past excavations. The team also interviewed farmers and local landowners in the fields around the Kom Ombo site. These were an extremely informative resource, providing the team with information on changes to canals, drains and crops within the area.
- Maps and photographs: the team was able to access a selection of maps at the Survey of Egypt offices in Cairo and were also able to access published maps. The team was able to locate a large number of historical photographs online, in publications and in other archives.
- Previous Geotechnical reports: CDM Smith provided the team with data from previous boreholes located near the site and the results of a geophysical survey. These data are integrated with their archaeological implications in this report.

Data Collection (geotechnical). As already noted, the ARCE team recorded a series of boreholes, test pits and piezometers. From an archaeological

perspective the results from these have been extremely significant and form a major contribution to the archaeological knowledge of the site.

On Site Data Collection: Full photographic survey of the site and nearby sites together with the recording and survey of the existing archaeological remains and landscape.

- Full photographic survey. The DBA team has been working on a full photographic survey of the temple and the surrounding tell.
- The ARCE team has prepared copious records on the surviving archaeological remains as well as the existing landscape and signs of the historical landscape of the area.

2.4 Consultations with CDM Smith

CDM Smith and ARCE have collaborated during the course of the project with ARCE providing archaeological advice to inform the creation of the ground water lowering engineering design. This has taken the form of various meetings (in person, by telephone, and via Skype). After CDM Smith's initial engineering design, ARCE produced an Impact Mitigation Assessment, which assessed the individual impacts to archaeological remains. Based on this, and subsequent meetings, the design was slightly altered, and a second engineering design was developed by CDM Smith. During the course of the project ARCE team members produced weekly reports, which they circulated with CDM Smith, detailing progress and results of their research.

3 THE SITE

The archaeological site of Kom Ombo covers an area approximately 575m (NW-SE) by approximately 300m (NE-SW) (Figures 1 and 2). The site is located at 492740 E/2704280 N (UTM). The Nile bounds the site to the west, agricultural fields bound the site the south, El-Biyara Temple Street and a Sugar Cane Railway bound the site to the east and the MoA storage magazine bounds the site to the north (Figures 3 and 4). The site includes the standing monuments of the Ptolemaic and Roman period temple, a substantial ancient mudbrick enclosure wall bounding the temple to the northeast and southeast and a modern mudbrick enclosure wall to the northwest. To the northeast and southeast of the enclosure wall the ancient tell (stratified ancient settlement remains) survives approximately 15 m above the floor level in the temple (Figures 5 and 6). Judging from the mound visible at the modern ground surface, the tell in this area covers an area approximately 190m (N-S) by approximately 140m (E-W). Previous excavations have exposed areas of mudbrick architecture on the tell, particularly in the area to the southeast of the temple. The site was significantly redeveloped between 2002 and 2010 and most of the modern constructions to the west of the temple were added during this program.

Access to the site is via El-Ma'bad (Temple) Street. The street terminates at a large car park from where visitors walk through a security gate to Kom Ombo Temple Street. In front of the temple, the street forms a lower terrace (formerly in the Nile embankment below the ground level of the temple). Steps and a ramp lead from here up to the temple precinct. This terrace/street continues to the north between the Nile terraces and the site. To the east of this a ramp leads from the temple precinct terrace, down to the Crocodile Museum. This is a rectangular building to the northwest of the temple. Mummified crocodiles and associated artefacts are displayed here. To the southwest of this and southwest of the temple there is a second, lower terrace below Kom Ombo Temple street. Here, an area 137m (N-S) by 80m (E-W) is filled with bazaars and restaurants. To the west of this there are terraces that lead down to the Nile forming an area where cruise ships are able to dock.

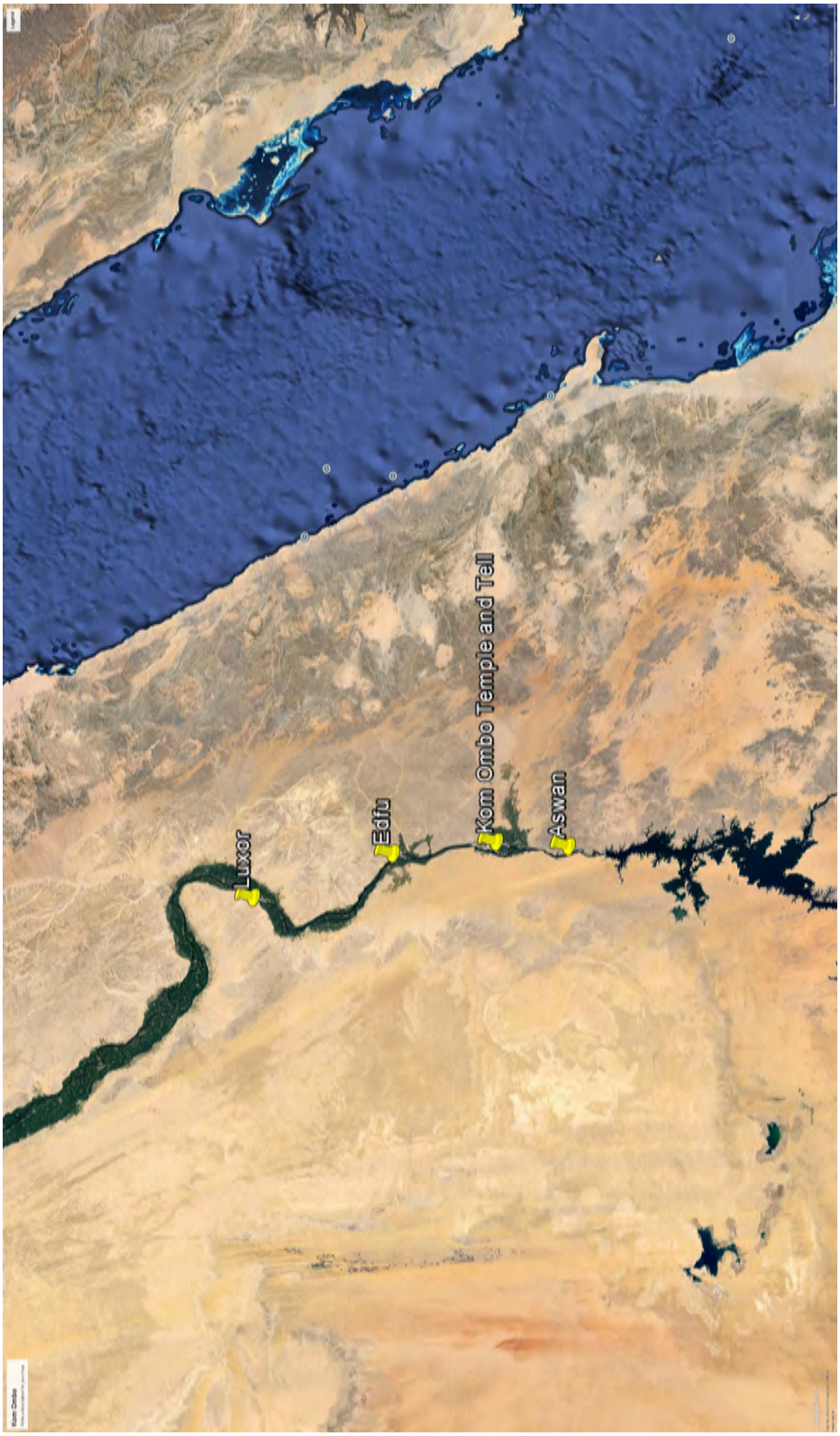


Figure 1. Location of Kom Ombo Temple: Google Earth (27 November 2015)

Figure 2. Location of Kom Ombo Temple: Google Earth (27 November 2015)

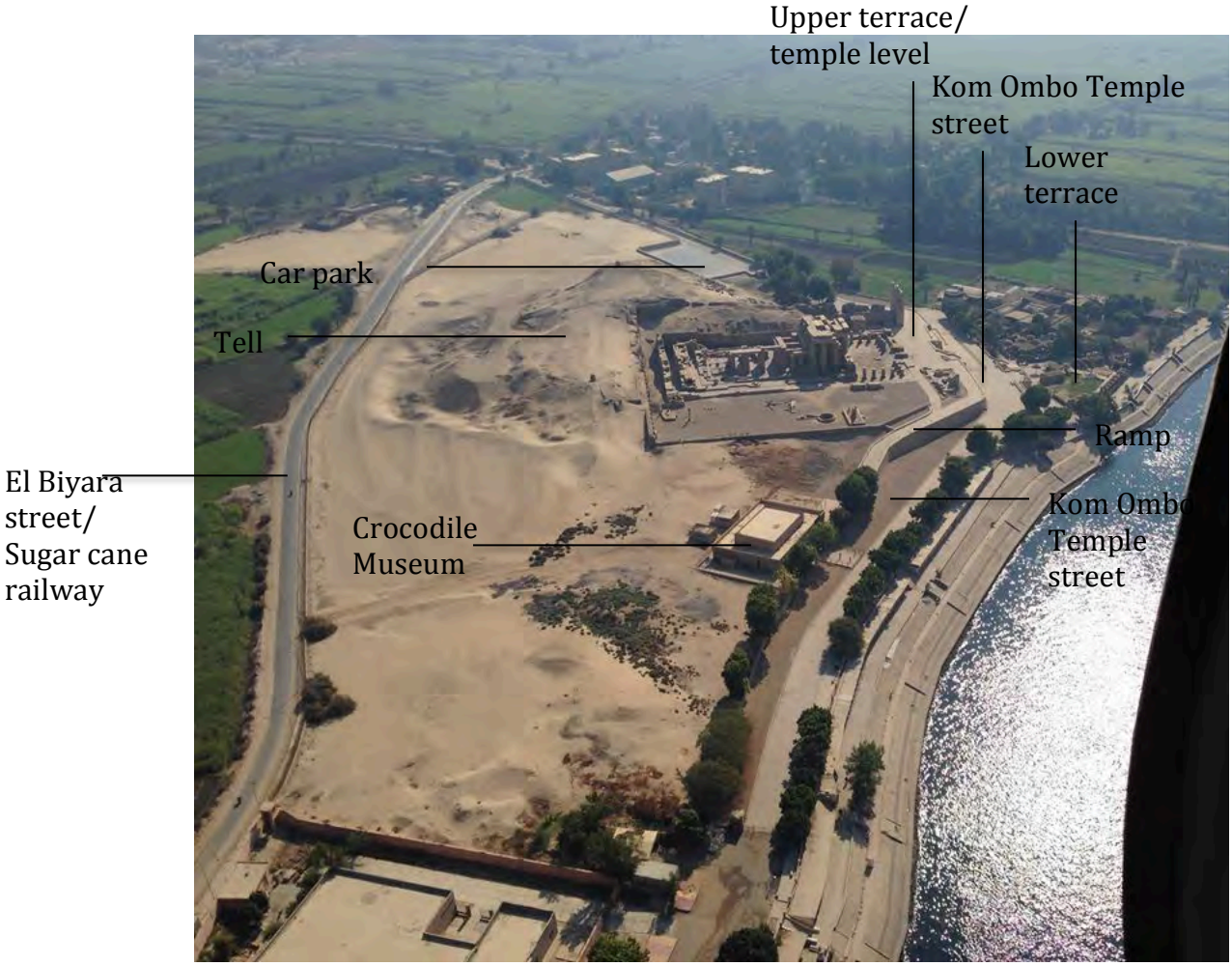


Figure 3. Aerial photograph of the site of Kom Ombo taken in 2013

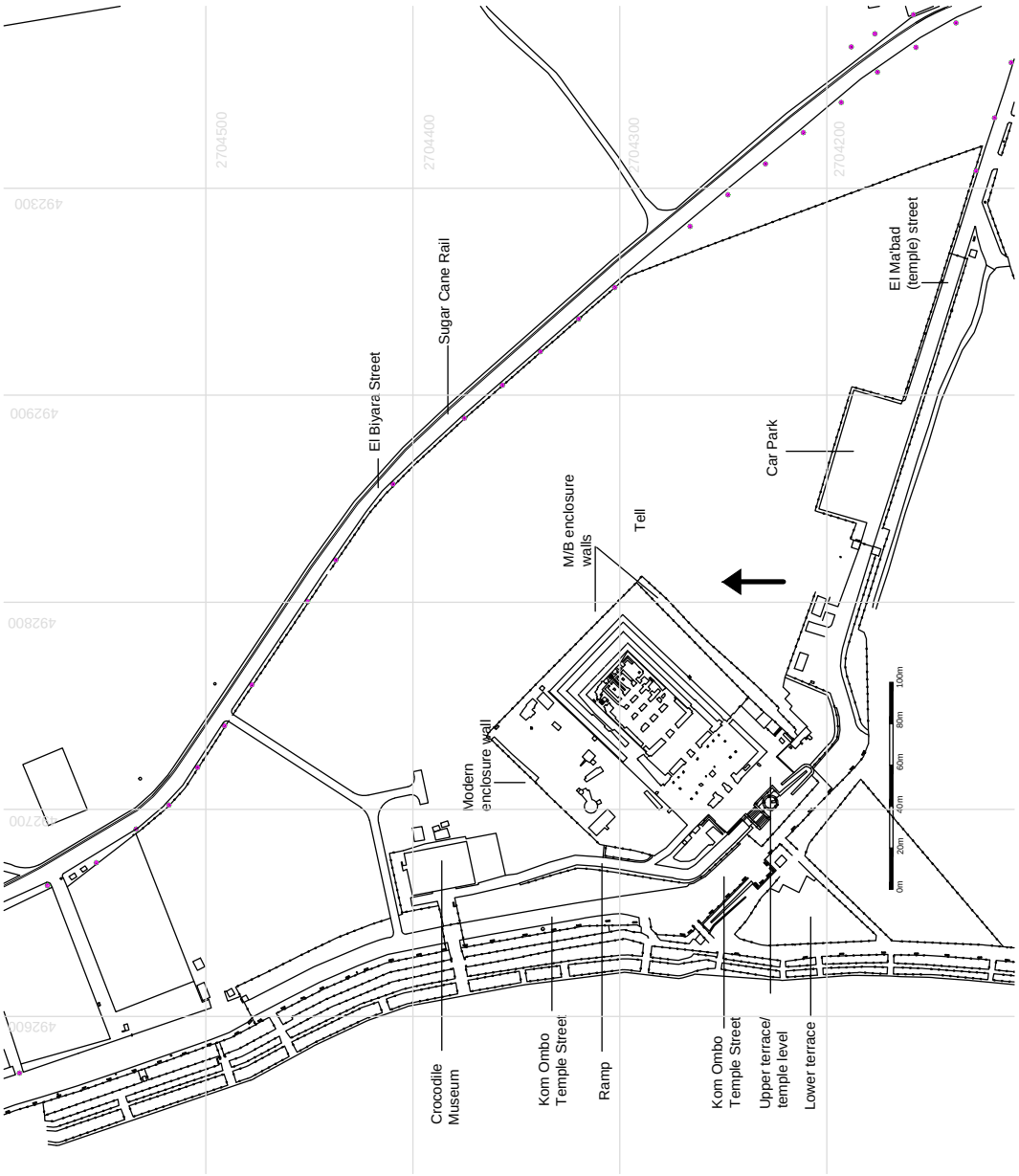


Figure 24. Plan of Kom Ombo using the 2015 survey data

Figure 5. Contour map of Kom Ombo and the area around the temple and tell. Produced using CDM Smith survey data.

Figure 6. Contour map of the area around the Kom Ombo tell: NE facing. Produced using CDM Smith survey data.

4 THE GROUNDWATER LOWERING PROJECT: PROPOSED SCHEME OF WORKS

CDM Smith has developed a draft engineering design for lowering the ground water level at the site of Kom Ombo. This section itemizes the individual ground penetrating works proposed within the design based on a draft submitted by CDM Smith on 3 September 2015 (Figure 7). The potential impacts of these works on archaeological remains are discussed in Section 9.1.

4.1 The Proposed Works

The scheme lists the following ground penetrating works - all have the potential to impact on archaeological remains:

Capillary-break trench. The proposed capillary-break trenches are extensive. These include trenches proposed around the outer walls of the temple, around the inner perimeter of the Forecourt, around the columns and altar within the Forecourt, and around the pylon and the southern wall of the Open Court, around the Birth House, the Hathor Chapel, the West Gate and Nilometer to the west of the Forecourt, the wells and Crocodile Basin within the Open Court. The proposed trench will be 0.90m wide and will reach the depth of the temple's foundations.

In the Forecourt CDM Smith proposes lifting each block and removing the moist clay beneath, replacing it with capillary break sand.

Groundwater Collection Trenches. These cover a vast area and would encircle the temple, which includes part of the tell. The proposed trenches are about 1.5m wide by 7m to 9.5m deep.

A Discharge Force Main. The trench for the construction of the Force Main will be about 1.5m deep.

Pump Stations. These are connected to the Discharge Force Main. There are currently three pump station locations proposed. These will be 10m deep and have no above ground structure. At the ground surface they will resemble manholes.

Manholes. Eleven manholes are proposed lying along the route of the Groundwater Collection Trenches. These will be about 2m in diameter by 8m to 10m deep.

Relief Wells. Relief Wells (number and size to be determined) will be installed at selected locations along the route of the Groundwater Collection Pipes. They will be placed in the footprint of the deep collection trenches and the heads buried inside the trench. Drill diameters will be between 20cm to 45cm with depths of about 20m to 25m.

Control Building. An above-ground control building is proposed, just to the east of the Crocodile Museum. The depth of excavation for the control building will be about 1m to 1.5m deep.

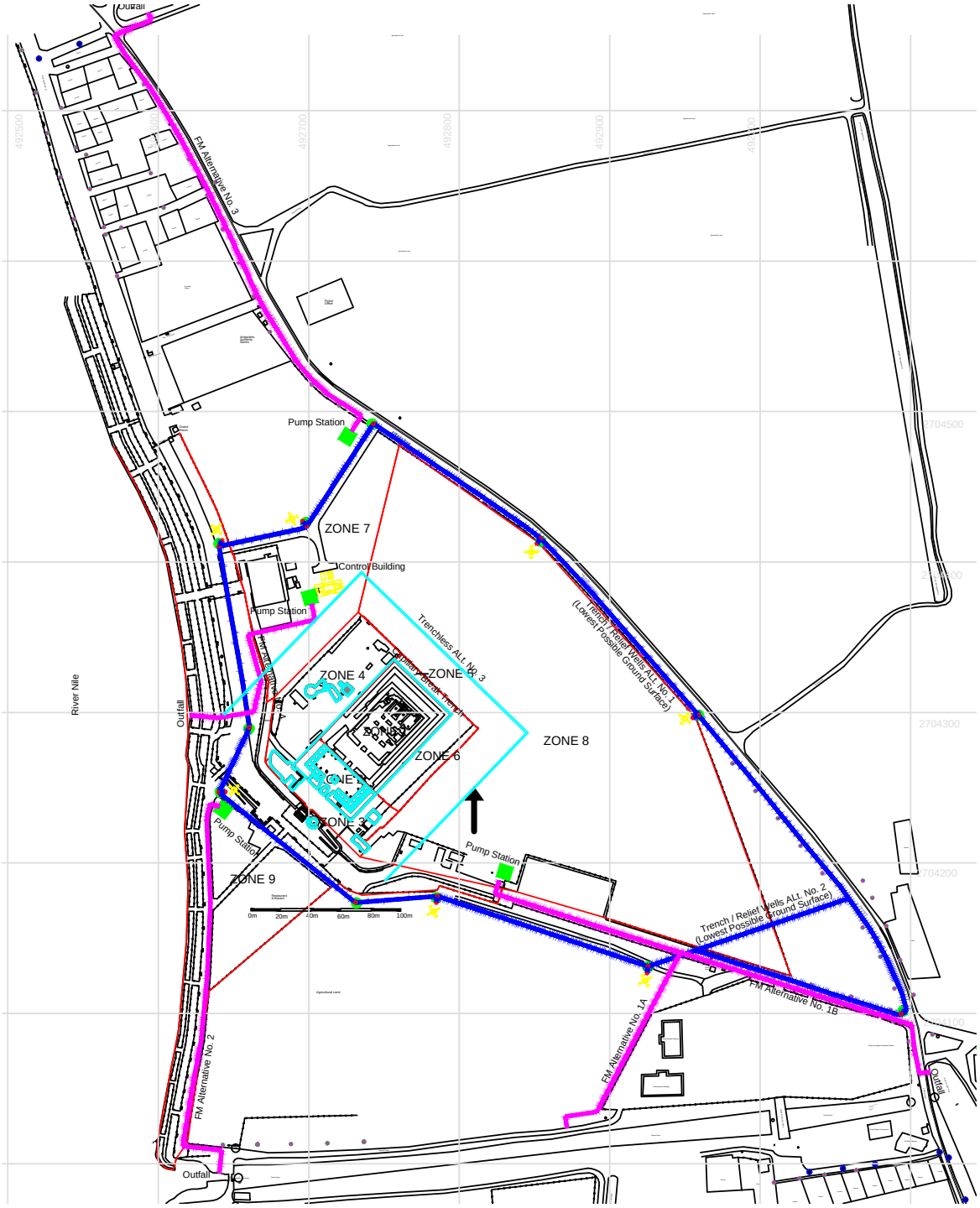


Figure 7. Draft Proposed Ground Water Lowering Scheme developed by CDM Smith: 3 September 2015.

5 STATE LEGISLATION AND INTERNATIONAL GUIDELINES RELATING TO PROTECTION OF HERITAGE SITES

The site of Kom Ombo comprising the temple and tell is a registered site. Its protection is enshrined in Law No.117 of 1983 (As Amended by Law No.3 of 2010 Promulgating the Antiquities' Protection Law) (Ministry of Culture, Supreme Council of Antiquities: 2010)[1].

Any development, conservation, excavation within a registered antiquities site is subject to the Law's heritage policies:

Article 29 'The Council is charged with taking care of antiquities, museums, stores, and archaeological sites and areas and historical buildings besides the guarding of such through the competent police, and special watchmen and guards commissioned by the stated Council in accordance with the rules regulating such. The Council shall put a maximum limit for the extension of every inspection of antiquities in a way guaranteeing the ease of movement of such inspection in their area and enabling it to supervise its antiquities.

By a decree from the Board of Directors. the border of every archaeological site guarded by the Council shall be defined'.

Article 30 'The Council and no other shall be concerned with the execution of maintenance and restoration work necessary for all registered antiquities and archaeological sites and areas and historical buildings.

[1] This references the English translation. The Arabic original takes precedence.

After the approval of the Competent Permanent Committee, Chairman of Council's Board of Directors may license competent authorities and scientific missions to undertake operations of restoration and conservation under the Council's supervision. Also specialized individuals may be given the license in writing to undertake such operations'.

Article 31 The Council shall arrange priorities of permission for missions and authorities to excavate antiquities starting with places that are more subject to the environmental dangers and more affected by the State's projects of urban extension in accordance with an objective timetable that is decided by the Board of Directors.

Article 27 'The Council undertakes preparing the registered archaeological places and sites and historical buildings for visit or study in a way that is not incompatible with their security and preservation. The Council also aims at revealing the aesthetic and historic characteristics and distinguishing features of the same.

The Council thereto employs the capabilities of archaeological sites and museums in developing archaeological awareness by all means'.

Article 20 In accordance with special conditions set by Supreme Council for Planning and Urban Development upon recommendation from the Minister. granting buildings licenses at archaeological sites or lands shall not be permitted.

Other parties shall be prohibited from establishing foundations or cemeteries or digging canals or constructing roads or cultivating in the same or in the public-service facilities set for antiquities or lands lying within the approved beautifying lines. Implanting

trees or the cutting of such or carrying rubble or taking soil or fertilizers or sand or the execution of any other work which result in changing the characteristics of said sites and lands shall be prohibited except with a license from the Council and under its supervision.

Provision of the previous paragraph shall be applicable on adjacent lands lying outside the scope of the sites referred to in the previous paragraph which extend to 3 (three) kilometers distance in uninhabited places or to the distance the Council determines in a way that realizes protecting the environment of the antiquity at other sites.

By a resolution of the competent Minister in culture affairs, provisions of present article may be applicable on lands of which the Council becomes evident, on the basis of studies it undertakes, of the possibility of the presence of antiquities in such. Provisions of this article shall thereto be applicable on the desert areas and places where operation of store quarries is licensed.

The site of Kom Ombo Temple and its surroundings is not a World Heritage Site

Although there are no existing heritage or archaeological site management plans operating in the area, this desk-based assessment endorses site management best practice as outlined in Managing Cultural World Heritage (UNESCO: 2013).

This assessment also recommends the use of the ‘good practice’ heritage investigation principles outlined by the Chartered Institute for Archaeologists (http://www.archaeologists.net/codes/ifa).

6 DESCRIPTION OF HERITAGE ASSETS: ARCHAEOLOGICAL AND HISTORICAL BASELINE DATA

6.1 General History of Kom Ombo

Kom Ombo is an industrial town whose economy is based on the sugar processing factory constructed in the 1920s. It is located 46 km to the north of Aswan and 18km to the south of Gebel el-Silsila on the east bank of the Nile. The modern city is located at the terminus of two caravan routes – one running westward through Kurkur Oasis to Tomas in Nubia and the other from Daraw through the eastern desert regaining the Nile at Barber (Morkot 2001:248).

The name Kom Ombo derives from its ancient pharaonic name, translated as "the golden" *Nbw* in hieroglyphs, *Imbw* in Coptic, Ombos in Greek. The modern Arabic name translates as the Mound of Ombo (Al-Tonsy 2005:4).

The Kom Ombo Basin has significance in the archaeology of the Nile valley during the late upper Paleolithic (c. 15,000 - 12,000 BCE; Morkot 2001:248). Despite the town being mentioned in inscriptions dating to both the Middle and New Kingdoms, early historical periods of the site are not well understood. The only excavated evidence of these periods is isolated blocks of stone, ostensibly from one or more temples, inscribed with the cartouches of Senusret I as well as with the names of Amenhotep I, Hatshepsut, Tuthmoses III and Ramesses II (Bianchi 2005:503). There had been a gate of Hatshepsut and Tuthmosis III in the south enclosure wall, seen in the 1820s and 1840s by Champolion and Lepsius but this has since been destroyed (Porter and Moss 1991:200). Blocks of Tuthmosis III and Ramesses III were recorded built into the Birth House (Porter and Moss 1991:199).

In the Ptolemaic period Kom Ombo became an important administrative center of the first nome of Upper Egypt in part because it commands the

heights overlooking the river from which troops could guarantee the security of Egypt's southern frontier (Bianchi 2005:503). It was also a training centre for the elephants imported by the Red Sea from Ethiopia for use in the Ptolemaic armies (Morkot 2001:248).

The construction of the present temple began under Ptolemy VI Philometor (186–145 BC) in whose reign the walls of much of the temple were decorated. Construction continued into the reign of the Roman emperor Macrinus (AD 217–18) (Bianchi 2005:504).

6.2 Archaeological Investigation/Conservation History

The temple was first recorded in the Description de l'Égypte (Charbrol and Jomard 1809:1-10). A plan of the visible features was made, as was a textual description of the visible elements of the main temple and the Birth House (Figure 8).

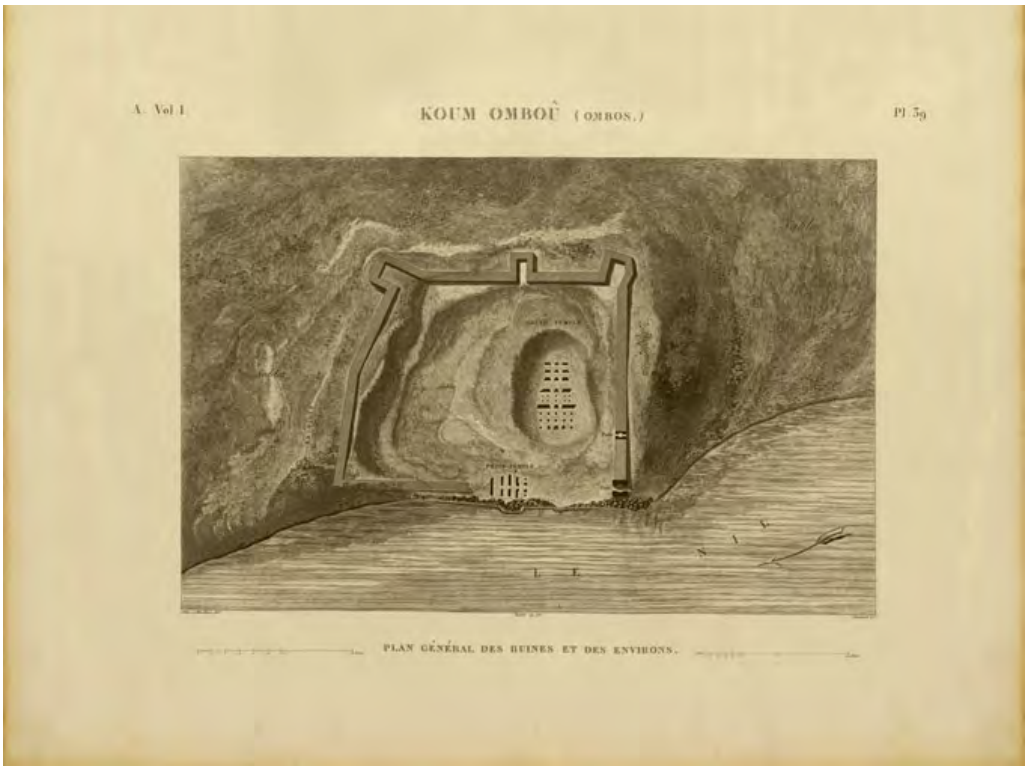


Figure 8. Plan of the ruins and environs: (Description de l'Égypte 1820: Vol 1, Pl. 39)

In 1893 the Egyptian Antiquities Service began clearing, consolidating, restoring, and recording the temple, a program that lasted some twenty years initially directed by J. de Morgan (de Morgan 1895, 1902, 1905). The work included the removal of large amounts of sand and large quantities of ancient settlement remains in the form of stratified archaeology that had created the tell around and over the temple (de Morgan 1895). Farmers were permitted to remove this material to use as *sebakh* to spread on the fields as compost. (Kemp 1985: 40). As was common at the time, this work was accompanied by very limited documentation resulting in an almost complete lack of detail of the

archaeological sequences removed. De Morgan published his study of the temple in three volumes (de Morgan 1895, 1902, 1905). He also planned the temple and produced a contour map of the surrounding tell (Figure 2) which, as Kemp demonstrated in his 1979 survey (Kemp 1985), shows the extent of the tell at the end of the nineteenth century and, by comparison, how much has been subsequently removed.

De Morgan's clearances began with the interior of the temple and some areas on either side. He constructed a new retaining wall to the northwest to hold back the unexcavated tell, and others to the southeast (Figure 9; de Morgan 1895; de Morgan 1902; de Morgan 1905). Later, after de Morgan's plan was published, there were continued clearances and restorations, which were sometimes reported in the *Annales du Service des Antiquités de l'Égypte*, for example by Carter (1903) and Barsanti (1915). A stone embankment was built in 1893 to halt the continued encroachment by the Nile (Morkot 2001:249).

Carter reported on work conducted at the temple in 1902, which included removing debris after about 30 meters of the northeastern mud brick enclosure wall at the back of the temple fell into the northeastern surrounding corridor and over the northeastern stone temple enclosure wall (Carter 1903:172-174). The debris was removed from the walls and corridor.

The clearance of the area to the northwest of the main temple was supervised by Barsanti during 1913 and 1914, who concurrently restored and consolidated a number of architectural features within the temple and the enclosure walls. He also constructed the large, buttressed outer enclosure wall to the northeast of the temple (Barsanti 1915: 175). In the area to the northwest of the temple, Basanti removed material down to the level corresponding with the pavement of the temple sanctuary, excavating through a considerable amount of stratified tell and identifying features such as small shrines, the outline of a supposed Coptic church and a system of stone-lined wells and basins (Barsanti 1915: 172-4).

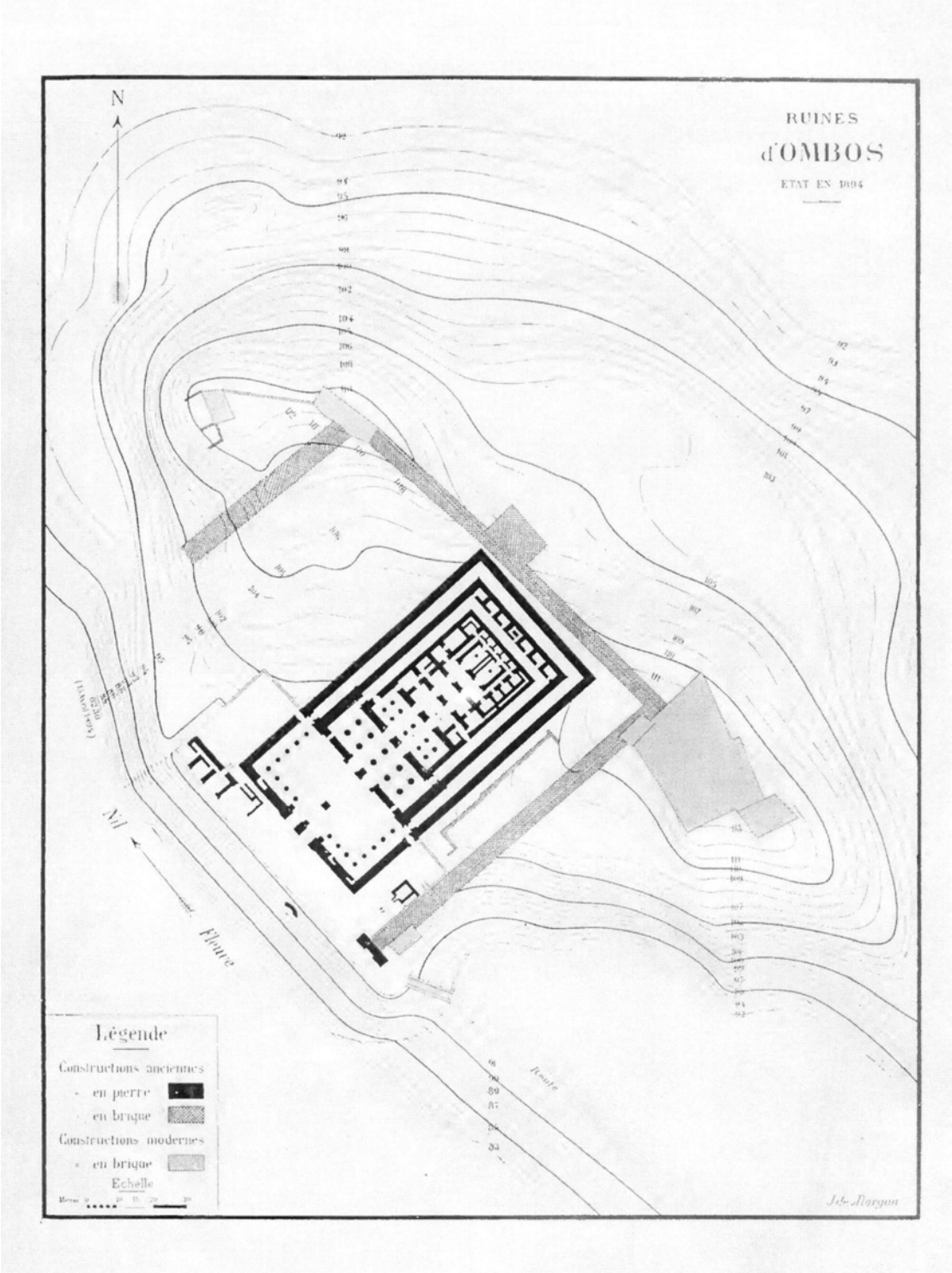


Figure 9. Plan of the temple and tell: (De Morgan 1985: frontispiece)

In 1979 Barry Kemp and Michael Jones conducted an archaeological survey of the tell (Figure 10) studying features such as exposed brick walls, surface pottery and the reddened earth to the northwest of the temple area (Kemp 1985: 39-59).

Between 1982 and 1984 Ibrahim Bashir, head of the local council of Kom Ombo City, carried out a number of developments in the area, including expanding the road in front of the temple and around the west of the temple, the construction of an embankment for mooring cruise ships, the construction of a stone enclosure wall and filling of a drain to the south of the temple.[2] This is the drain that had been planned by Kemp in 1979 (see below).

In 1986 the Egyptian Antiquities Organization (EAO) excavated to the northwest of the temple in advance of constructing an inspectorate office and rest house (Site 4 on Figure 11). To the north, a small building was also constructed which functioned as a café (owned by the EAO) for one and half years; see Figure 12 for the locations of these features including Inspectorate office and rest house, police office and café.

Between 16 September 1989 and 25 June 1990 the EAO worked on a project to remove sand from behind the temple to protect the temple from an insect infestation inside the temple and to aid in the ground water damage that was beginning to effect the temple (Site 6 on Figure 11). In doing so a large area of the mudbrick structures in the tell were exposed and partly excavated.

[2] Personal communication from el-Haab Ahmed Abu Gamal, owner of farmland beside the temple.

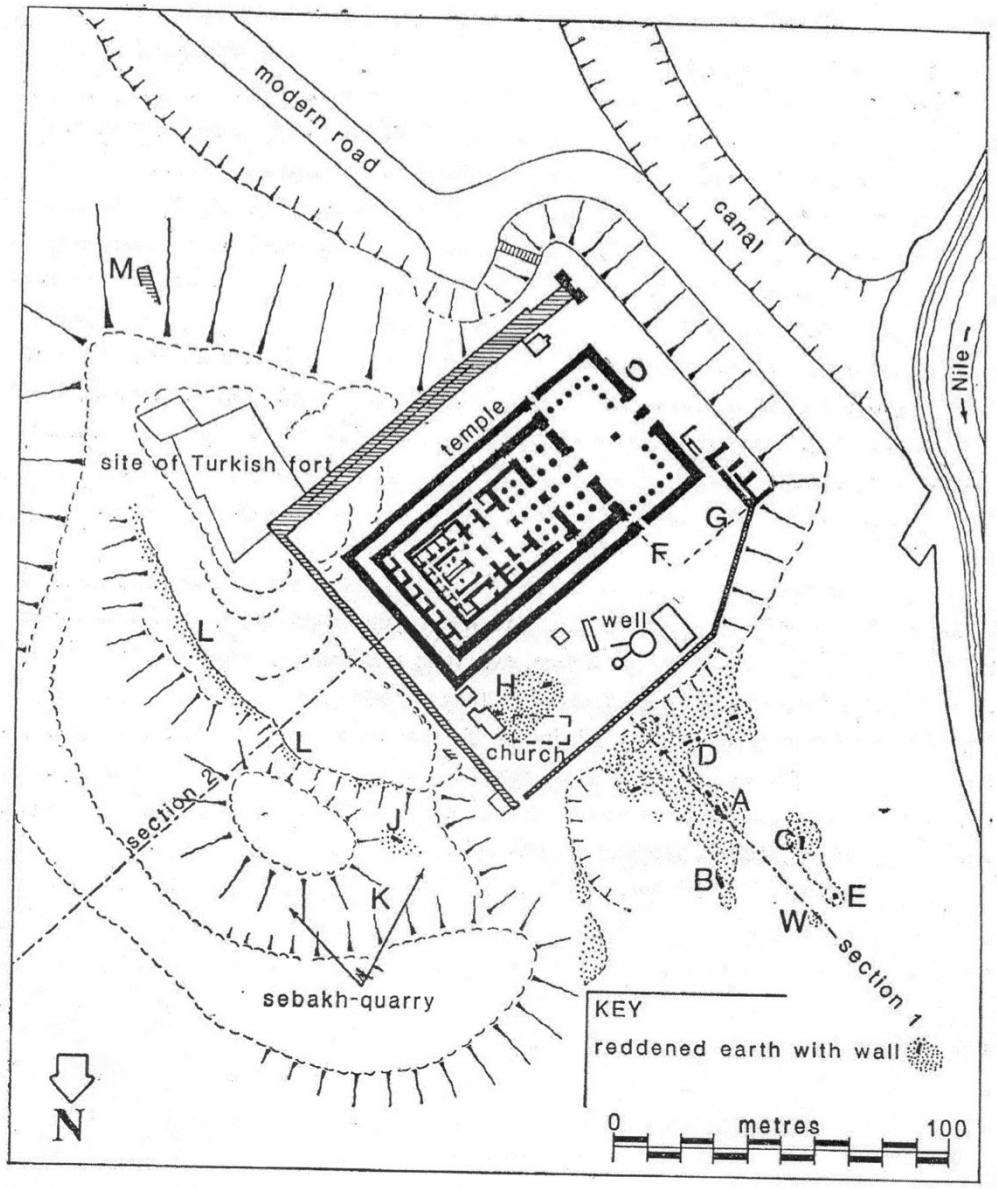


Figure 10. Kom Ombo temple and tell: (Kemp 1985: 42)

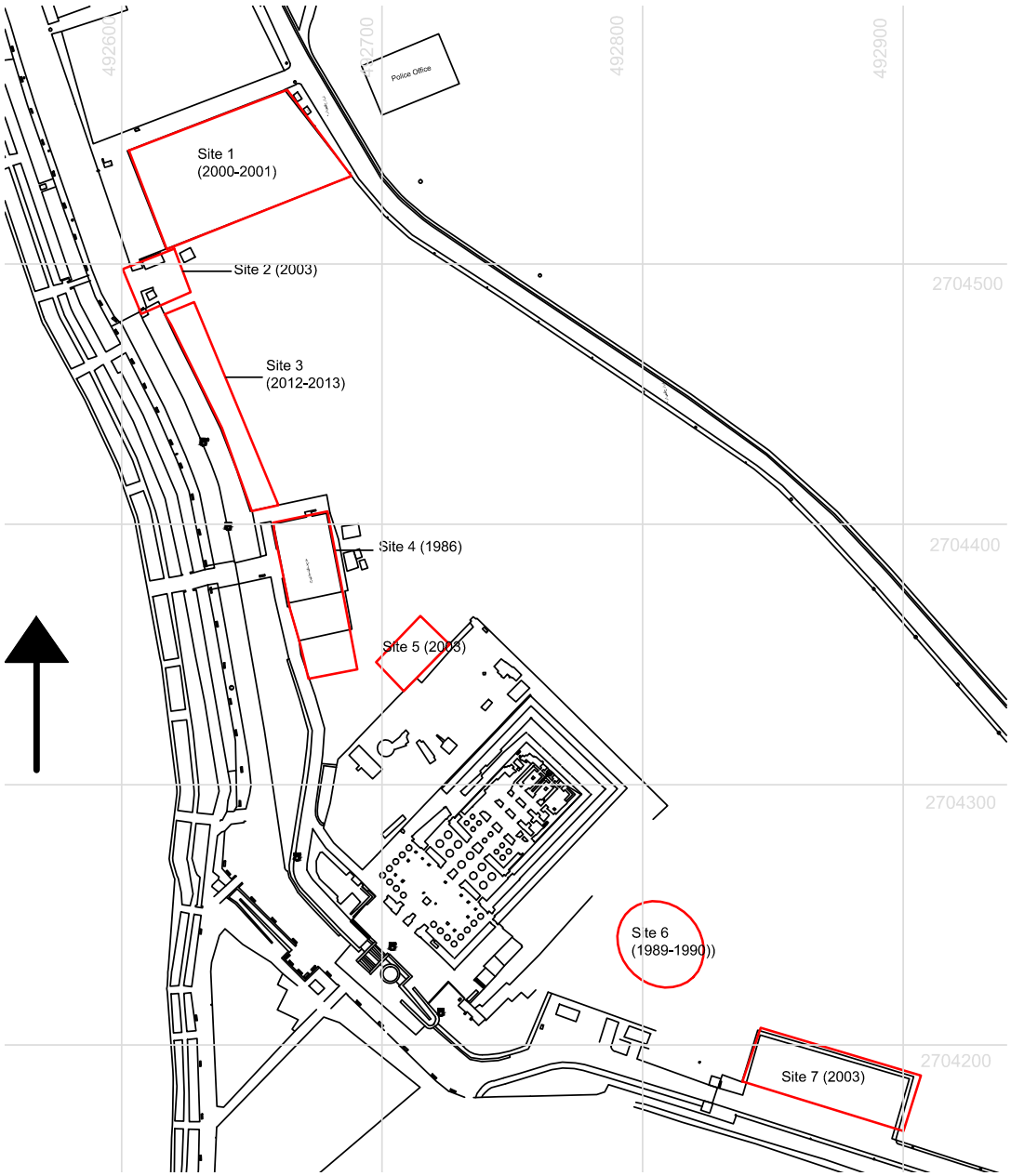


Figure 11. Location of documented excavations and archaeological investigations between 1986 and 2014. Where the locations of investigations are not precisely known they are not marked on this map.

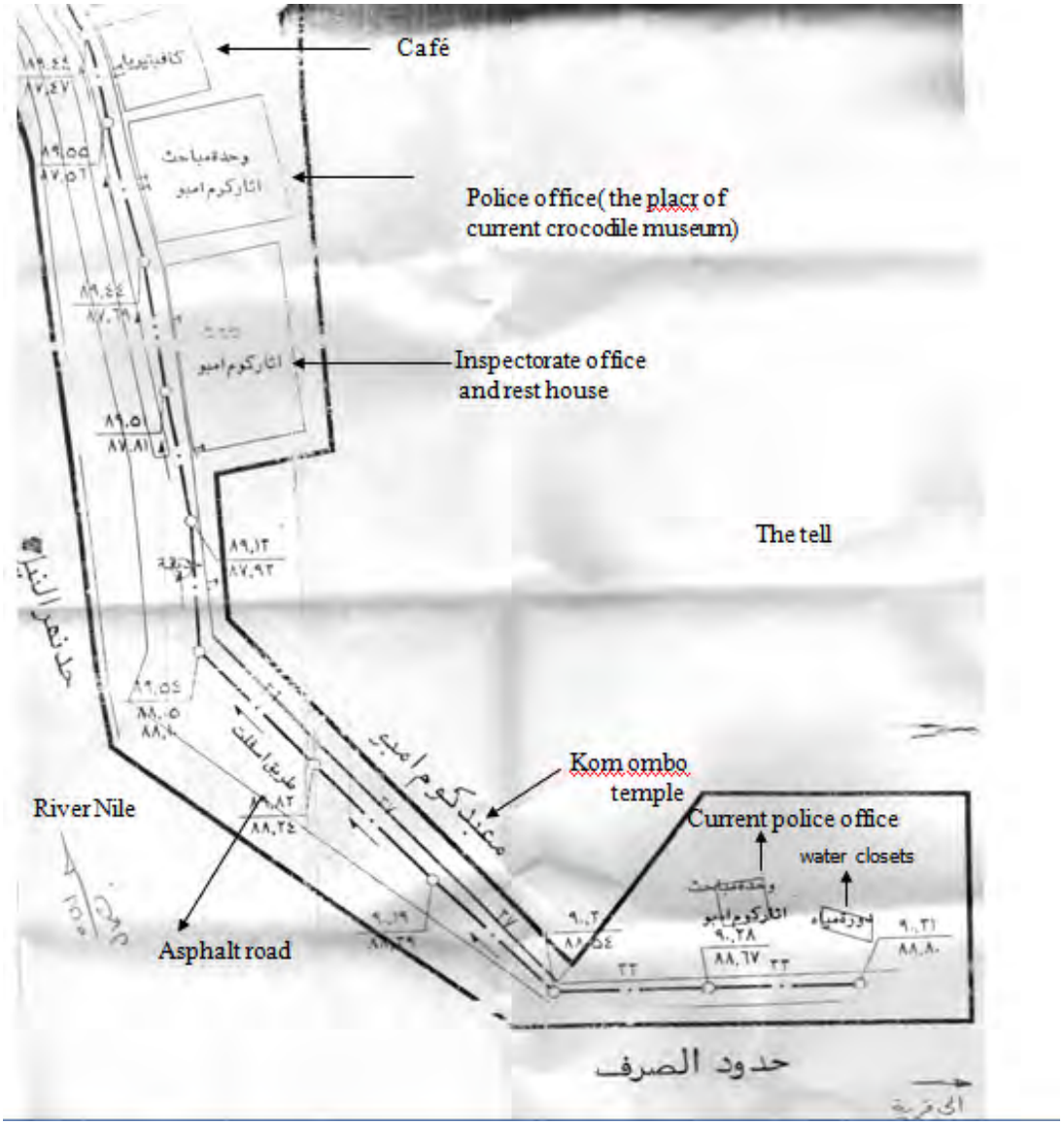


Figure 12. The locations of the café, police station and inspectorate office. The plan was originally drawn as a proposal for a sanitary drainage pipe project which was never implemented. The map was provided courtesy of the engineering department of the Contractor's Office.

Work conducted by the Supreme Council of Antiquities (SCA) between 1993 and 1998 was recorded as 'cleaning operations' in various parts of the temple and its surroundings. In October 1993 the SCA cleaned two areas; one was located inside the enclosure wall of the temple in the northern court where different types of objects were exposed. These pieces were placed beside the enclosure wall. The other area of cleaning was outside the southeast corner of enclosure wall of the temple.

Between 1 January 1995 and 30 June1996, the SCA cleaned behind the rear, northeast wall of the temple. Between 1 July 1996 and 31 March 1997 the SCA removed sand and cleaned in front of the Birth House on its northeast side, between the Sobek Chapel and Nilometer, and inside the subteranean chambers beneath the temple.

In 1998 the SCA cleaned the area between the mudbrick enclosure wall and the sandstone back wall of the temple beside the relief depicting surgical instruments (Kom Ombo Inspectorate Office 1998:1-2).

Between 17 December 2000 and 31 January 2001 the SCA excavated an area 45m by 65m located to the north of the temple in advance of construction of a magazine to house artifacts from the Kom Ombo area. The area was divided into 35 squares. During the work some twenty-two trenches were excavated. Excavations came to a halt for financial reasons (Kom Ombo Inspectorate Office 2000:1).

Between 5 April 2003 and 10 June 2003 the SCA excavated an area to the southeast of the tell and directly in front of the eastern gate ot the temple in advance of the creation of the present car park (Site 7 on Figure 11). The site measured approximately 61m E-W by 22.50m N-S at the eastern end and 15m N-S at the western end. The area was divided into trenches 8.5m x 7.5m (Kom Ombo Inspectorate Office 2003:1-2).

Between 6 April 2003 and14 June 2003 the SCA excavated two sites. An area designated Kom Ombo 1 (Site 5 on Figure 11) was located adjacent to the west of the modern northwestern enclosure wall. The area measured c. 30m by 30m and was divided into three 10m by 10m excavation squares. It included parts inside the temple divided into small squares 5m x 7.5 m 1A, 2A, 3A, A4,1B, 2B, 3B, 4B).

The second site, designated Kom Ombo 2 (Site 2 on Figure 11) was located about 170m to the north of Kom Ombo Site 1 and to the south of the storage magazine. This area measured about 20m by 15m (Kom Ombo Inspectorate Office 2003:1-2). Some test pits about 1.50m by 1.50m by 2m deep were excavated but again the work stopped for financial reasons.

Between 2002 and 2010 the site of Kom Ombo was affected by major and extensive re-development works, including the creation of a new museum, ticket office, new pathways, a terraced cruise ship docking area and construction of bazaars and cafes. Interviews with local SCA Inspectors who were present during this time provided us with the following information.[3]

- Access pathway: the old pathway was on the southeast side of the temple accessing the temple beside the southeast gate. The ticket office, a small wooden booth next to this, was a little way up some stairs. The new pathway is to the southwest, parallel with the Nile. The entry and exit are on the north over the ramp leading to the new museum.
- Stone walkway: this is built from sandstone and is 4m higher than the old road around the temple. It is about 450m long. This walkway replaced the old asphalt road, which passed in front of the temple, connecting the villages of el-Shutb and Bayaraa (Figures 13 and 14). The re-development program re-built the road using stone and restricted its use to serve only the archaeological area.
- Marina: creation of moorings for cruise boats.
- Ticket Kiosk: the location of the ticket kiosk was moved on three occasions prior to the 2002 – 2010 development program. Originally it was a mudbrick structure directly east of and under the Ptolemaic gate on the right of the old entrance. It was moved to the left of the entrance and later to the west of the toilets.
- The main entrance: this was originally located to the southwest of the temple, east of the Ptolemaic gate.

[3]Personal Communication 2015: Hossam el-Din Mostafa and Mohamed Ali, Kom Ombo MoA Inspectors.

- Bazaars: originally there were 33 stalls located directly on the western edge of the old asphalt road. These were transferred to the edge of the Nile, west of the temple on the lower terrace (see Figure 24). There are now 63 stalls.
- Crocodile Museum: the Inspectorate Office, Rest House, Police Office and Caffeteria (see 1986 excavations) had previously belonged to the Kom Ombo City local council. During the 2002-2010 re-development program, these were demolished with the exception of the Police Office. This building was evacuated by the police and modified to accommodate the new Crocodile Museum installed between 2003 and 2006.

In 2010 the National Research Institute of Astronomy and Geophysics (NRIAG) collaborated with the Supreme Council of Antiquities to conduct a comprehensive geophysical field survey of the Kom Ombo temple, the immediate surroundings, including the main entrance and the area of the Crocodile Museum, and part of the tell. NRIAG produced a report in 2010, which was translated into English by the Helal Group for Geotechnical – Geological – Geophysical Services, in 2015. Notes from this report are presented in Appendix 1.

Between 3 December 2012 and 3 January 2013 the MoA conducted excavations in a rectangular area located in the northwest sector of the tell, between the Crocodile Museum and the Fire Station to the north (Site 3 on Figure 11). The intention was to transfer the tourist bazaars from the dock area on the Nile to this area if possible. The excavation was named 'Tourist Bazaars' (EXTB). The area measured about 3m (E-W) X 80m (N-S) (Kom Ombo Inspectorate Office 2013:1-2).

Between 1 and 24 March 2015 twelve test pits were excavated as part of CDM Smith's geotechnical evaluation of the area prior to the forthcoming ground water lowering project (see Appendix 3). These test pits were excavated and recorded by the authors. The test pits were located within the

area bounded by the outer enclosure walls. The results of these excavations are reported in Appendix 2 of this report.[4]

Between 27 March and 23 April 2015 CDM Smith drilled eight boreholes (BHs 3, 7, 9, 10, 11, 12, 14, 15) and 22 piezometers (PZs 1, 2, 9, 4, 5, 7, 8, 9, 11, 12, 14, 15) as part of their geotechnical data collection (see Appendix 4). The boreholes were recorded by CDM Smith and by the authors. The results of these are reported in Appendix 3.

Between the 29 July and 3 August 2015 CDM Smith drilled a well (Well 1) to perform a pumping test, located outside the temple, between the Crocodile Museum and the entrance of the temple (Figure 6). The investigation was recorded by the authors and the results are reported in Appendix 4.

In early 2015 the main features of the temple and the area surrounding the temple were surveyed by CDM Smith's surveyor.

[4] The excavation archives are deposited with the American Research Centre in Egypt (ARCE), Cairo,

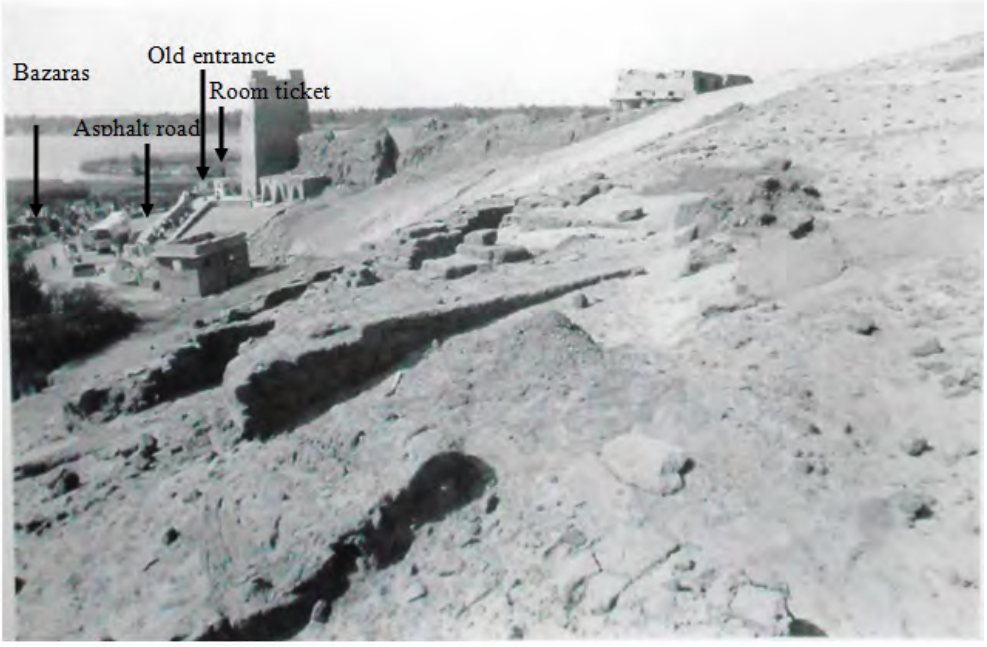


Figure 13. Showing some of the features existing in 1993 prior to the Development Project: (Wareth and Wagner 1993)

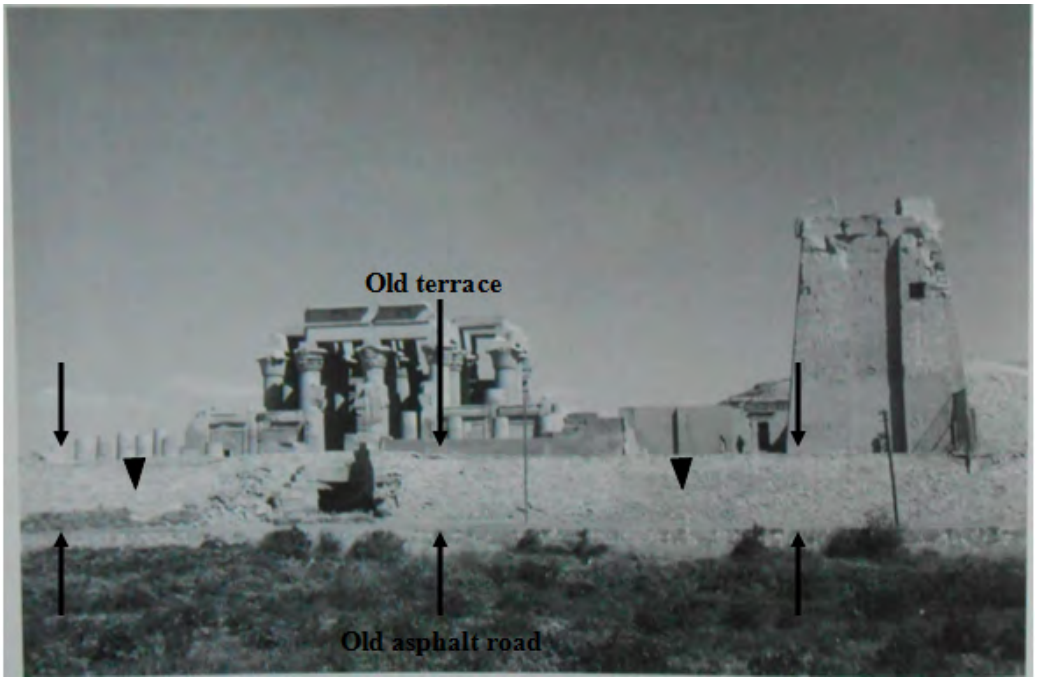


Figure 14. Showing the old asphalt road indicated by the upper arrows and the old terrace of the temple indicated by the lower arrows: (Morkot 2001:250)

6.3 Description of Heritage Assets by Zone

Below, the known heritage assets within the temple, tell and surrounding environs are described. To facilitate the accessibility of this information the descriptions are divided into spatial zones 1 through 9 (see Figure 15 for locations of these zones).

Zone 1

Zone 1 contains the Ptolemaic temple and the outer enclosure walls of the temple to the northwest, northeast and southeast, which may be a Roman period construction post-dating the building of the temple (Figure 16). The temple is built of sandstone quarried from Gebel El-Silsila. It comprises two conjoined temples, the northern part dedicated to the god Har-wer, 'Horus the Elder' and the southern dedicated to the crocodile god Sobek.

The temple was first mapped by the French surveyors and published in the Description de l'Égypte (Figure 53), but at that time only the upper surviving elements were visible above the contemporary ground level of the tell (Figure 17). Prior to the excavations by the Egyptian Antiquities Service from the 1890s onwards, the ground level reached mid-way up the columns of the first hypostyle hall and to the top of the easterly walls (Figures 17 and 18). This level is traceable today by the staining on the column shafts and walls.

A reconstruction plan was published in the Description de l'Égypte showing how the temple may have looked based on what was visible at the end of the eighteenth century together with the Birth House (also known as the Mamassi) and the enclosure wall (Figure 19). Since the forecourt (Zone 2) had not been exposed at this time, it is missing from the reconstruction. The Description de l'Égypte provides a description of the elements of the temple that could be seen and notes that both within and surrounding the enclosure mudbrick buildings formed a considerable elevation (Charbrol and Jomard 1809:1-10).

The Egyptian Antiquities Service cleared the settlement remains that covered the temple between 1893 and 1914. De Morgan (1895) produced a plan of the

architectural footprint of the temple (Figure 20) and a comprehensive epigraphic study of the various decorative elements as well as some architectural details.

The temple proper measures c. 71m NE-SW by c. 52m NW-SE, including the outer corridor, and is considerably reduced in many places. The temple consists of an inner and an outer wall creating a surrounding corridor (Figures 16 and 21). The northwestern outer and inner enclosure walls are considerably denuded, surviving only 0.90 m high in places (Figure 22). The western end is destroyed completely and only one course remains in the eastern part. A test pit was excavated as part of the 2015 geotechnical data collection (TP 8) against the external face of the outer enclosure wall. Here, the ARCE team recorded the base of the foundation of the temple wall at 81.76 m asl, founded on a layer of powdered burnt mudbrick. The southeastern outer wall is largely a modern rebuild in mudbrick dating to 1893 (Figure 25). This mudbrick wall was built on the remains of the sandstone temple wall. The stone masonry in this wall is clearly moist while the modern mud brick wall on top of it appears completely dry. Another test pit (TP 11) was excavated against the external face of the outer wall. Here, the ARCE team did not reveal the original temple wall. Rather, a modern stone foundation and the overlying modern mudbrick wall were recorded. On the southwest face of the northeastern outer enclosure wall there are the remains of an often-cited scene showing the king making an offering of a table with what have been interpreted as surgical instruments or possibly implements used during rituals (Figure 24).

The entrance into the temple proper is by two gates through the curtain wall (Figures 25 and 26) leading to the first hypostyle hall (Figure 27) the ceiling of which is decorated with astronomical scenes. The hall preserves the original paving stones with an average elevation of 96.70m asl. From here, the inner corridor is accessed and a double gateway leads into the inner second hypostyle hall (Figure 28), and then into a series of three vestibules or halls which are, in places, considerably reduced where the upper masonry courses have been removed in antiquity (Figures 29, 30 and 31). To the southeast of

the second vestibule a stairway would have accessed the roof which is now missing. Again, these areas have the original paving stones with an average elevation of 97.00m asl.

From the vestibules two sanctuaries are accessed, both still contain the black granite stone pedestals that would have supported the divine barques, of Har-wer and Sobek. The original paving in these two sanctuaries is at elevation 97.50m asl. Between the two sanctuaries there is a chamber reached by a tunnel that runs beneath the floor to one of the rooms behind. This passage may have accessed the now destroyed roof. A number of service rooms and cult chambers surround these spaces, as do a number of subterranean passages. These are of uncertain function but were possibly used to store valuable ritual objects. Within the northeastern chambers some floor slabs are slightly sunken, possibly indicating additional, unexcavated passages or subsidence in the underlying level. Test Pit 9 was excavated in one of the northern chambers, within a rectangular void in the sandstone paving blocks between the Har-wer sanctuary and the northern passage. At the base of the trench the team recorded irregular sandstone blocks at different levels that seem to step down to the northwest. Excavation stopped here. The trench contained just two deposits which continued to the west beneath the sandstone floor. The floor may be a modern construction above the sand. In this limited exposure it is unclear what the irregular sandstone blocks at the base represent; possibly an underground channel similar to others found in this area.

At the northeastern end of the inner corridor there are six small rooms, three on either side of a stairwell which leads to the roof (Figure 32). These rooms are currently inaccessible.

According to de Morgan, based on the location and dates of inscriptions, the temple was built in several phases. The sanctuaries, inner halls, and second hypostyle hall of the temple are the earliest elements constructed under Ptolemy VI and VIII (186–145 BC). The second hypostyle hall and inner enclosure wall were added later under Ptolemy XII (117 – 51 BC), and the

forecourt and outer enclosure wall added during the reign of the emperor Augustus (27 BC–AD 14). Arnold's reconstruction plan of the temple and associated elements shows this phasing (Figure 33).

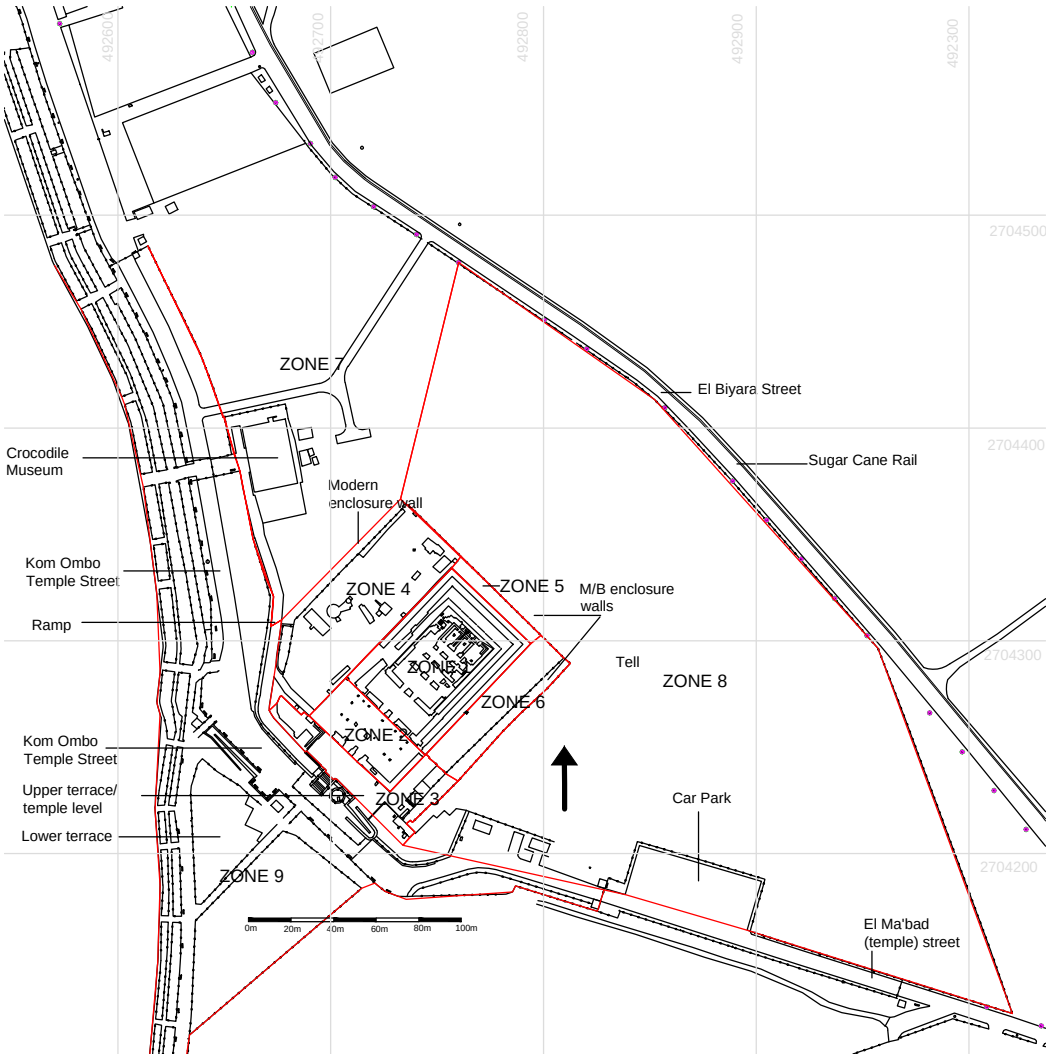


Figure 15. Locations of Zones. Map prepared using CDM Smith survey data

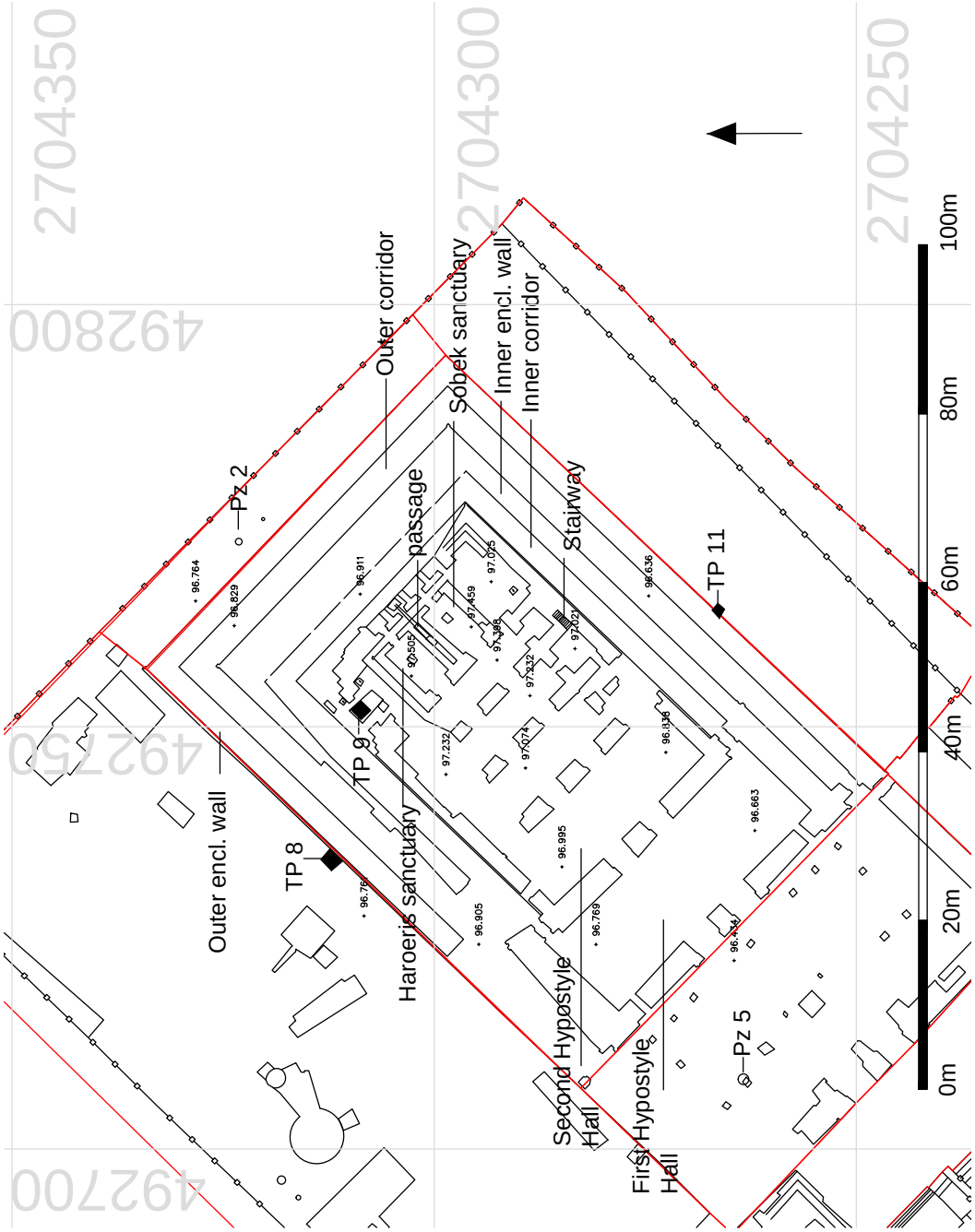


Figure 16. Plan of Zone 1 (the main temple) using the 2015 survey data

Figure 17. View of the Temple at the end of the eighteenth century. Description de l'Égypte 1820: Vol 1, Pl. 40)

Figure 18. Kom Ombo photographed in 1857 by Francis Frith; facing S/SE

Figure 19. View of the temple (1851-1852). N facing. Photo courtesy I. Migy

Figure 20. Reconstruction of the temple, mammisi and enclosure wall. (Description de l'Égypte 1820: Vol 1, Pl. 46)

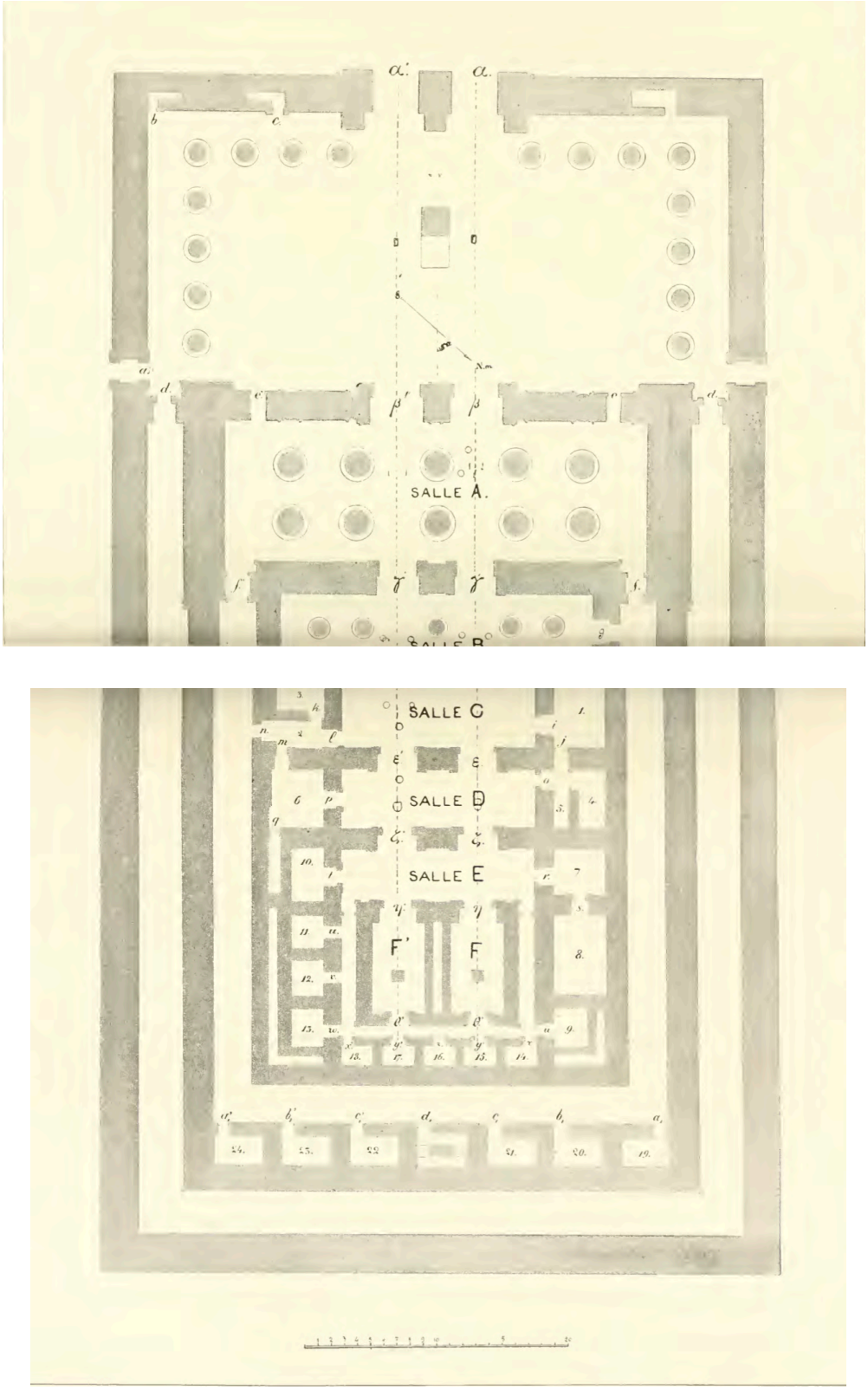


Figure 21. De Morgan's plan of the temple (de Morgan 1985)

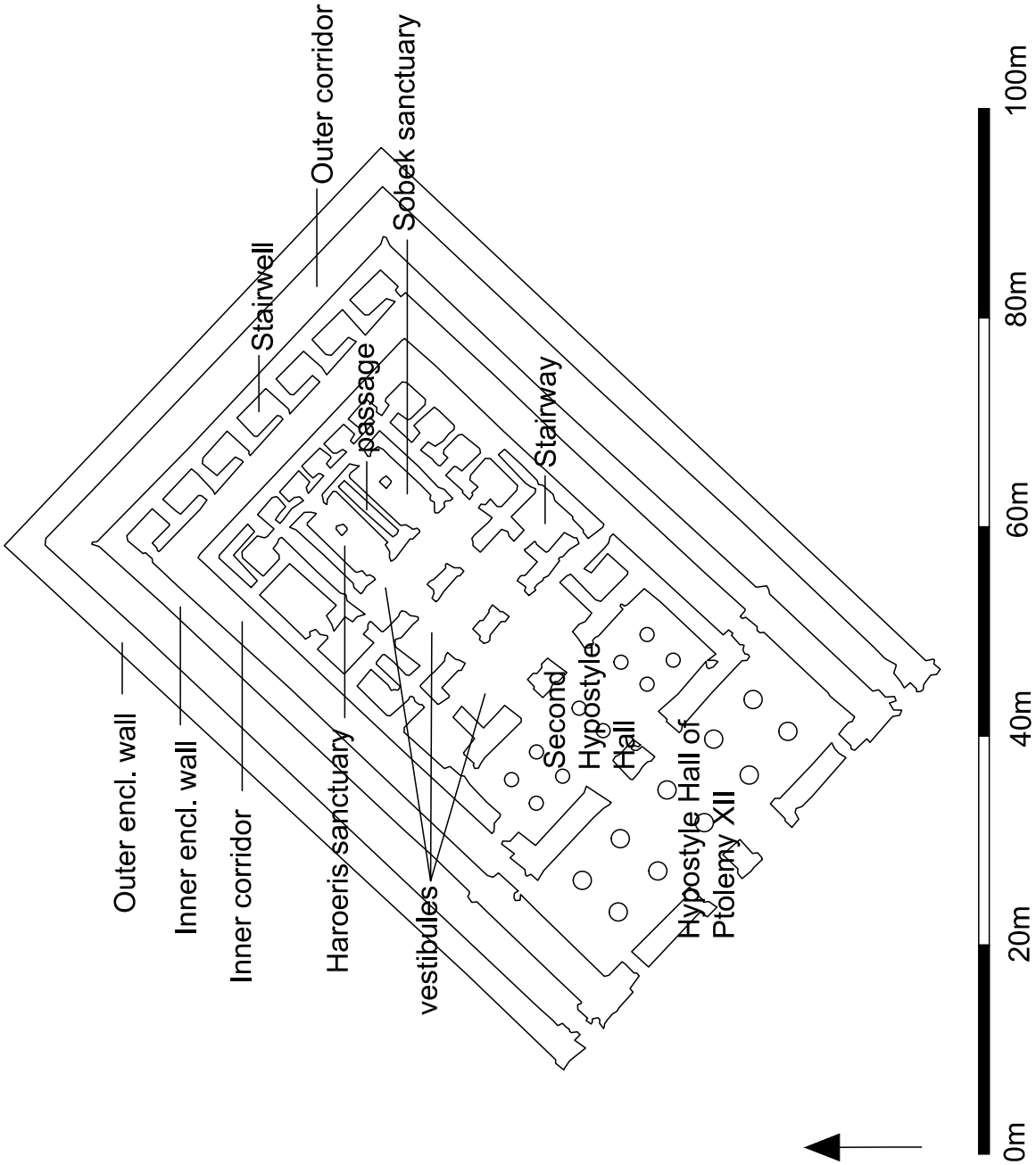


Figure 22. Digitized drawing of de Morgan's plan of the temple. Included here because there are elements drawn that do not appear on the plan produced using the 2015 survey data

Figure 23. Northwestern outer and inner enclosure walls showing the extent to which they are truncated. NW facing

Figure 24. The scene showing surgical instruments

Figure 25. Looking NE along the southeastern outer corridor. Note the SE enclosure wall of the temple has been rebuilt using stone and mudbrick

Figure 26. The curtain wall and double gates of Zone 1 with the forecourt (Zone 2) in front. NE facing

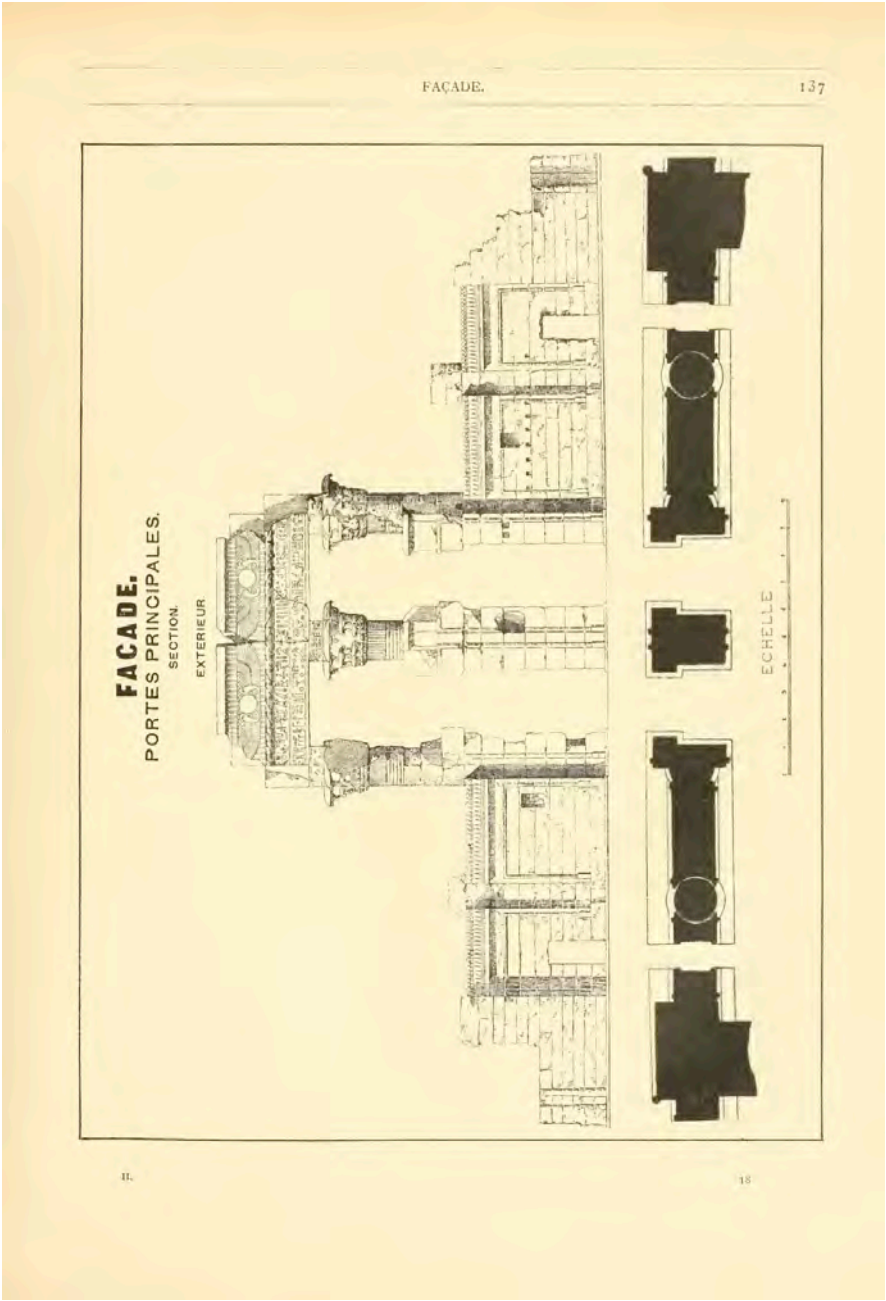


Figure 27. Elevation drawing of the exterior face of the façade (de Morgan 1985:137)

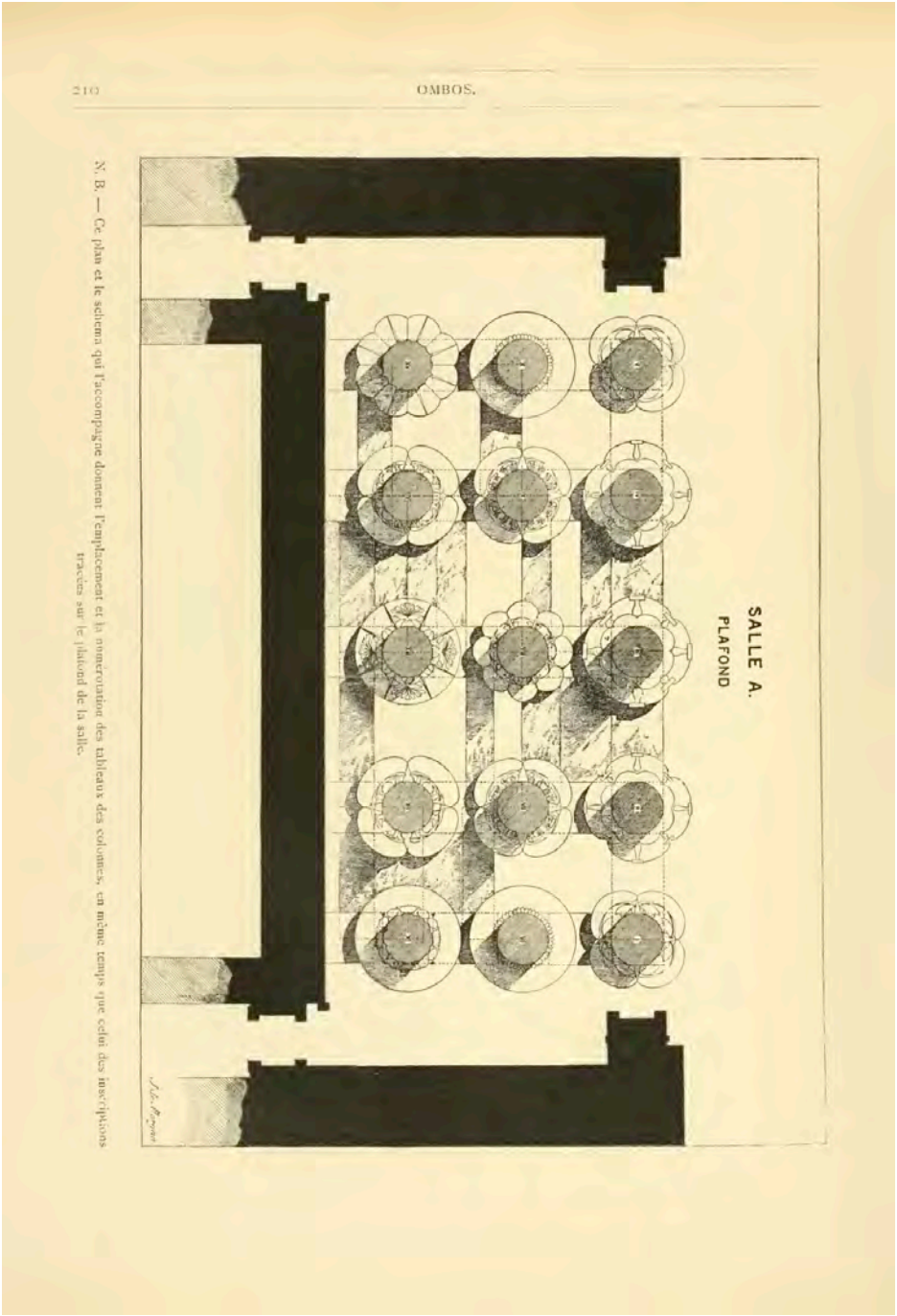


Figure 28. Plan of the first hypostyle hall (de Morgan 1985:210)

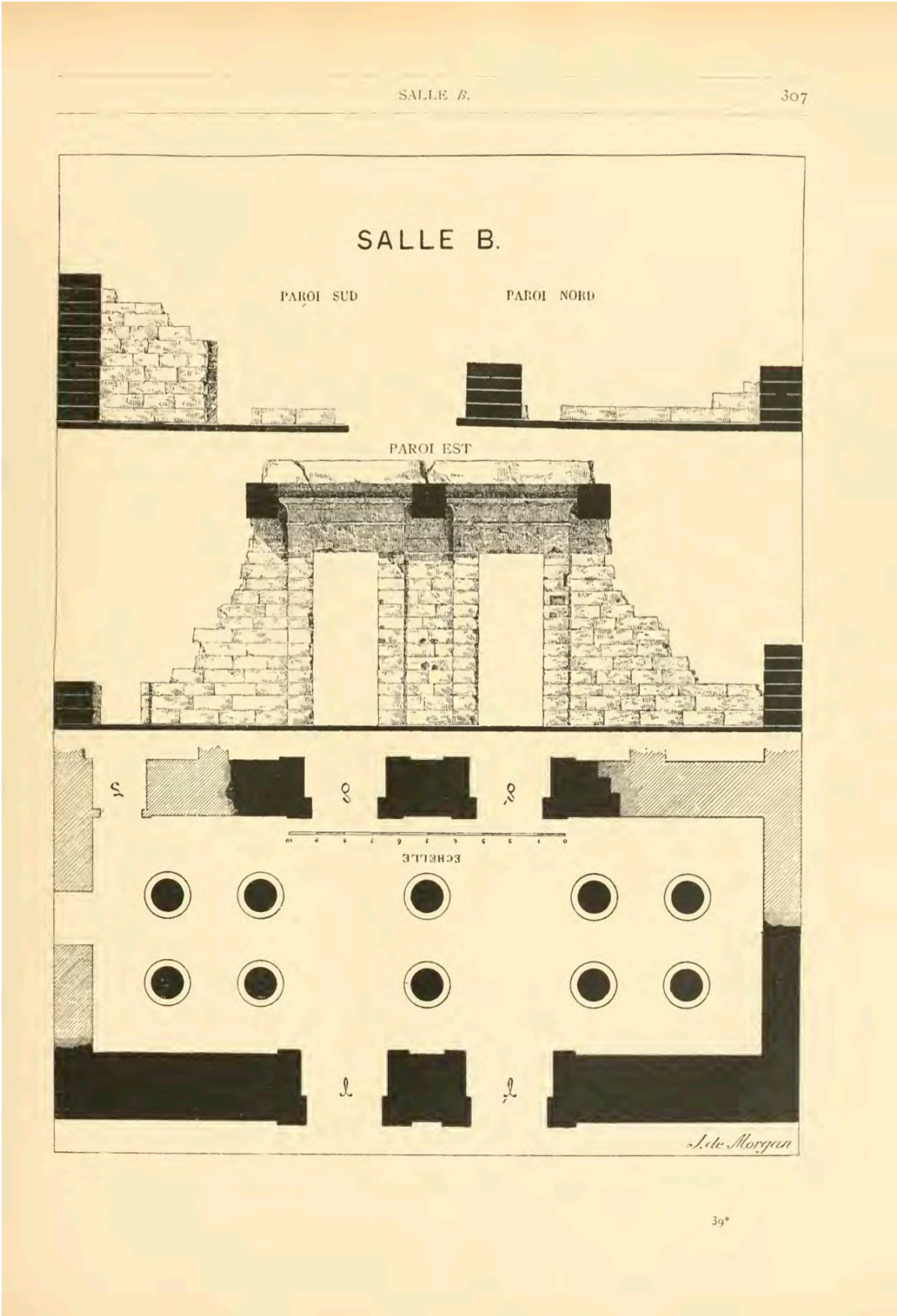


Figure 29. Plan and elevation of the second hypostyle hall (de Morgan 1985:210)

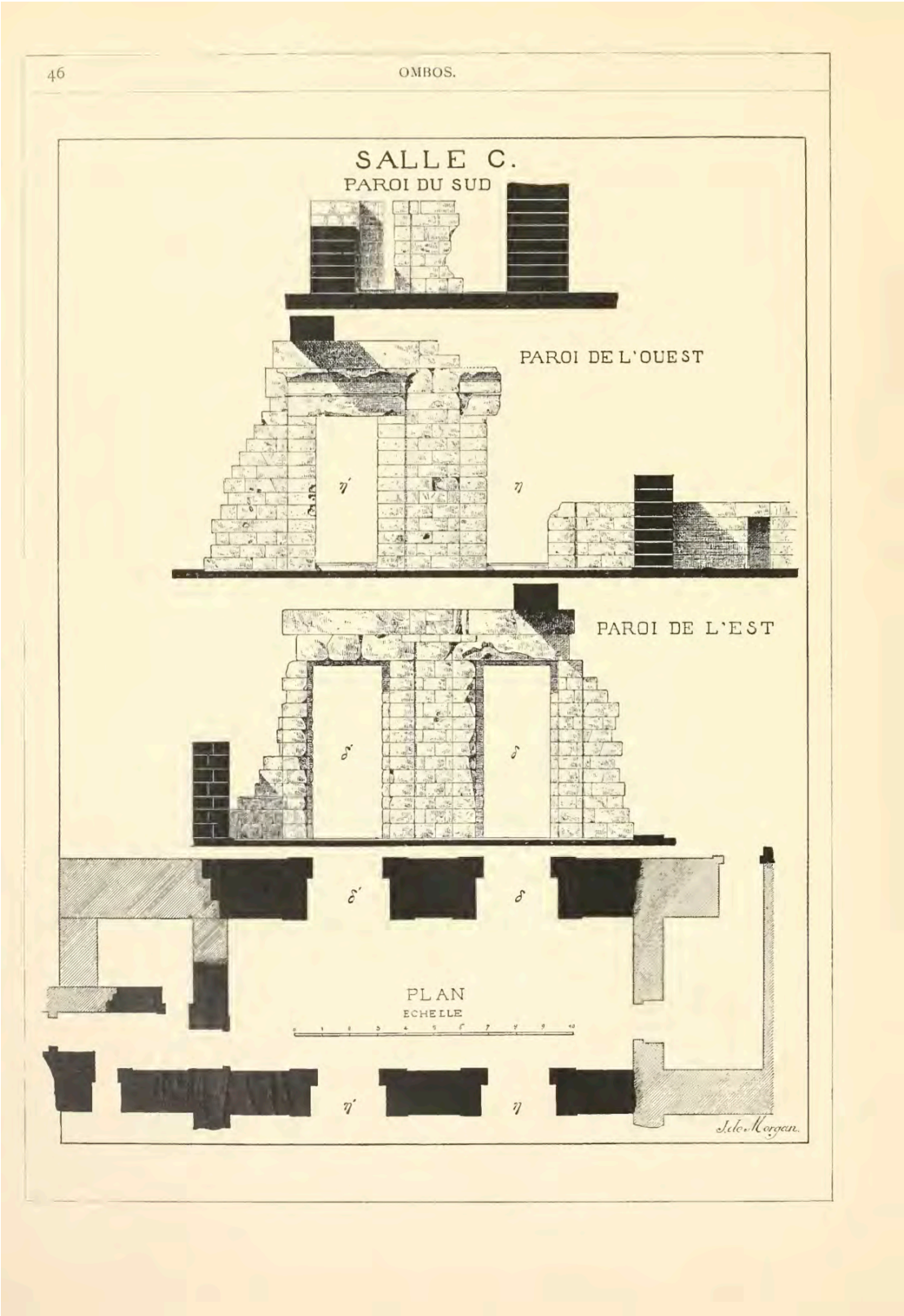


Figure 20. Plan and elevation of the inner halls (de Morgan 1902:46)

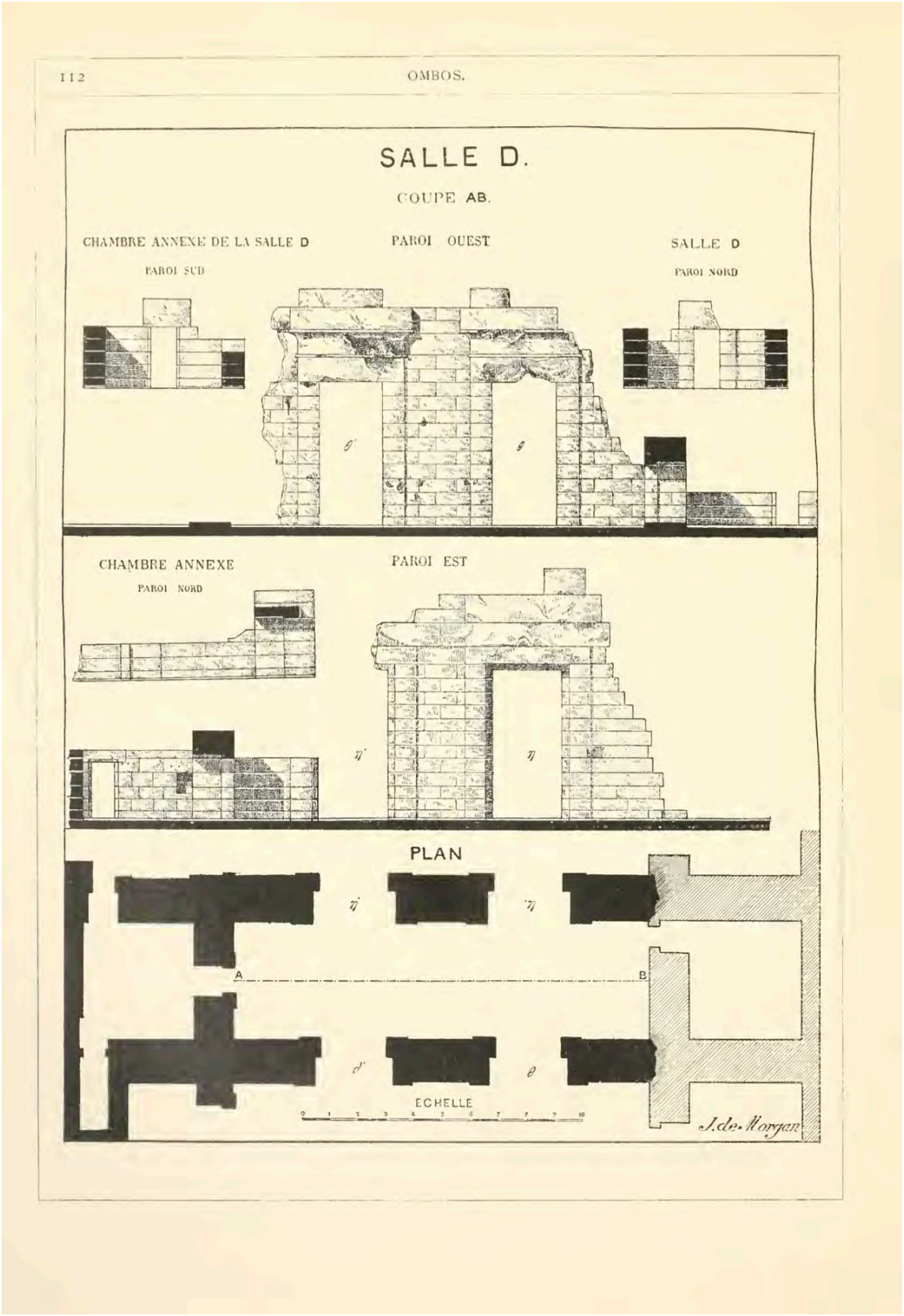


Figure 31. Plan and elevation of the inner halls (de Morgan 1902:112)

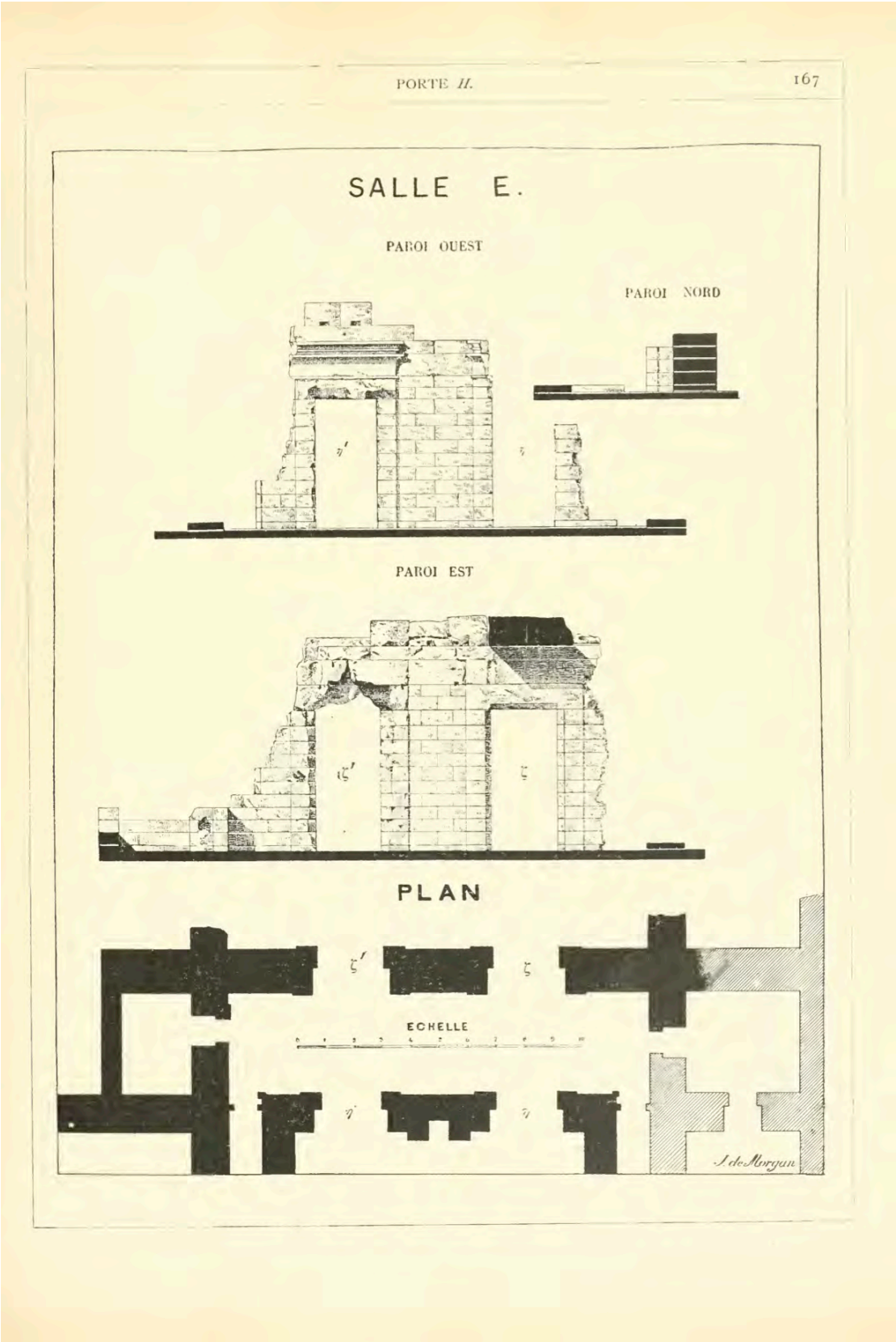
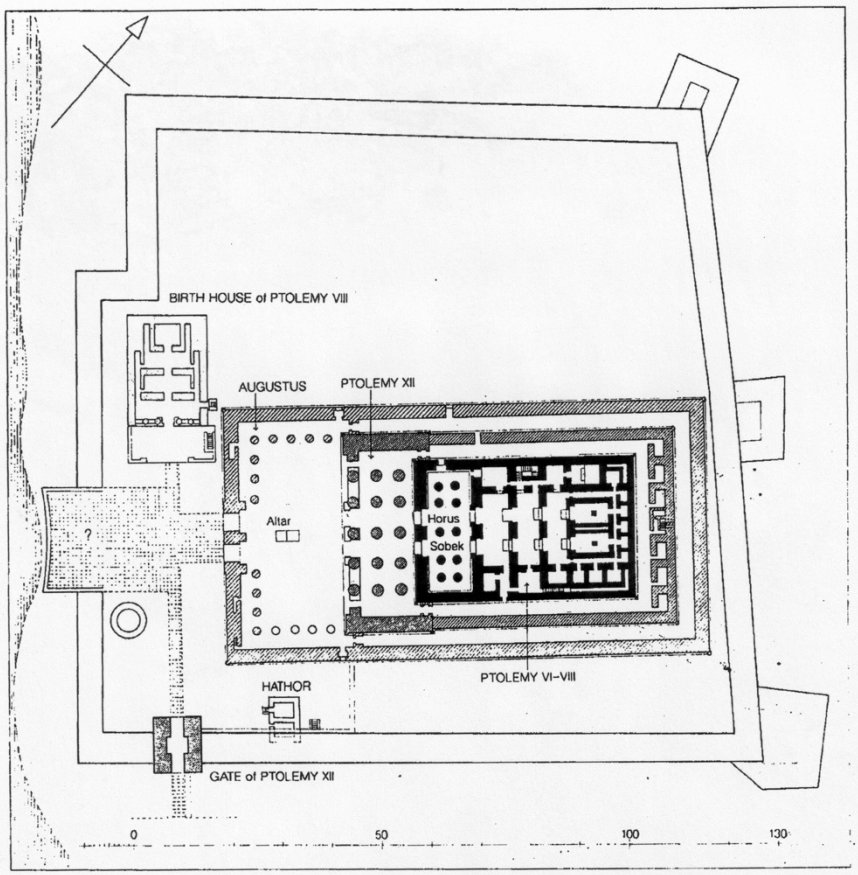


Figure 32. Plan and elevation of the inner halls (de Morgan 1905:167)

Figure 33. Rear area of the temple showing the currently inaccessible chambers (three doors visible center left). The pit in the center is TP 9



XIII. Plan of the temple precinct of Sobek and Haroeris of Kom Ombo.

Figure 34. Reconstruction plan of the temple precinct (Arnold 1999:figure XIII)

Zone 2

Zone 2 is located to the west of Zone 1 and encompasses the paved forecourt (Figures 35, 36), consisting of an extremely damaged pylon to the southwest, with two, mirrored accesses leading into a large court (52m NW-SE by 24m NE-SW), containing sixteen columns around the perimeter, and doorways through the open court to the northwest and another to the southeast. The paved floor within the forecourt is at c. 96.45m asl.

The northwestern wall and the northwestern portion of the pylon have not survived. The level in these areas is commensurate with the paving stones (Figure 37). The remains of some of the sandstone courses are displayed to the north of the entrance of the part of the temple dedicated to Hor-wer. Within the southeastern part of the pylon there is a small recess containing steps that would have led up to the top of the pylon.

The columns also survive to a maximum of about half of their original height, roughly 4m and have been heavily restored. The reliefs on these show depictions of the Roman emperor Tiberius (Figure 38). The sandstone paving stones within the court appear to be original and show extensive localized patches of moisture and in some areas they are slightly sunken (Figure 39). In the middle of the forecourt there is a small altar, not in situ. According to de Morgan, two small, angled cavities 15cm by 15cm were carved into the pavement, 0.75m apart and 1.50m in front of the pylon, (de Morgan 1985:76). De Morgan interpreted these as supports for a mobile staircase that would have accessed a structure (platform) 1m high by 6m long and 2m wide in the middle of the forecourt. He hypothesized that the shrine of a god/gods would have been placed here during certain ceremonies. De Morgan mentions that two stone altars were found during excavations and that these had probably been placed parallel with one another on the platform (de Morgan 1985:76). Presumably it is one of these that is currently displayed here.

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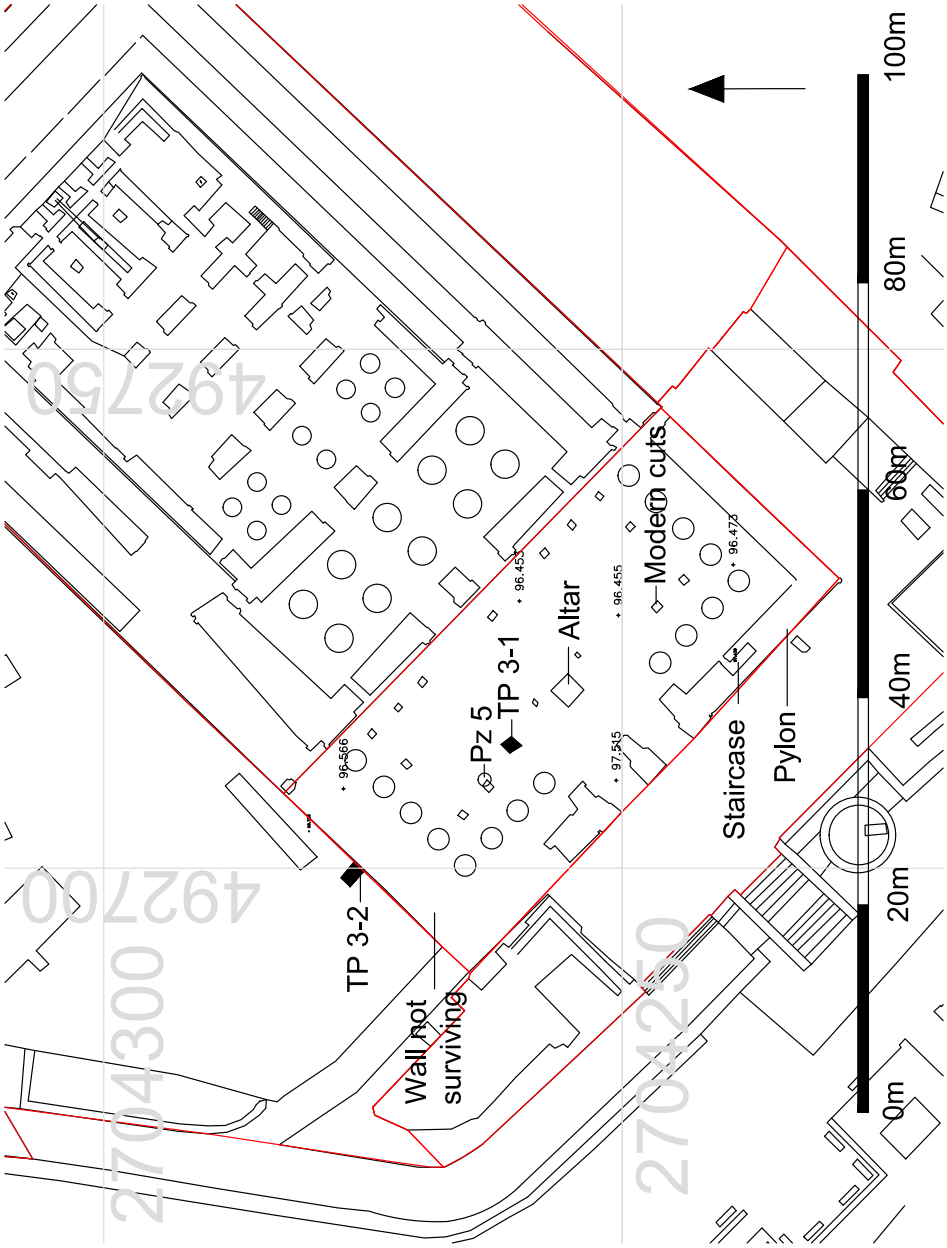


Figure 35. Plan of Zone 2 using the 2015 survey data.

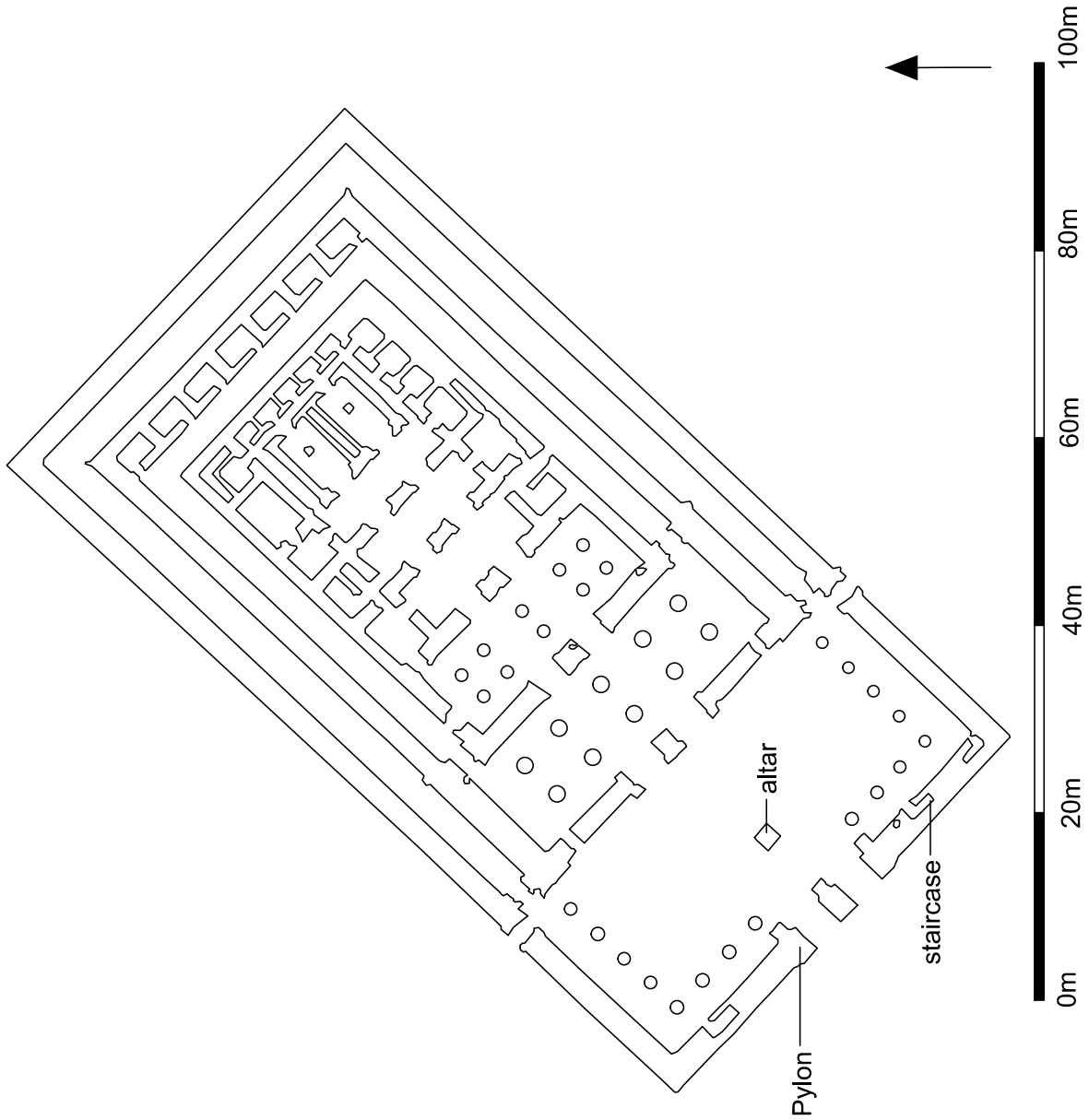


Figure 36. Plan of Zones 1 and 2, digitized from de Morgan (1895)

Figure 37. Zone 2 showing the absence of the northwestern wall of the forecourt. SE facing. 13 November 2014

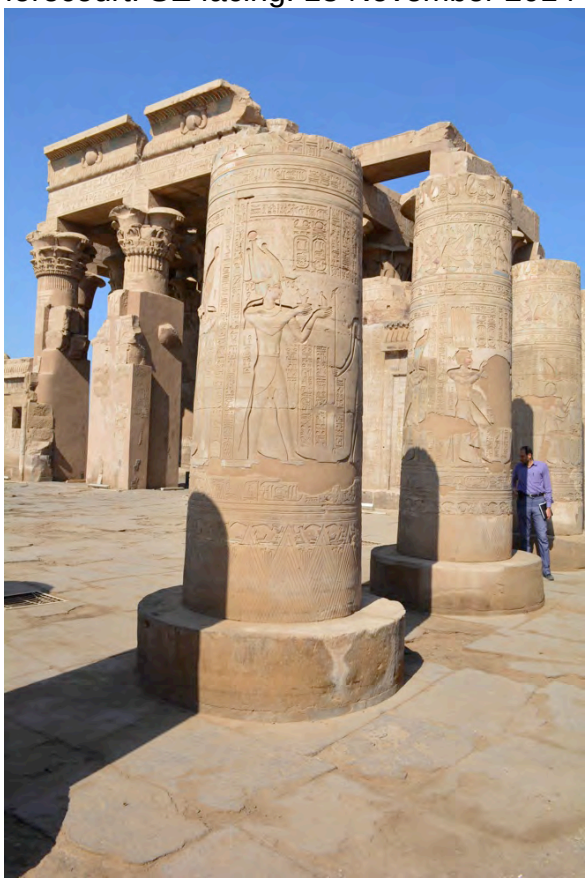


Figure 38. Photograph of columns in Zone 2, showing the Roman emperor Tiberius. 13 November 2014. NE facing

Figure 39. Paving stones in Zone 2; the forecourt. 13 November 2014. NW facing

De Morgan's publication provides a detailed study of the inscriptions in the court as well as elevation profiles of the architecture (see Figures 40 and 41). Based on the inscriptions within Zone 2, de Morgan interpreted the court as a Roman construction (de Morgan 1985:55) probably along with the outer enclosure wall of the temple proper (Zone 1). The reliefs in the court (Zone 2) show the earlier emperors Augustus and Tiberius (27 BC–AD 37). Reliefs on the rear part of the outer enclosure wall show much later emperors Marcus Aurelius, Commodus, Macrinus and his son Diadumenianus (AD 161–218) (de Morgan 1895:55).

During the geotechnical works associated with the ground water lowering project a test pit (TP 3-1) was excavated in an area where the paving stones were thought to be absent (see Appendix 2). However, after a few centimeters of excavation paving stones were revealed and excavation was halted (Figure 42). This excavation made clear that although on the surface the paving stones do not appear in good condition, it is only the upper parts of the stones

that have been damaged. Beneath this level, the stones are in good condition. A piezometer (Pz 5) was also drilled in the west corner of the forecourt (see appendix 3). Here, the pavement consisted of one sandstone block 0.64m thick. The sequence here showed that the pavement was founded on a 0.36m thick layer of reddish sandy silt (to 95.43m asl). Beneath this was a 5m thick deposit of black burned bricks between 90.43m asl and 95.43m asl (Figure 43), and beneath this there was a 12m thick deposit of silty clay with pottery sherds (between 78.43m asl and 90.43m asl; Figure 44). Beneath this there was a deposit of silty sand down to at least 76.43m asl, where drilling stopped.

Test Pit 3-2 was excavated against the outer face of the northwestern wall of the forecourt. The base of the forecourt wall was recorded at 94.51 asl (Figure 45). There appeared to be one foundation course built in a construction trench overlain by stepped courses of foundation stones. The base of the foundation therefore was only 0.92m lower than the upper limits of the black burnt brick deposit in Pz 5. This may indicate that the bulk of the material found in Pz 5 (the 12m thick silty clay with pottery sherds, and the 5m thick deposit of burned brick) represents settlement remains pre-dating the construction of the Roman forecourt rather than make-up to build the forecourt. It is clear that within this area there are substantial archaeological deposits down to 18 m below the current ground level.

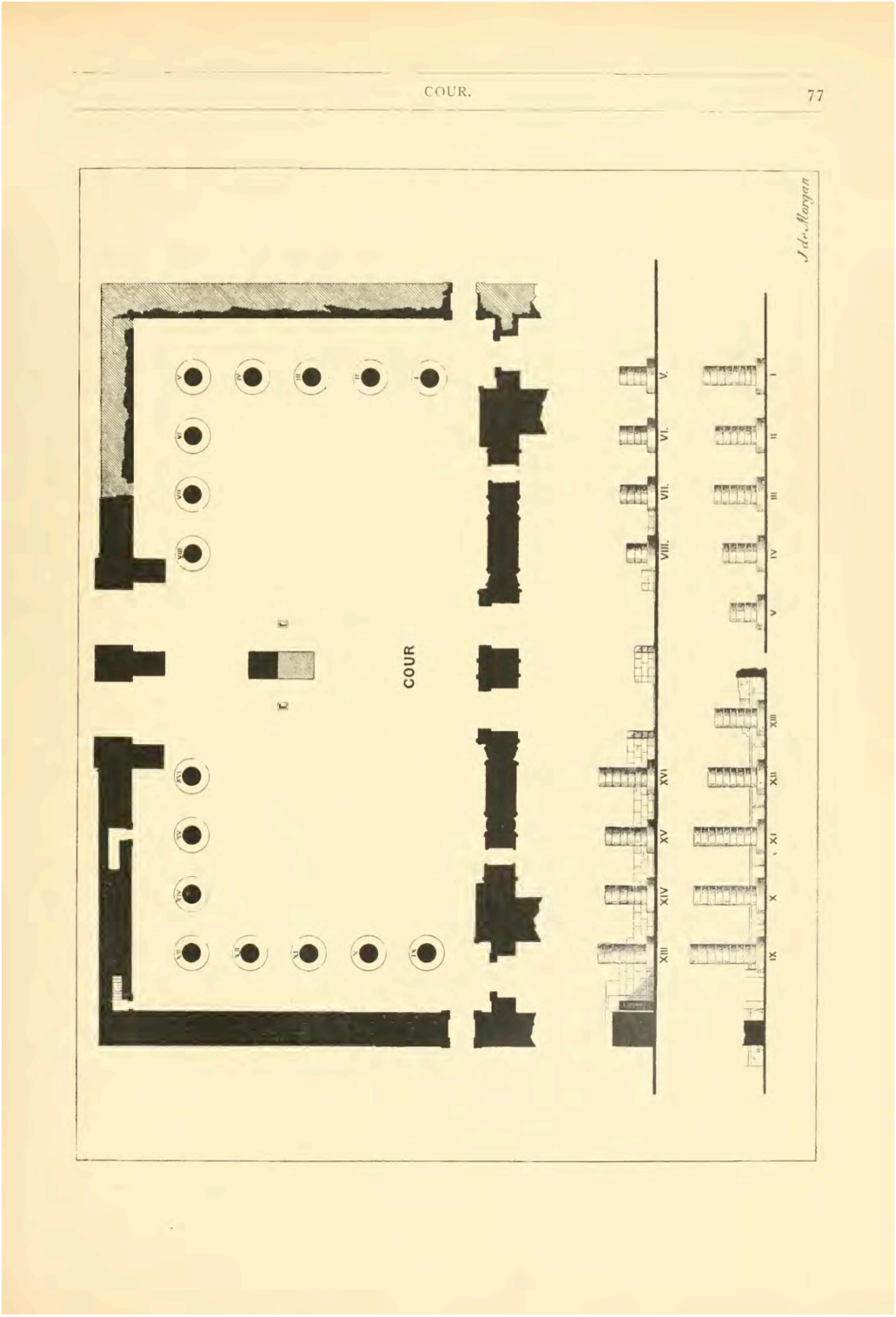


Figure 40. Plan and profile of Zone 2 (de Morgan 1985: 77)

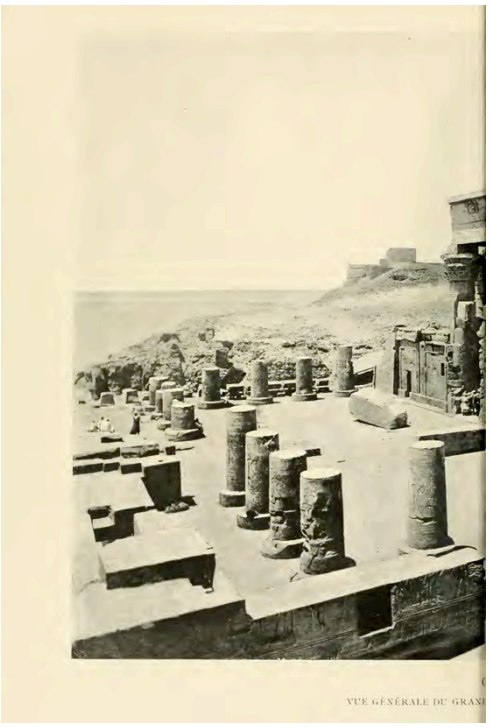


Figure 41. Zone 2 after clearance in the 1890s; (after de Morgan 1895:frontispiece)

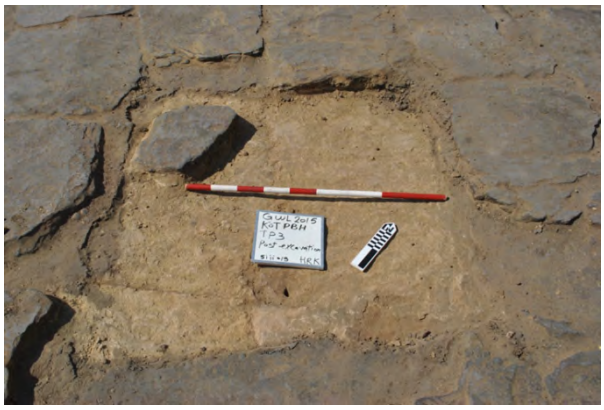


Figure 42. The original sandstone floor [118] in Test Pit 3-1

Figure 43. The original sandstone floor [118] in Test Pit 3-1

Figure 44. The deposit of mudbricks in Pz 5

Figure 45. The deposit of sandy clay with pottery sherds in Pz 5.

Zone 3

Zone 3 is located to the west of the temple. The area is paved at a level commensurate with the level of the paving in the forecourt (Zone 2). This zone contains the following visible features: the Birth House (also referred to as the Mammisi), the Hathor Chapel and the South Gate (Figures 46 and 47). The northern part of the paving is original but the paving from the entrance into the temple to the south of the south gate is modern. The development program of 2002-2010 developed Zone 3, along with the rest of the temple, into an upper terrace by encasing the southwest and southeast sides with stone (Figures 48 and 49). Along the southeastern limits, this paving covers ancient mudbrick structures (see description of Test Pit 12 below).

Zone 3 has been severely damaged by inundation floods, removing what would have been the southwestern stretch of the enclosure wall of the temple precinct, much of the birth house, and half of the south gate. Historic photographs taken of the temple show the levels to which the inundation waters reached (Figures 50, 51, 52), showing the eastern half of the south gate pedestalled and the stones of the birth house tumbling down the bank into the Nile. According to the Description de l'Égypte, more of Zone 3 was present at the end of the 18th century (Figure 53), than appears in the mid to late 19th century photographs, paintings and plans. For example, part of the southwestern enclosure wall seems to have been still present and part of the western half of the south gate. Using this information, Arnold published a plan of what the architectural footprint of this area of the temple may have looked like (Figure 54), showing a dog-legged enclosure wall, built around the Birth House (Arnold 1999).

The South Gate is an imposing sandstone structure, abutted to the northeast by the equally imposing mudbrick outer enclosure wall. The South Gate appears first in the Description de l'Égypte, where it is described as tumbling down the slope of the banks of the Nile along with the enclosure wall. (Charbrol and Jomard 1809:1-10).

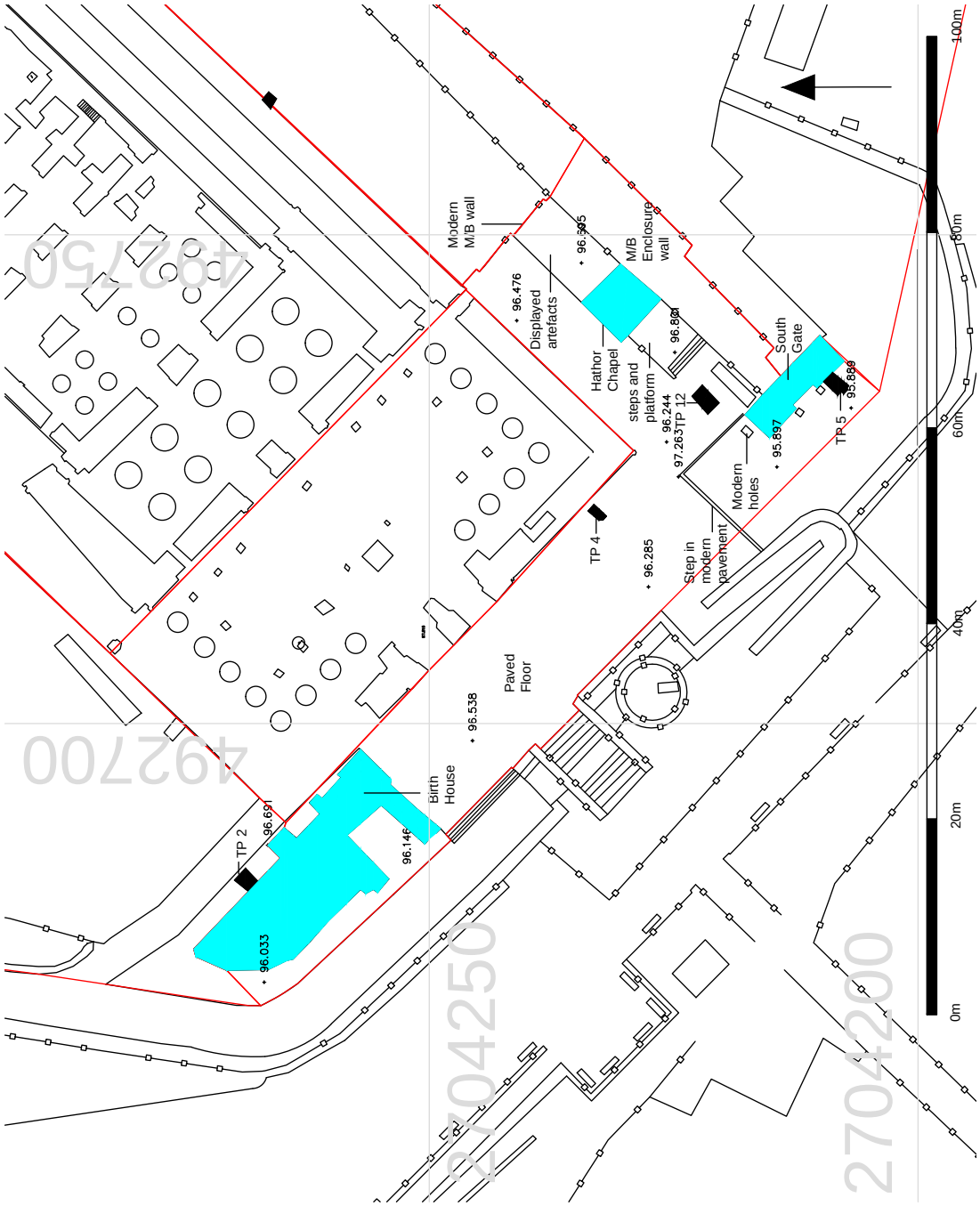


Figure 46. Plan of Zone 3, using 2015 survey data

Figure 47. Plan of Zone 3 using de Morgan's plan (de Morgan 1895) with walls built by de Morgan highlighted

Figure 48. View of Zone 3 showing how it has been made into an ‘upper terrace’ paved and encased with modern paving, West facing

Figure 49. View of Zone 3 from lower Zone 9 showing terracing. The ‘upper terrace’, Zone 3, is accessed by stairs and disabled ramp from Zone 9

Figure 50. Kom Ombo photographed from the north in 1857 by Francis Frith; http://collections.vam.ac.uk accessed 1 Oct. 2014. NB. 1836 is not the date of the photograph.

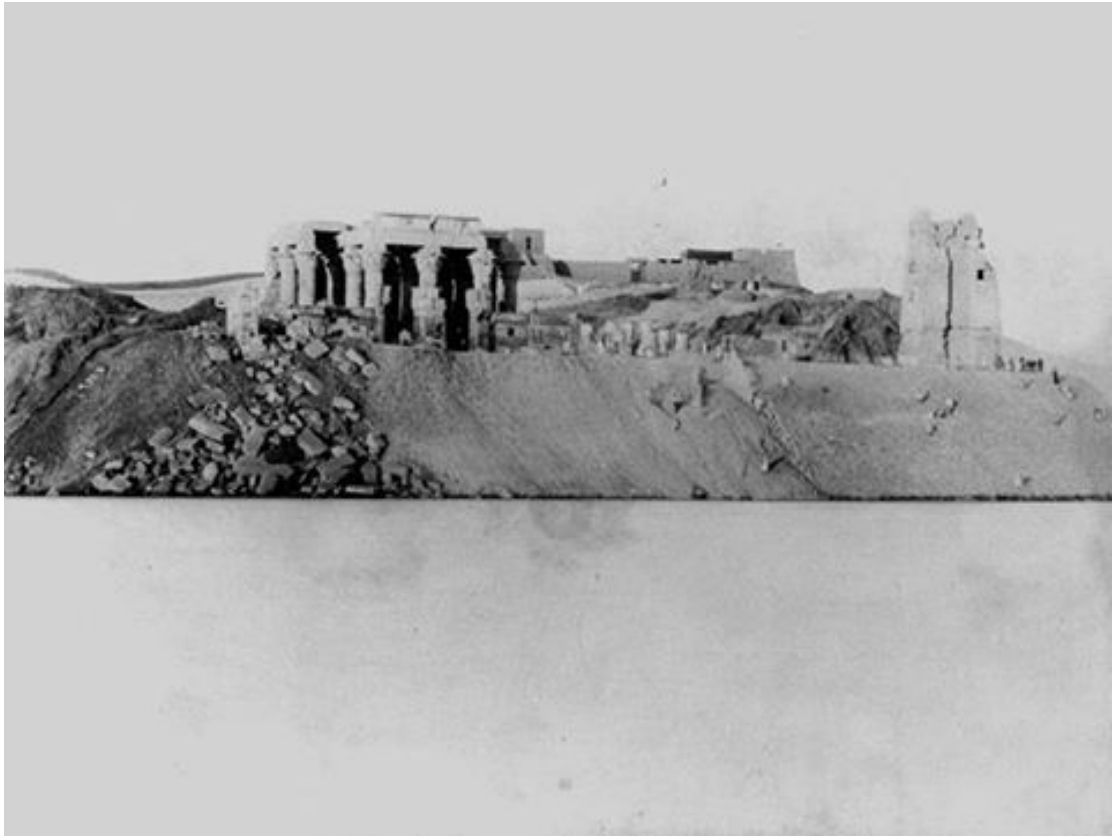


Figure 51. Kom Ombo, photographed from the southwest c.1895-1900. On the left, the blocks of the Birth House can clearly be seen tumbling down the riverbank. Photo provided by Hussein Rekaby.

Figure 52. Werner 1874. Carl Werner's Nile Sketches; the temple ruins of Kom Ombo. Lithograph; http://collections.vam.ac.uk

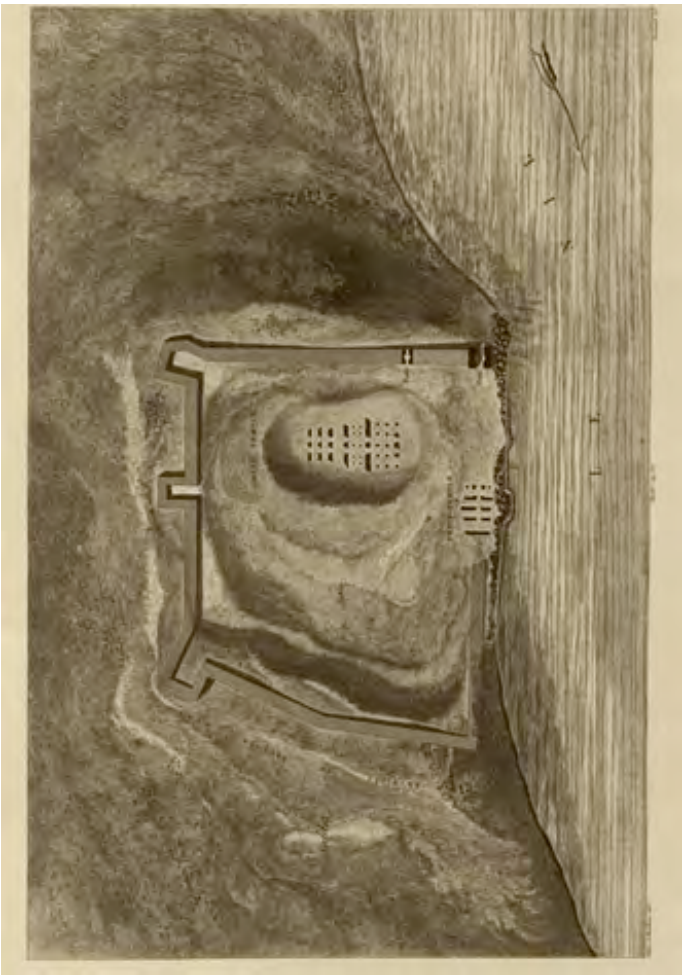
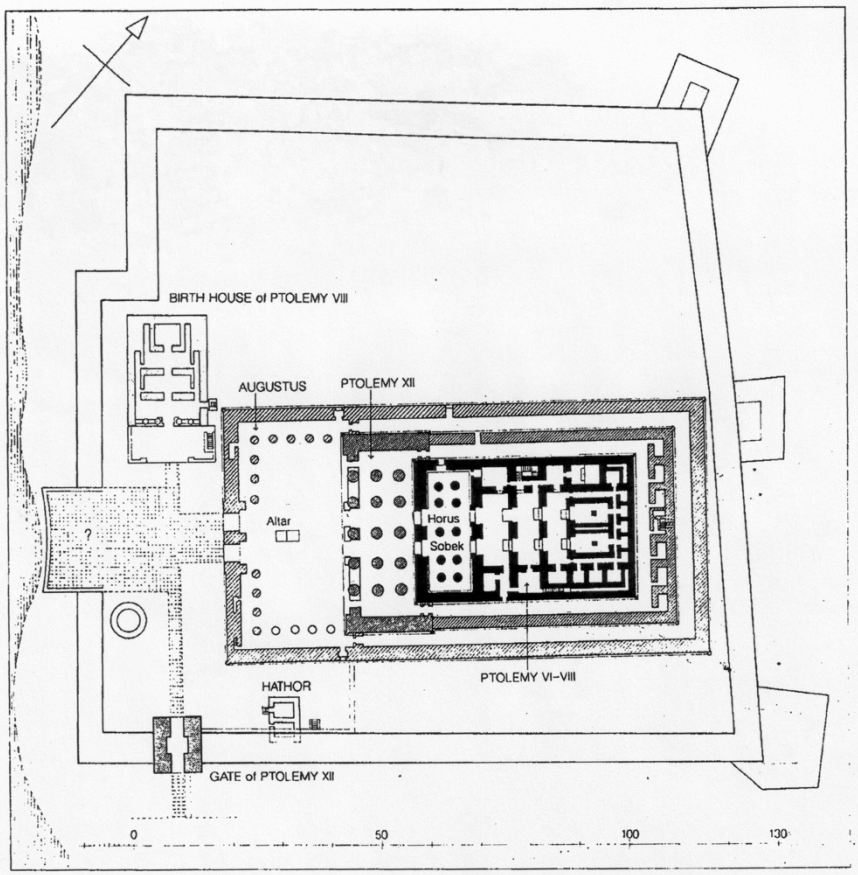


Figure 53. Plan of the ruins and environs (Description de l'Égypte 1820: Vol 1, pl. 39)



XIII. Plan of the temple precinct of Sobek and Haroeris of Kom Ombo.

Figure 54. Reconstruction plan of the temple precinct (Arnold 1999:figure XIII)

The South Gate was first studied by de Morgan (de Morgan 1895). Based on inscriptions, the gate has been dated to the reign of Ptolemy XII (117–51 BC). De Morgan's elevation drawing shows 5m of foundation courses and indicates that the foundations go down further (Figure 55). It is unclear whether this was actually seen or assumed.

As part of the 2015 geotechnical evaluations, a test pit (TP 5) was excavated against the west face of the south gate measuring 1.35m (E-W) by 2.2m (N-S) by 2.60 m deep. There was no evidence of an original floor in front of the gate. The test pit reached the base of the gate at 2.60m below the modern

floor level (at 93.39m asl). The gate appears to have been 'trench built' (meaning built within a foundation trench, built flush up against the side(s) of the foundation trench), cutting through and founded upon a deposit containing burnt mudbricks, a deposit that was at least 1.71m thick. Above this deposit, and therefore laid after the gate had been constructed, was an ashy silt mixed with burnt mudbricks. Above this, at 0.47m below ground level, at 92.92m asl, there was modern concrete. According to Barsanti's account of works in 1915 the southern face of the gate had become extremely unstable. To stabilize it he excavated to the foundation which he records as 5m below ground level on the south side and filled the area with stone and concrete (Barsanti 1915:166). The concrete encountered presumably belongs to this stabilization work.

Along the northwestern face of the outer mudbrick enclosure wall, a modern mudbrick wall was constructed by de Morgan, presumably to add extra support, to prevent the enclosure wall and surrounding tell from falling into Zone 3 (Figure 47 and Figure 56). This modern wall returns to the northwest, holding back the unexcavated tell in Zone 6. Within this area, between the Gate and the NW-SE modern wall, there is a small rectangular chapel for the goddess Hathor, commissioned by the Emperor Domitian (AD 81-96) (Figure 56). The chapel was built at a higher level than the surrounding floor and can be accessed by steps. It was used as a museum until recently, housing a selection of mummified crocodiles excavated from El-Shutb village (see below) until the creation of the Crocodile Museum when the mummies were moved and the chapel closed to visitors. In the area to the northeast of this there is a fenced off rectangular area where a selection of sarcophagi and statues are currently displayed (Figure 57).

During the 2015 geotechnical works, a test pit was excavated between the Hathor Chapel and the South Gate (TP 12), measuring c. 2.00m E-W by 2.00m N-S by 2.50m deep. Here we found that the leveling for the modern pavement was 0.40m deep. Beneath this a NW-SE mudbrick wall [168] was encountered founded at 95.81m asl (figure 58). Beneath this, two deposits were recorded which together were 2.16m. The upper was a layer of silty

sand with unburnt bricks; the lower was a 1.06m thick deposit of fine sand. Beneath this we exposed a mudbrick wall, with a foundation level of 93.68m asl (2.54m below ground level), preserved 0.60m high, orientated NE-SW (Figure 59) (see Appendix 2 for plans, photographs, section drawings and detailed description).

A little to the northwest of TP 12, Test Pit 4 was excavated. Here, at 0.40m below ground level the original sandstone floor was encountered at 95.93m asl, at which point excavation was stopped. The original pavement here therefore, is more than 2m above the foundation of the lower mudbrick wall in Test Pit 12.

The Birth House (Mammisi) has been severely damaged as noted above; its southwestern side has been completely destroyed. The temple is built of sandstone and was constructed in two phases during the two parts of the reign of Ptolemy VIII Evergetes II (170–163 BC and 143– 116 BC); Bianchi 2005:504). The Birth House was the venue for a festival celebrating the birth of the gods. The building measures 18m by 23m. The plan followed that of an ordinary temple 'with a room for visiting gods, an offering hall, and a sanctuary that was laterally isolated' (Arnold 1999:202). The temple appears in the Description de l'Égypte shown with four columns, six walls and three gates. The exterior walls had already been completely demolished by the river. Little more than four columns, six sections of walls and three gates survive today. The exterior walls are almost completely lost. De Morgan records a narrow bay opening to a landing (from the courtyard) leading to 14 steps down to a second level. From here there is a second staircase of 3 steps leading to a tunnel opening above the river.

As part of the 2015 geotechnical work a test pit (TP 2) was excavated against the northeast face of the Birth House wall. Here we identified the base of the eastern Birth House wall at 94.93m asl. The wall had been built within a NW-SE foundation trench that was found to cut an earlier mud brick wall (see description of Zone 4).

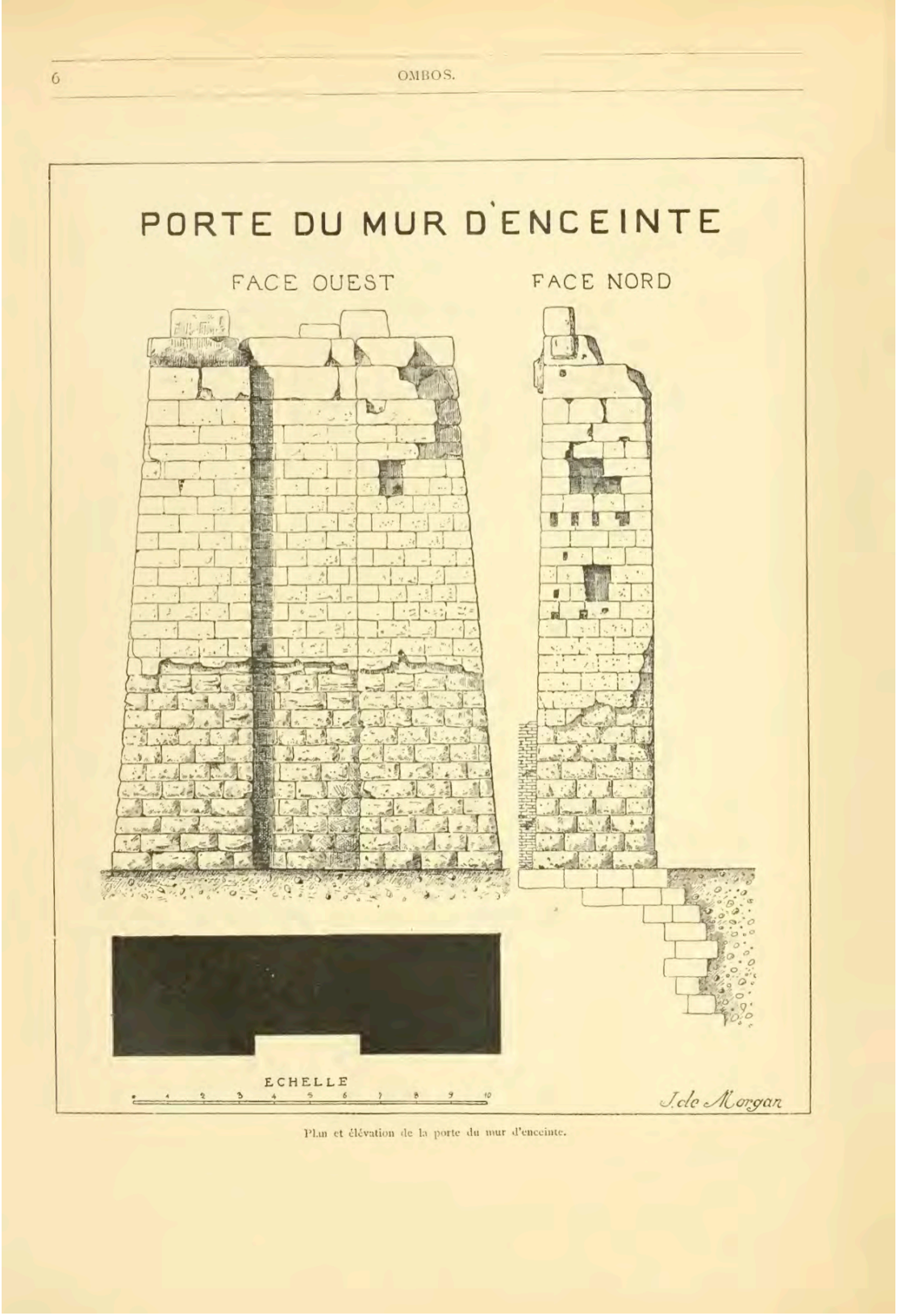


Figure 55. The South Gate. De Morgan 1895: 6

Figure 56. South Gate showing the modern mudbrick wall built inside the ancient enclosure wall behind, and the Chapel of Hathor. SE facing

Figure 57. The two modern mudbrick walls holding back the tell and enclosure wall with the cordoned off display area in NE corner. SE facing

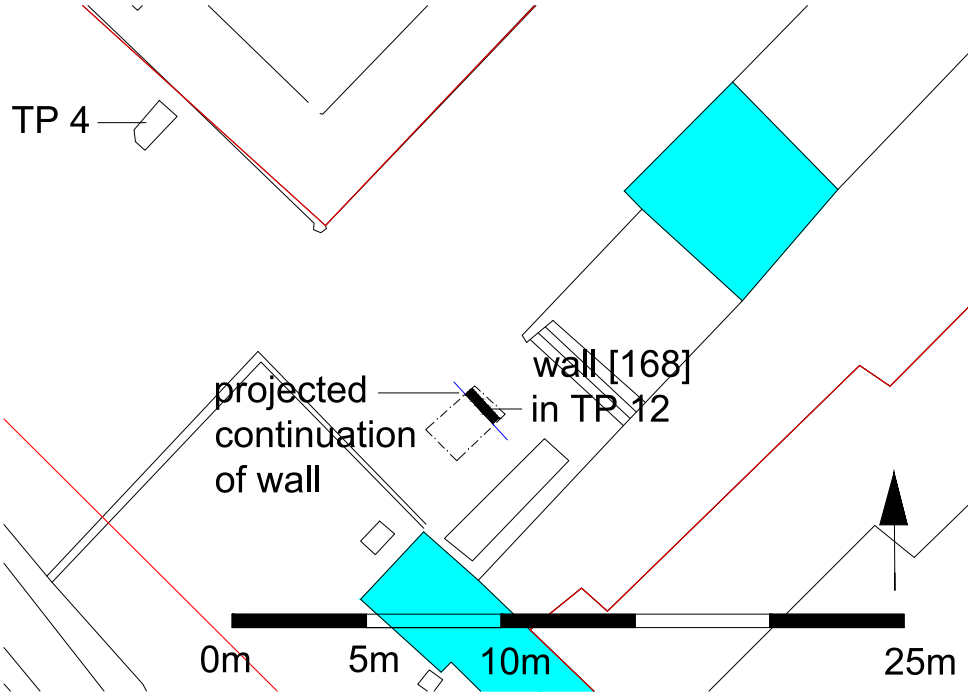


Figure 58. Plan showing location of wall [168] recorded in Test Pit 12

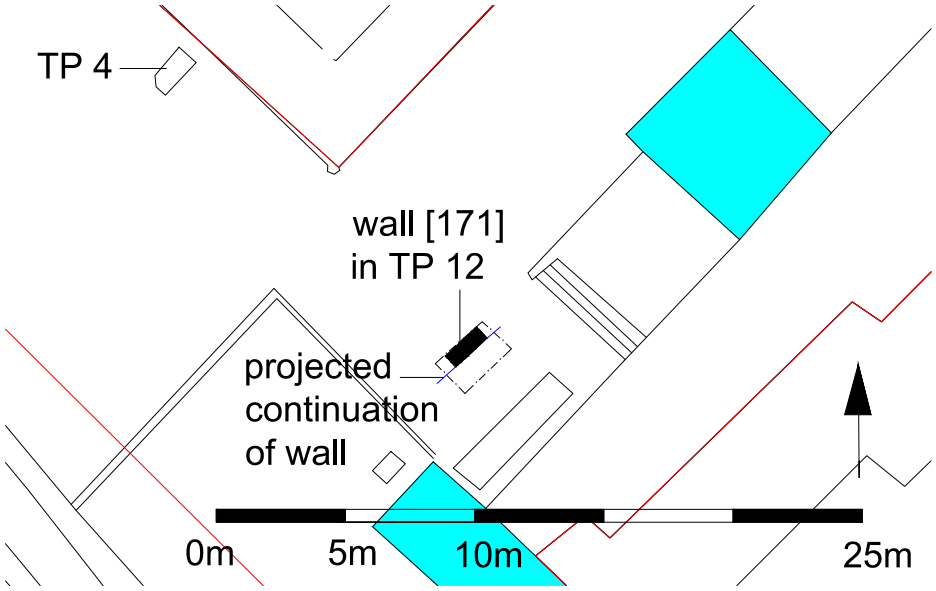


Figure 59. Plan showing location of wall [171] recorded in TP 12.

Zone 4

Zone 4 is large area located to the northwest of the temple also referred to as the Open Court or the Northern Court (Figure 60). The area is bounded to the northeast by the outer mudbrick enclosure wall and modern mudbrick support, and to the northwest by a low, modern mudbrick wall. According to de Morgan's 1895 plan (1895:frontispiece; figure 9) and Howard Carter's 1903 plan (Carter 1903: fig 1) the original northwestern enclosure wall is 16m further to the northwest than the existing modern wall (Figures 61 and 62). That said, however, caution is needed when overlaying the boundaries of de Morgan's enclosure wall with other plans. As was highlighted by Kemp, de Morgan's plan shows the northeastern outer enclosure wall as running at a marked angle from the orientation of the temple wall. Since there is neither evidence for this on site nor in photographs taken by Carter in 1906 (Carter 1903, fig 1), Kemp concluded that the enclosure wall was added to de Morgan's plan later by a different draughtsman who drew it incorrectly, and that Carter, who must have copied de Morgan's plan, repeated the mistake (Kemp 1895: 48). It is unclear when the existing, modern northwestern enclosure wall was built. Nevertheless, the modern wall appears on a survey map dated to 1949 (Figure 63) so must have been built prior to this date and after Barsanti excavated Zone 3 in 1913. It is possible that Barsanti himself had it built.

Zone 4 was first excavated by Barsanti in 1913/1914. Prior to this, de Morgan had left the tell intact here, constructing a modern wall to hold back the unexcavated tell from the temple just as he had in Zone 3. Barsanti did not plan the structures he had revealed in Zone 4 nor indeed record the material that he excavated other than saying the mound here was vast and filled with stone and brick with evidence of quarrying by the sebakheen (Barsanti 1915: 172). His aim had been to excavate down to the floor in Zone 4 but because he was unable to locate it, he instead excavated down to the same level as the sanctuary floor of main temple (Barsanti 1915: 172).

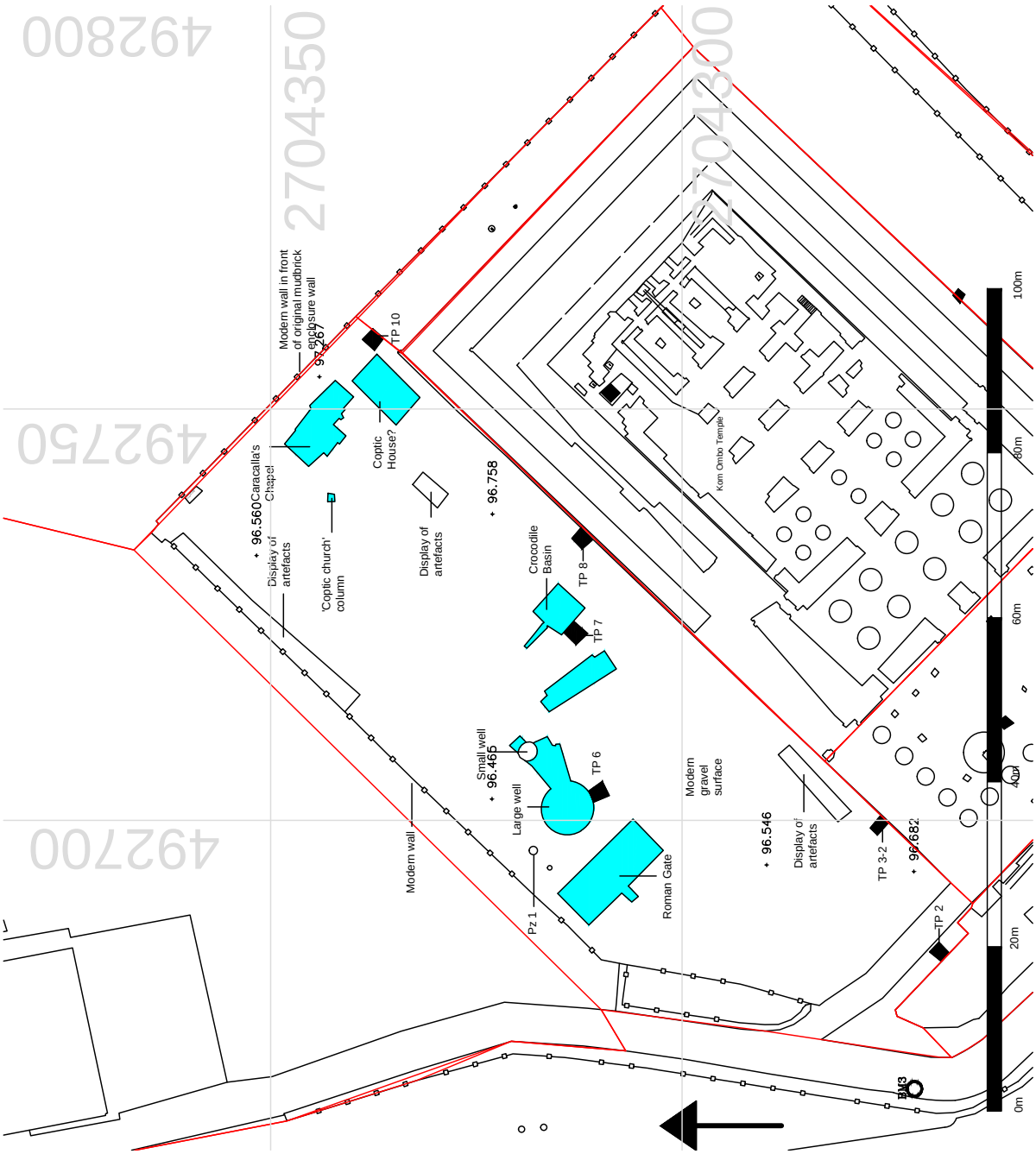


Figure 60. Plan of Zone 4 using the 2015 survey data

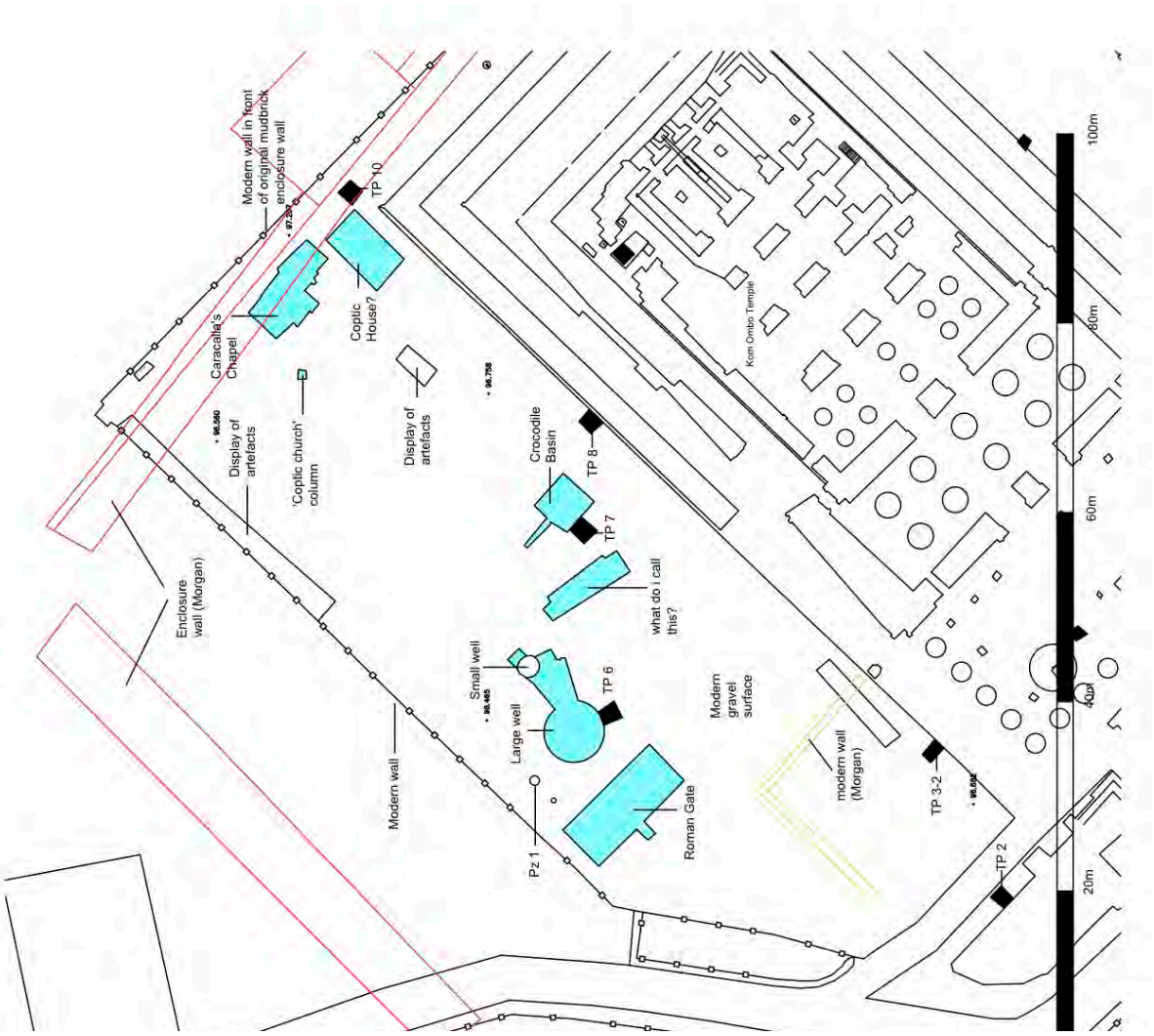


Figure 61. Plan of Zone 4 with de Morgan's plan of the enclosure walls (red) and de Morgan's modern retaining wall (green) overlying the 2015 survey data

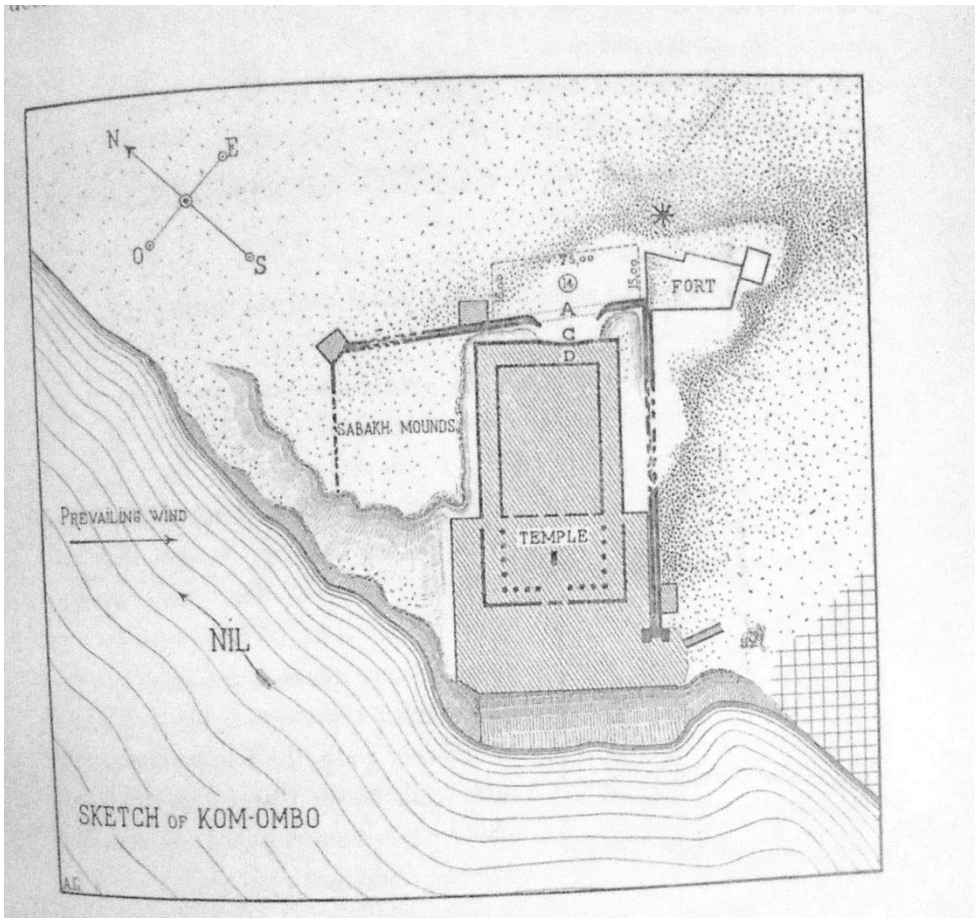


Figure 62. Howard Carter's 1903 sketch map of Kom Ombo temple showing the location of the northwestern enclosure wall. Zone 3 is covered with 'Sebakh Mounds' (Carter 1903, fig 1)

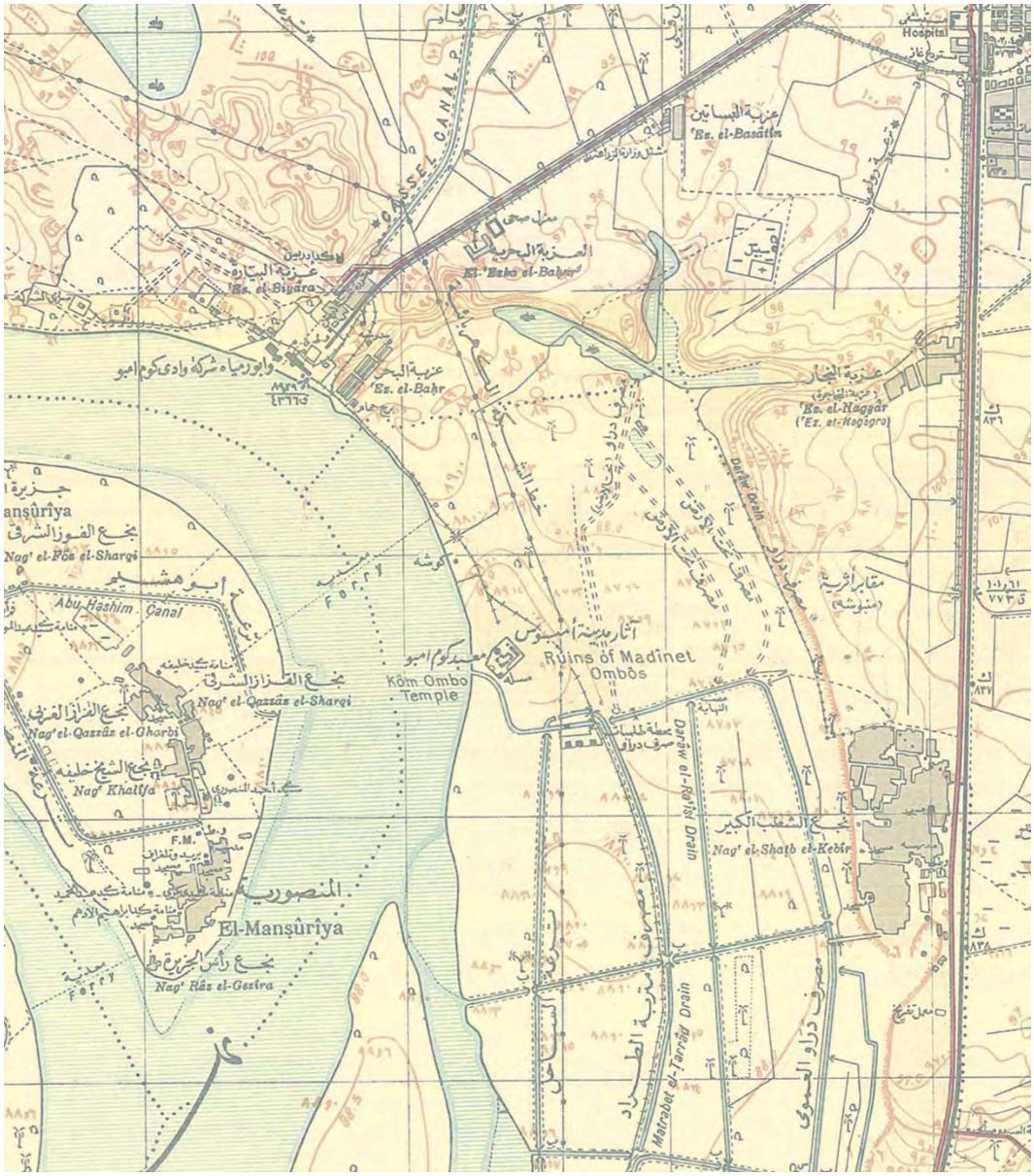


Figure 63. 1949 Survey Map. Note that the modern northwestern enclosure wall is shown

Zone 4 is presently surfaced with modern gravel laid in 2003 (Figure 64). The gravel is at elevatio c. 96.55m asl. Consequently, features that were previously noted by archaeologists on the surface of this area, including mudbrick and a horizon of red burnt mudbrick powder (Kemp 1985 and Jones 1992) are no longer visible. No identiable original floor has been recorded within this area. Zone 3 is a jumble of monuments, some in situ, some not; in some cases it is unclear whether or not they are in situ. The westernmost structure is a Roman period gate. Next to this there is a complex of

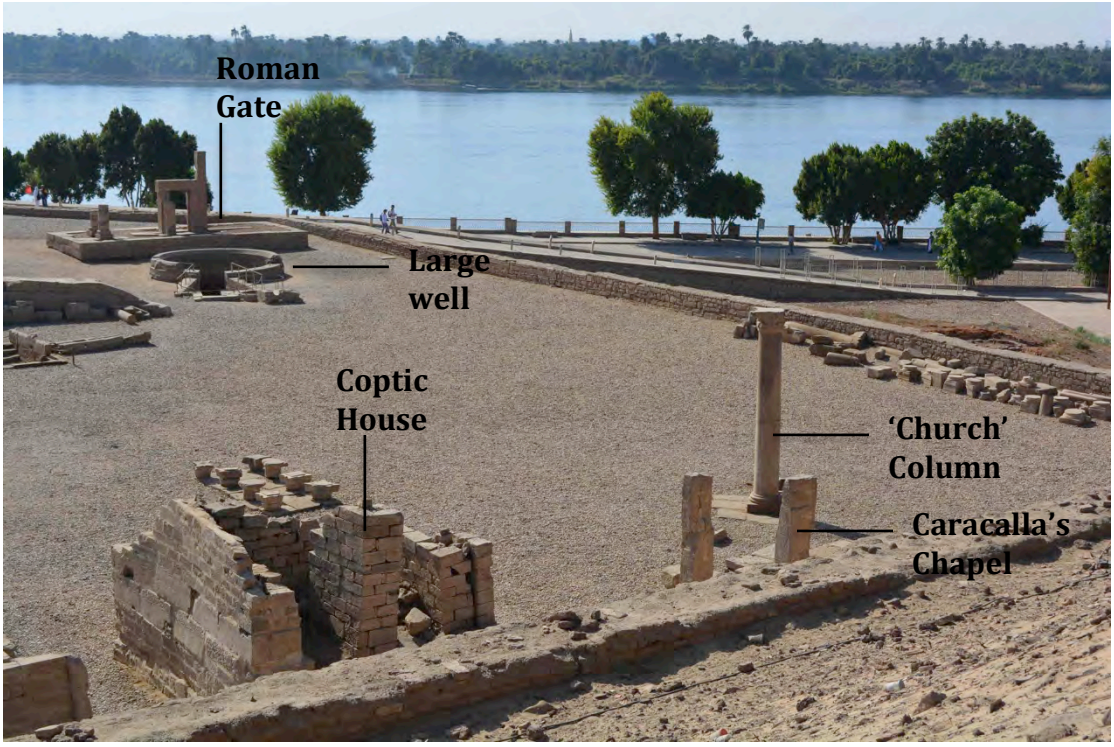


Figure 64. View of Zone 3 in November 2014. W facing

stone-lined wells and tanks, probably associated with the cult of Sobek. To the east is a collection of architectural elements displayed next to the NW enclosure wall while to the southeast of this is the column of what has been interpreted as a church. To the southeast of this is the Chapel of Caracalla and next to this is a structure interpreted as a restored 'Coptic' house.

The Roman gate is located to the west of the central area of Zone 4. The features that make up this structure were exposed and seem to have been relocated by Barsanti to their current position (Barsanti 1915: 172-173). Although Barsanti did not plan the monument, he published two photographs showing it; one before he reconstructed it and one afterwards (Figure 65). In the first photograph, the gate appears above a large mound of what is presumably settlement debris; the top of a nearby column can just be made out, as can a large mudbrick wall. The caption for this photograph is 'La porte romaine dans les ruines de la ville'. The caption and the photograph indicate that the gate had been located relatively high up in the settlement sequence of the tell that Barsanti had removed.

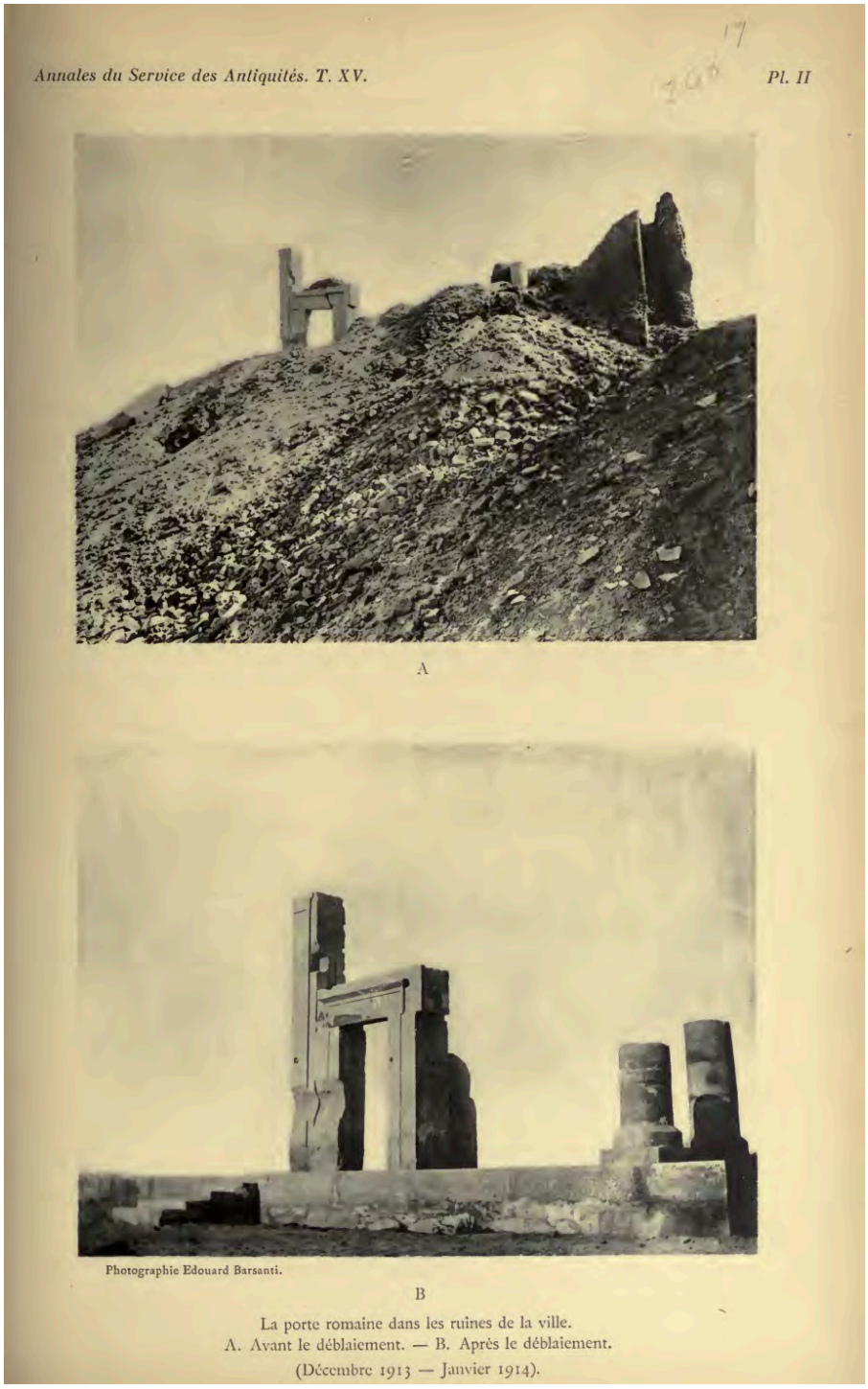


Figure 65. The Roman Gate (Barsanti 1915:pl 2)

In the center of Zone 4 there is a complex assemblage of structures, including a large and a small well, a basin and a stairway. All these elements were first exposed by Barsanti. The large well is extremely deep, because of the high elevation of the temple above the Nile, and measures 5.30 m diameter by

11.5 m deep. Barsanti excavated the material filling the well down to the water level. Barsanti mentions that the fill comprised earth, stones and all kinds of debris (Barsanti 1915: 173). The smaller well measures 1.83 m in diameter and the two wells are connected via an underground passage. According to Barsanti part of the circular parapet that bordered the large well was found to have been removed (Barsanti 1915: 173). To the southeast there are two small stone gullies cut into the rock, one of these leads to a large basin (4.40m E-W by 4.55m N-S). Barsanti suggested that these features might have been related to the cult of Sobek and were installations where crocodiles were hatched (Barsanti1915: 173). Bianchi mentions that some scholars, citing the analogy of the precinct of the Apis Bull at Memphis, suggest that this was a sacred precinct where a living crocodile, the manifestation of the god Sobek, was housed (Bianchi 2005:505). Kemp and Jones (1985 and 1992) bemoaned the lack of study and research on the monuments in the Open Court. This is still the case today.

Along the northeastern limits of Zone 3 there are a number of structures. These include a small chapel dedicated exclusively to Sobek by the Roman emperor Caracalla (AD 198–217), also referred to as the Chapel of Caracalla. This was exposed by Barsanti in 1913-1914. He published a photograph of the stone uprights forming the outer door of the chapel (Figure 66) and described how he had consolidated these features with iron bars. To the right of the door, he found a column base and three small ‘seats in situ’ that he interprets as ‘offering platforms’ (Barsanti 1915: 174). He also mentions that in his excavations he recovered a bust of a queen with the cartouche of Thutmosis III, a chapel door and lintel depicting Ptolemy XIII making offerings, and a piece dated to the reign of Ptolemy VII. Exact find-spots for these items are unclear although they are located in his description under the Caracalla Chapel heading, suggesting perhaps that they were found near this building.

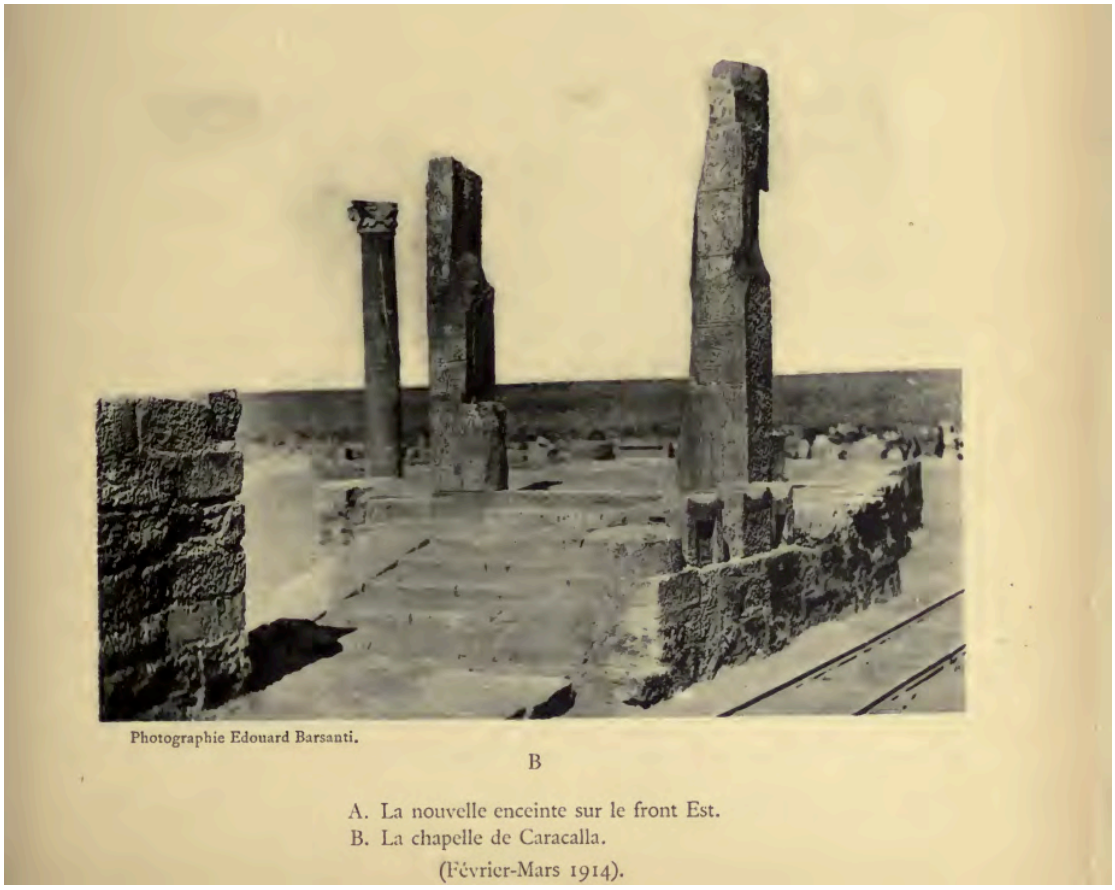


Figure 66. ‘Chapel of Caracalla’ (Barsanti 1915:pl 2, B)

Barsanti describes his discovery of a ‘Coptic period house’, built of mud and stone, located on the east side of the open court, near the outside corner of the temple. Based on its ‘originality’ Barsanti decided to conserve it. Presumably this is the stone structure that stands in this location today (Barsanti 1915 :173) (Figure 67). It is unclear whether this structure originally stood at a higher elevation and was relocated by Barsanti at a lower level, or whether it currently stands on its original elevation. Barsanti mentions that various artifacts, possibly relating to a church, including bronze processional crosses, chalices and lamps were found ‘in the corridor’, perhaps referring to part of the house (Barsanti 1915:173, 174).

Figure 67. Photograph possibly showing the Coptic house at center right (Barsanti 1915: pl. 3, B)

Barsanti also describes the discovery of a church within Zone 4. He reinstated a fallen column of this building in what he describes as its original position based on the recovery of its base in situ. Other bases of associated columns were not found set in the ground (Barsanti 1915:174). Although this 'structure' is often referred to as a church, Jones points out that there is no clear evidence that this identification is certain nor that the column bases were part of a church (Jones 1999:103). Barsanti arranged the 11 bases that he recovered in two parallel rows on an east-west alignment, using the in situ base as the guide of this positioning (Jones 1999:97). The bases were moved some time after 1999 and are now grouped in a pile on the modern gravel that covers Zone 4.

Jones notes that ‘the area to the north of the temple and the northwest, within the enclosure wall, must have remained unencumbered by intrusive building until a relatively late date. The elaborate system of stone-lined wells and tanks located in this part of the temple precinct were probably maintained until the end of the official use of the temple and the cessation of the chapel dedicated by Caracalla (Jones 1999:98).

When Kemp and Jones surveyed the temple and tell in 1979, they recorded a horizon of reddened earth (Figure 68). Kemp writes ‘beside the column bases which mark the site of a Coptic church … the ground is conspicuously reddened (see Figure 10 for the area of reddened earth that Kemp surveyed). Within the soft earth which forms most of this area the sherds are almost entirely Graeco-Roman or later, but a few exceptions can be found, belonging to types more similar to those from the lower levels outside. Within this area, ‘H’ on the map’ (see Figure 10), is also a length of reddened brick wall running at an angle to the axis of the temple. It emerges from beneath the platform on which the Caracalla chapel stands. A small number of bricks was measured, and they were found to fall within the limits of the measurements from exposures ‘A’ to ‘D’. It seems highly likely, therefore, that area ‘H’ is an exposure of an underlying stratum related to the walls outside the enclosure on the northwest’ (Kemp 1985: 45, 46).

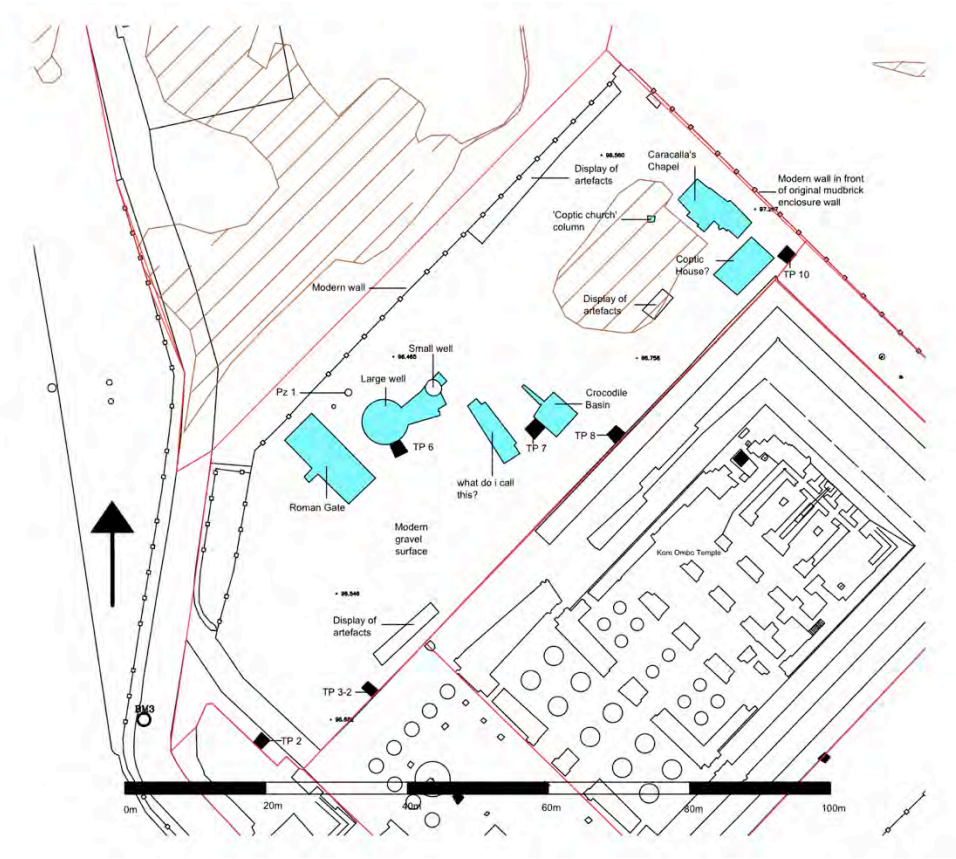
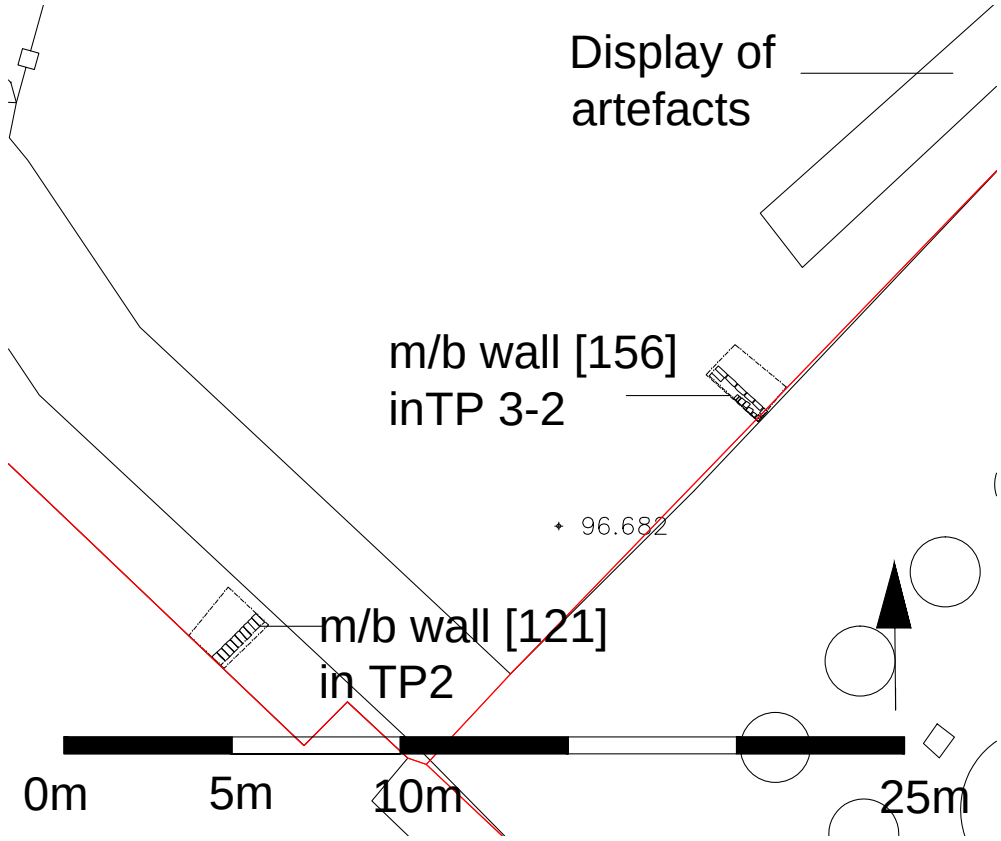


Figure 68. Plan showing area planned by Kemp as reddened earth overlaid onto the 2015 survey data

Test Pits 2, 3.2, 6, 7, 8 and 10 were excavated within Zone 3 as part of the 2015 geotechnical survey. Mudbrick walls stratigraphically earlier than some of the standing monuments were recorded as well as mudbrick walls that were later, and the horizon of red earth (burnt mudbrick powder) stratigraphically earlier than the construction of the outer, stone enclosure wall of the temple. A piezometer (Pz 1) was also drilled within this area; the data from Pz 1 show archaeological deposits down to 7m below the current ground level.

Test Pit 2 was excavated against the northeast face of the Birth House wall. Beneath the make-up for the modern gravel surface, part of a mudbick wall was found orientated north-south [121] abutting, and therefore post-dating the Birth House wall (Figure 69). The mudbrick wall survived only 10cm high (founded at 96.50m asl) and a deposit of mudbrick collapse (presumably from

the wall) respected its northwest face. Beneath the wall a 1.45m there was a thick deposit of silty sand containing sandstone chips deposited after the Birth House wall had been constructed. Beneath this, was recorded a substantial mudbrick wall [124] at 95.78 m asl that filled the whole test pit extending beyond all limits of excavation, including beneath the Birth House sandstone wall (Figure 70). The wall had been partially cut by the foundation trench for the Birth House wall which was founded at 94.93m asl, indicating that the



mudbrick wall [124] survives at least 0.85m high.

Figure 69. Plan showing mudbrick walls [121] and [156] in Test Pits 2 and 3-2.

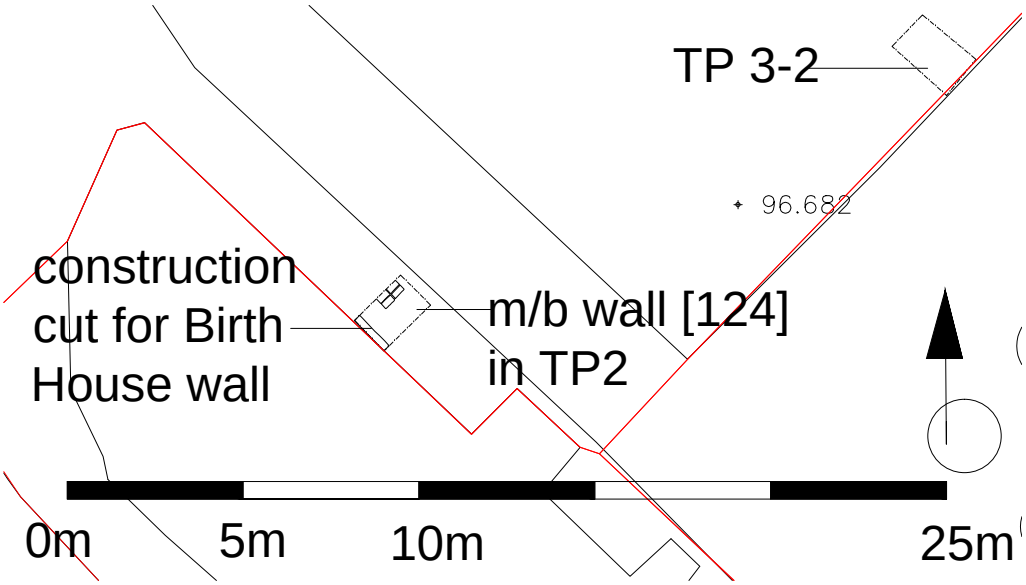


Figure 70. Plan showing mudbrick wall [124] in TP 2

Test Pit 3-2 was excavated against the northwest wall of the forecourt. As with Test Pit 2, in TP 3-2 we did not find the red powder that Kemp recorded on the surface to the northeast. We recorded a mudbrick wall [156] abutting the northwest wall of the forecourt, founded at level 96.05m asl, implying that it post-dates the Roman forecourt (Zone 2). We recorded a 1.68m thick sequence of deposits underlying the wall, which abutted the Roman forecourt wall. Lower down, the face of the wall was stepped. It was unclear whether the base of the wall would have originally been visible as stepped, or whether the irregularity at the base was the foundation of the wall. Depending on the interpretation therefore, the aforementioned 1.68m thick sequence of deposits may either be associated occupation or make-up dumped against the foundations of the stone wall. At 94.51m asl we reached the base of the stone wall foundation where it rested on and partially cut a deposit of silty sand.

Further to the northeast we excavated a test pit against the outer, stone temple enclosure wall (TP 8). Here we found that the wall was founded at exactly the same level as the forecourt wall (to the centimeter) at 94.71m asl. Here the wall was founded on red ash or burnt mudbrick powder, presumably

the same horizon that Kemp recorded on the surface to the northwest. A 1.66m thick deposit of silt mixed with red brick fragments (burnt mudbricks) and sandstone chips had then been dumped, presumably as make-up, against the un-dressed foundation stones of the temple wall, and therefore appeared to have been laid down to create a higher ground level in the Open Court.

To the northwest of this, two test pits were excavated, one against the large well and another against the 'Crocodile Basin' (TP 6 and 7). In TP 7 we recorded a similar sequence to that in TP 8. The same red ash/burnt mudbrick powder horizon was present although at a higher level of 95.61m asl. This was partially cut through for the construction of the 'Crocodile Basin'. After the basin had been constructed, a 0.82m thick deposit of burnt mudbrick tumble had been dumped against the face of the wall. The results from these two investigations suggest that the 'Crocodile Basin' and the outer, stone wall of the temple were built during the same construction phase. It also suggests that either the red powder horizon slopes downwards from north to south or that the red powder was cut, possibly to make a foundation trench for the temple wall at a point further northwest than the limits of TP 8.

A piezometer was drilled to the northwest of the large well. Two meters of clay were found below the 1m deep sandy silt and gravels that appear to make up the modern ground surface here. The clay may be alluvial. Beneath the clay, with an upper elevation of 93.35m asl, we recorded four meters depth of deposits comprising reddish burnt bricks, silty clay and burnt brick. Based on the elevations, this sequence presumably is part of an earlier occupation of the area pre-dating the existing temple.

A further test pit was excavated in the northeast area of Zone 3 (TP 10). Here we exposed a sandstone drain [151] at 96.60m asl sloping downward from north to south, at which point excavation was halted (Figure 71). This feature may be associated with the Caracalla Chapel.

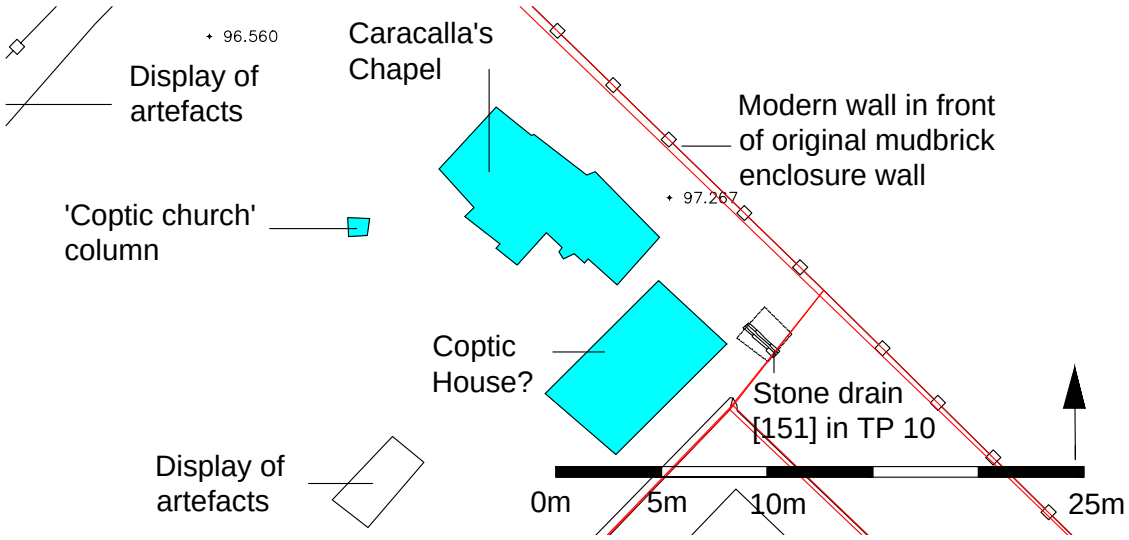


Figure 71. Plan showing stone drain [151] in Test Pit 10

Zone 5

Zone 5 is located between the northeast mudbrick enclosure wall and the northeast sandstone wall of the temple (Figure 72). The space between the two walls measures c. 6.50m. The original sandstone paving survives for the most part within this area, at elevation c. 96.60m asl (Figure 73). At the southeastern end of Zone 5, the tell and overlying sands from Zone 6 slope down onto the paving stones. The original mudbrick enclosure wall in this area (and within Zone 4) is supported by a modern mudbrick wall with buttresses built by Barsanti in 1913 and 1914 (Figure 74).

As already noted the original mudbrick enclosure wall appears to have been planned at an incorrect angle by de Morgan. His plan demonstrates that it was he who cleared this area and shows the mudbrick enclosure wall holding back about 14/15m of the tell behind it. Carter reported in 1902 that 30m of the mudbrick enclosure wall collapsed and the back wall of the temple had been pushed in by the fallen sand and debris (Figure 75).

During the repair work Carter exposed a large fine sandstone stela lying on the ground level. According to Carter this would have been originally fixed on the inner face of the mudbrick enclosure wall. Three stone steps that would have led to the stela were found in situ. The stela showed representations of a king with the cartouches of the emperor Hadrian (AD 117–138) making offerings to various gods (Carter 1903: 174).

A piezometer (Pz 2) was drilled within this area as part of the 2015 geotechnical analysis. Here, beneath the temple pavement and its make-up, was recorded a 0.65m thick layer of red burnt mudbrick powder (see Appendix 4), between 96.24m asl and 95.59m asl. This is at a significantly higher level than the level recorded on what seems to be the same horizon in TP 8 (at 94.71m asl). Beneath this, was recorded a 5m thick deposit of black burnt mudbrick between 95.59m and 90.59m asl. Beneath this silty clay overlay sandy clay; no finds were retrieved from either clay layer. Based on the results from Pz 2, there are archaeological deposits to at least 6m below the current ground level in this area.

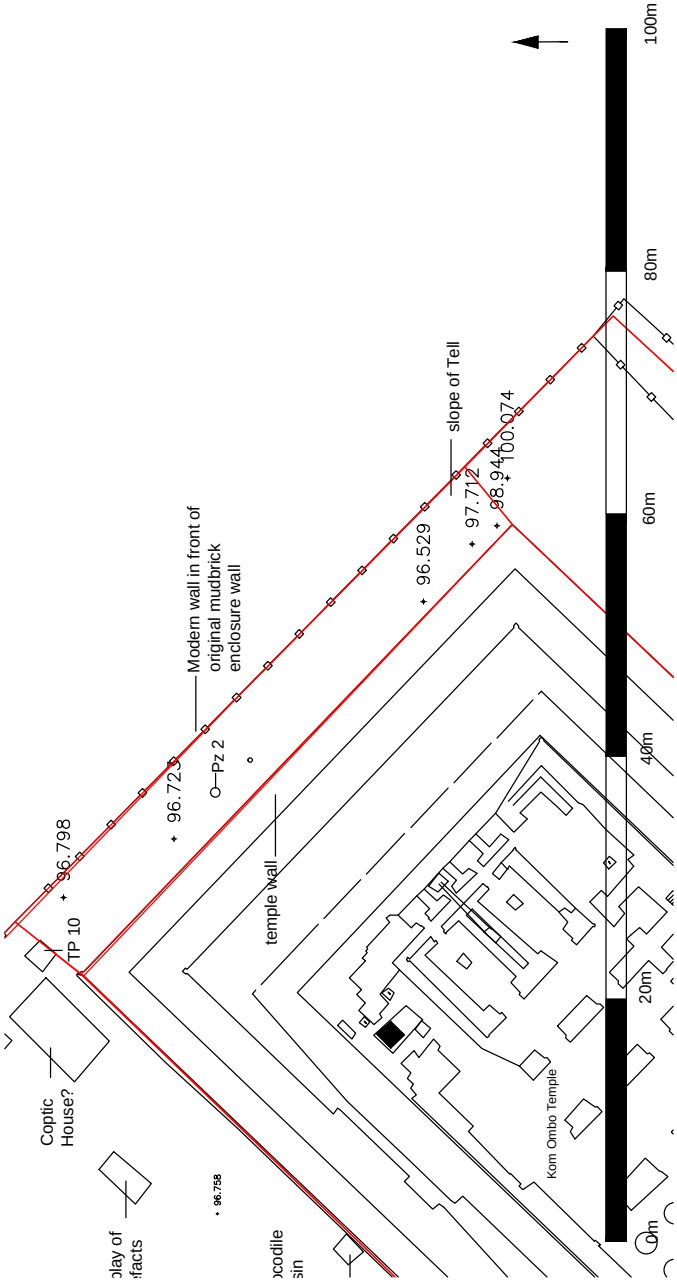


Figure 72. Plan of Zone 5 using 2015 survey data

Figure 73. Photograph of Zone 5. NW facing.

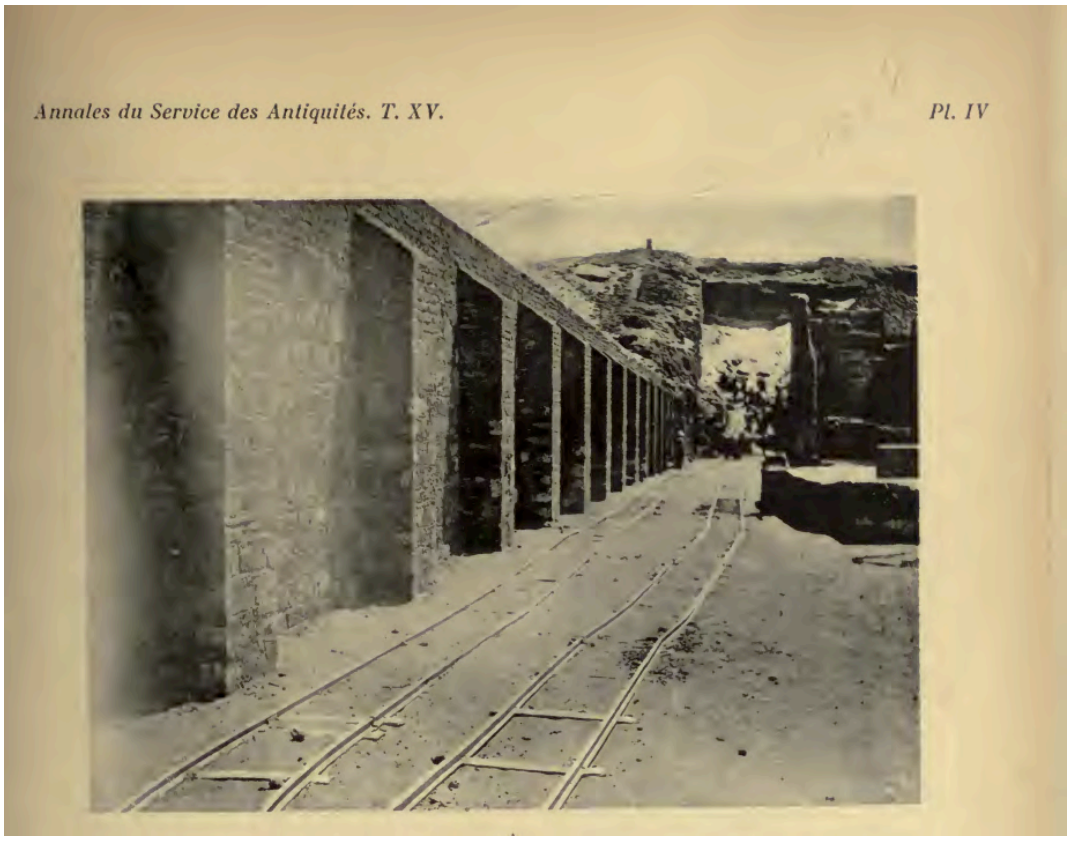


Figure 74. Zone 5 showing the newly built buttressed enclosure wall and the slope of the tell at the southeastern end. SE Facing. (Barsanti 1915: pl. IV)

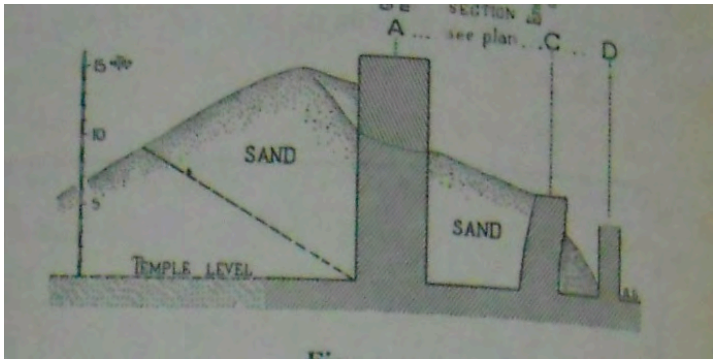


Figure 75. Carter's sketch section through Zone 6 (walls A, C and D). (Carter 1903: fig 2)

Zone 6

Zone 6 is located to the southeast, between the outer temple wall and the mudbrick enclosure wall (Figure 76). This is an area of the tell that was not removed in the early 20th century, unlike in Zones 4 and 5. Instead, de Morgan constructed a mudbrick wall between Zone 6 and Zone 3 to hold back the unexcavated tell (Figure 76). The highest point of the tell is in the northeast (at c. 106.30m asl). From here it slopes down markedly to the west (to c. 99m asl) and to the southwest (to c. 98m asl) (Figures 77 and 78). The mudbrick enclosure wall that bounds this area in the northeast corner is dangerously high, approximately 4m above the adjacent surface of the tell with the mound to the southeast and northeast adding weight against it (Figure 79). Within the mudbrick enclosure wall and at a high elevation, there are recesses which are probably features associated with structures, now removed, once built against the wall within the tell. The surface of Zone 6 comprises loose sand, collapsed mudbrick and pottery representing aeolian deposition, collapse of the enclosure wall and sebakh digging debris. However, there are a series of mudbrick walls clearly visible on the surface (Figure 78). These have not yet been planned.

There have been some complex rebuilds and consolidation of the enclosure wall of the temple (Figure 80). A large portion of it has been rebuilt in

mudbrick in modern times, although we were unable to ascertain exactly when this was done. The outer face of the modern mudbrick wall is buttressed for added support. While the original stone wall survives in part on the inner face (Figure 81) this is not visible for the majority of the outer face. As part of the 2015 geotechnical data collection we excavated a test pit against the outer face (TP 11) intended to locate the foundation of the stone wall. The trench was extremely difficult to excavate as debris from the tell tumbled into the trench making it unstable and dangerous. Due to these conditions, excavation of the trench was prematurely halted. However, we did find that the upper deposits consisted wholly of modern material. Beneath this we identified a modern cut that appears to be have been a foundation trench for the modern mudbrick wall, and an underlying modern stone foundation (at 96.67m asl). The fill of the cut was a deposit containing modern burnt rubbish that also abutted the modern construction. On the surface of Zone 6, there are traces of what may be the continuation of this foundation trench filled with sand, against the outer face of the wall.

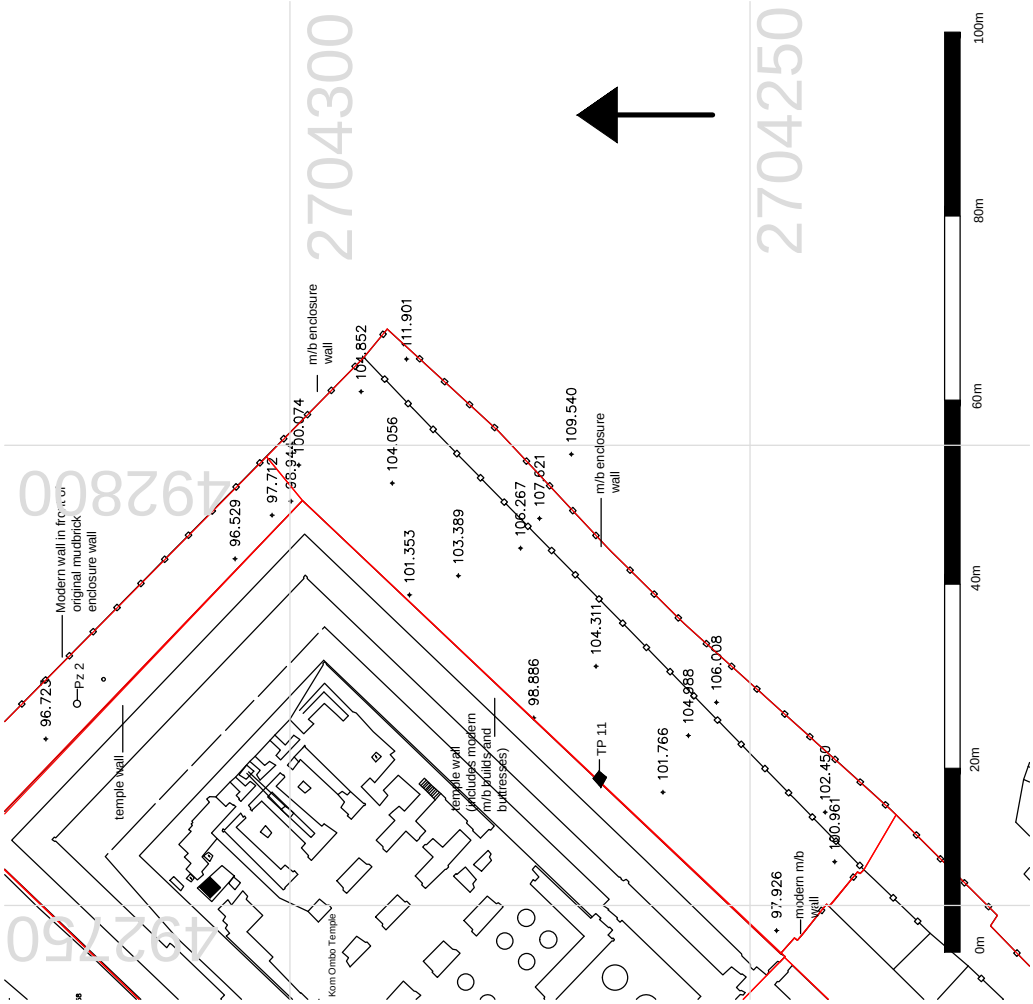


Figure 76. Plan of Zone 6 using 2015 survey data

Figure 77. The mudbrick enclosure walls bounding Zone 6 and the slope of the tell within Zone 6. NE facing

Figure 78. The slope of the tell in Zone 6 showing mudbrick architecture visible on the surface. SW facing

Figure 79. The inner face of the northeast mudbrick enclosure wall. SE facing

Figure 80. Complex rebuilds/repairs/restoration of the NE corner of the temple wall. SW facing

Figure 81. The inner face of the southeastern wall of the temple. E. facing

Zones 7 and 8

The temple is bounded to the northeast and southeast by the ancient tell representing deeply stratified archaeological deposits derived from ancient settlement. Zone 8 incorporates the majority of the existing tell to the northeast and southeast. Zone 7 incorporates an area where the tell has been partially removed leaving archaeological horizons that are lower than the temple floor and which are likely to predate the Ptolemaic temple (Figure 82). Aerial photographs show the existing topography of these areas (Figure 83). A contour survey conducted by CDM Smith in 2015 (Figures 84, 85 and 86) is the first to have been done since de Morgan's and Kemp's surveys in the 1890s and 1979 (see below).

De Morgan's contour map of the tell was drawn after some, if not all, of the late 19th century clearance (figure 87, figure 88). The contours show a

substantial mound with two peaks, 20m higher than the surrounding field level, one to the southeast and one to the north with levels of 113m and 112m asl respectively. On the southeast peak there is a large structure identifiable as Turkish fort, shown above the SE enclosure wall of the temple. There is a linear structure and a rectangular structure on the northern peak connected by a wall. Next to the rectangular structure, possibly a fort or look-out post, de Morgan shows three mudbrick walls. This northern fort or look-out is clear in Figure 89. The tell is still present although presumably cut away inside the enclosure to the NW of the temple and between the temple's SE stone outer wall and the mudbrick enclosure wall. A large mudbrick structure, possibly a buttress, is shown abutting the NE mudbrick enclosure wall (Figure 89). A photograph taken in 1890, apparently after the clearance had begun, seems to show the NE mudbrick enclosure wall and the eastern fort (Figure 90) and de Morgan's photographs of the area clearly show the tell, forts and enclosure walls (Figures 91 and 92). The temple and parts of the tell were again mapped in 1902 by Carter (Figure 93).

Prior to 1985 very little information had been published on the tell. It has mainly been relegated to the background where it frequently appears incidentally, 'in the background' of photographs of the temple. In 1979 Barry Kemp and Michael Jones conducted a non intrusive study of the tell (Figure 94) studying evidence of an Old Kingdom to First Intermediate Period (c. 2300-2200 BC) phase of settlement and quantifying the amount of tell removal that occurred between the creation of de Morgan's map and 1979 (Kemp 1985). Their study shows that during this roughly eighty year period, the northern part of the mound (the northern high mound mapped by de Morgan) had completely disappeared (Figure 95), reduced to a level commensurate with the surrounding fields (Kemp 1985:41), and a large U-shaped sebakh quarry had been cut through the northeastern part of the mound (Figure 96). The lower slopes of the mound had been irregularly dug away along much of their length (Kemp 1985:41) but the southeastern peak of the mound had been maintained and remains so today.

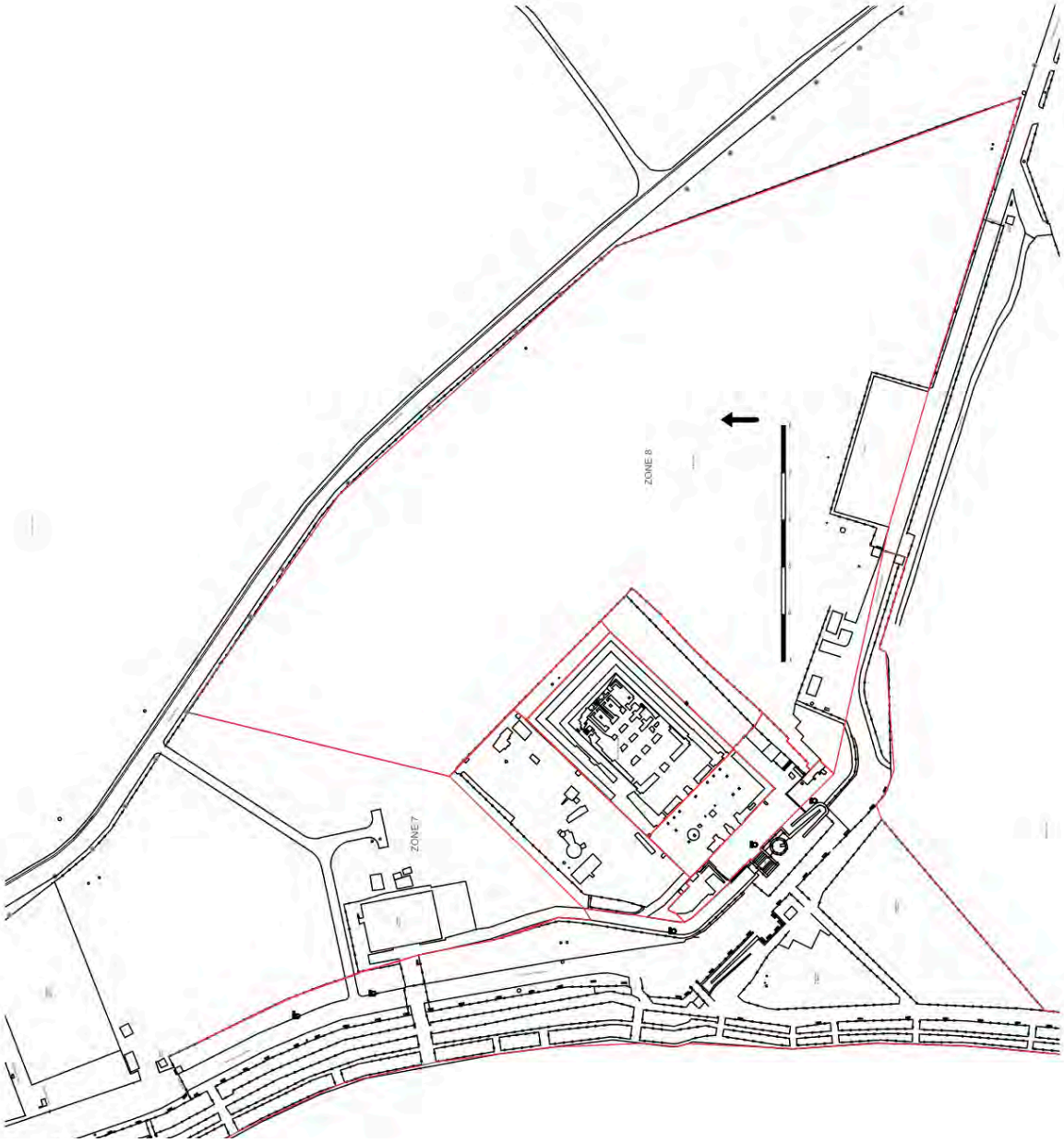


Figure 82. Plan showing the boundaries of Zones 7 and 8 using 2015 survey data

Figure 83. Aerial photograph of the temple and tell taken in 2013

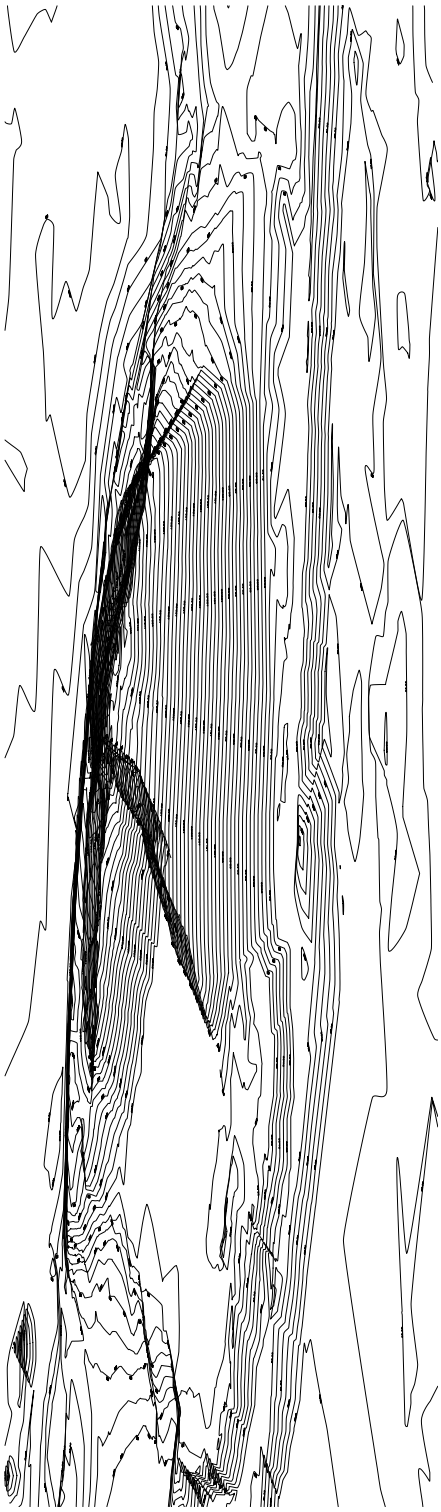


Figure 84. Contour map. View towards the east showing the tell mound. Map produced using 2015 CDM Smith survey data

Figure 85. Contour map. View towards the northeast. Map produced using 2015 CDM Smith survey data

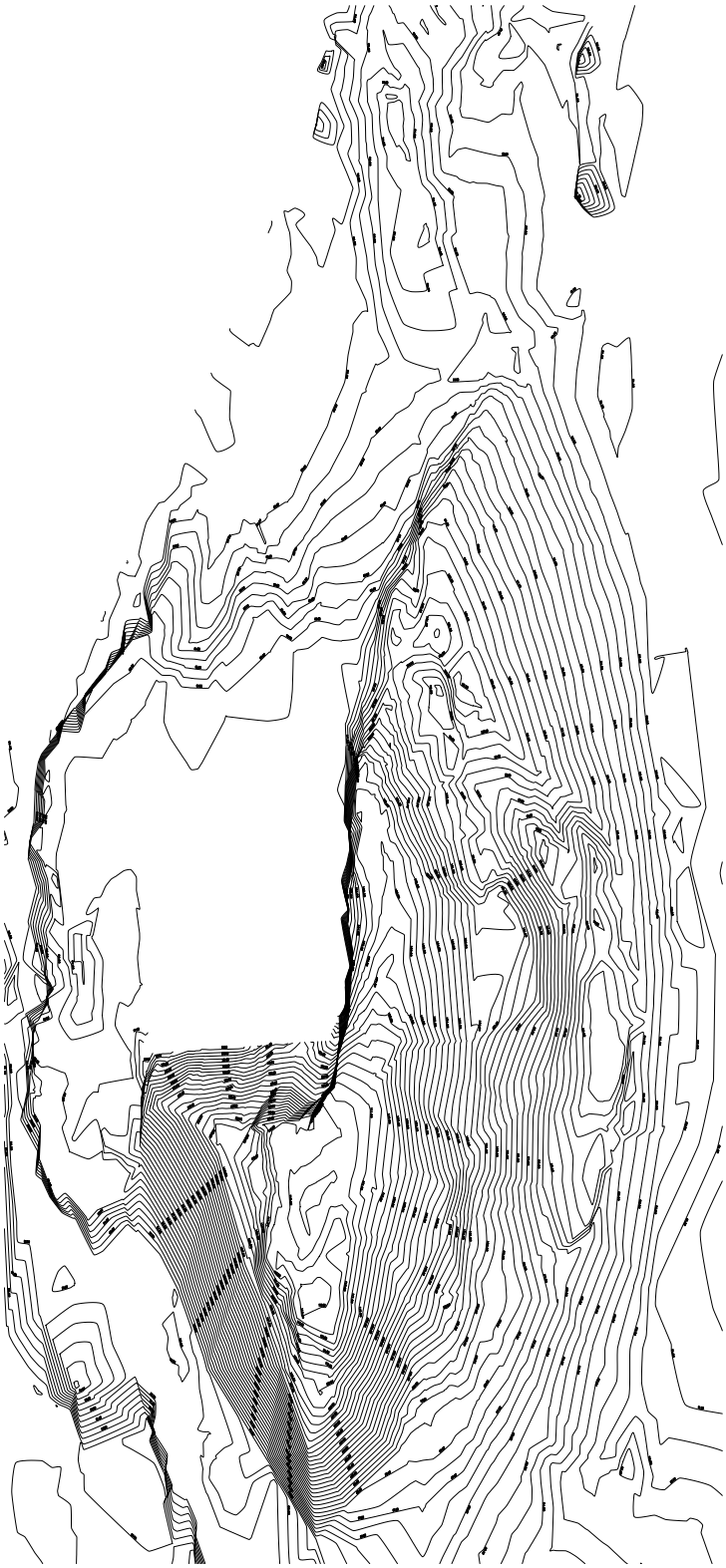


Figure 86. Contour map. View to the west. Map produced using 2015 CDM Smith survey data

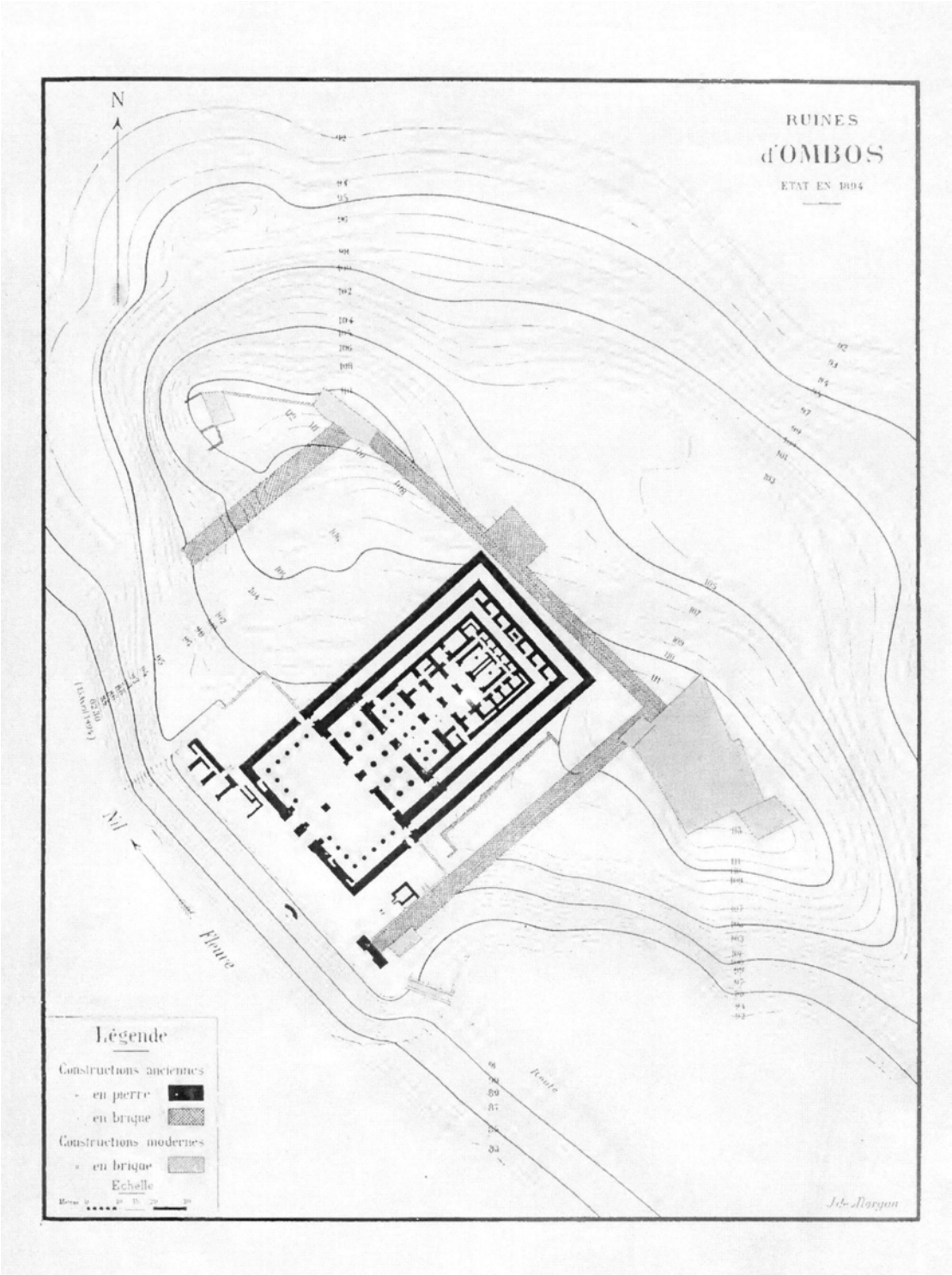


Figure 87. De Morgan's map of the tell and the temple (de Morgan 1895: frontispiece)

Figure 88. The contours (by 5m) and features planned by de Morgan overlain on the 2015 survey data

Figure 89. Photograph of the temple and tell. N facing. (Denisson Ross 1931)

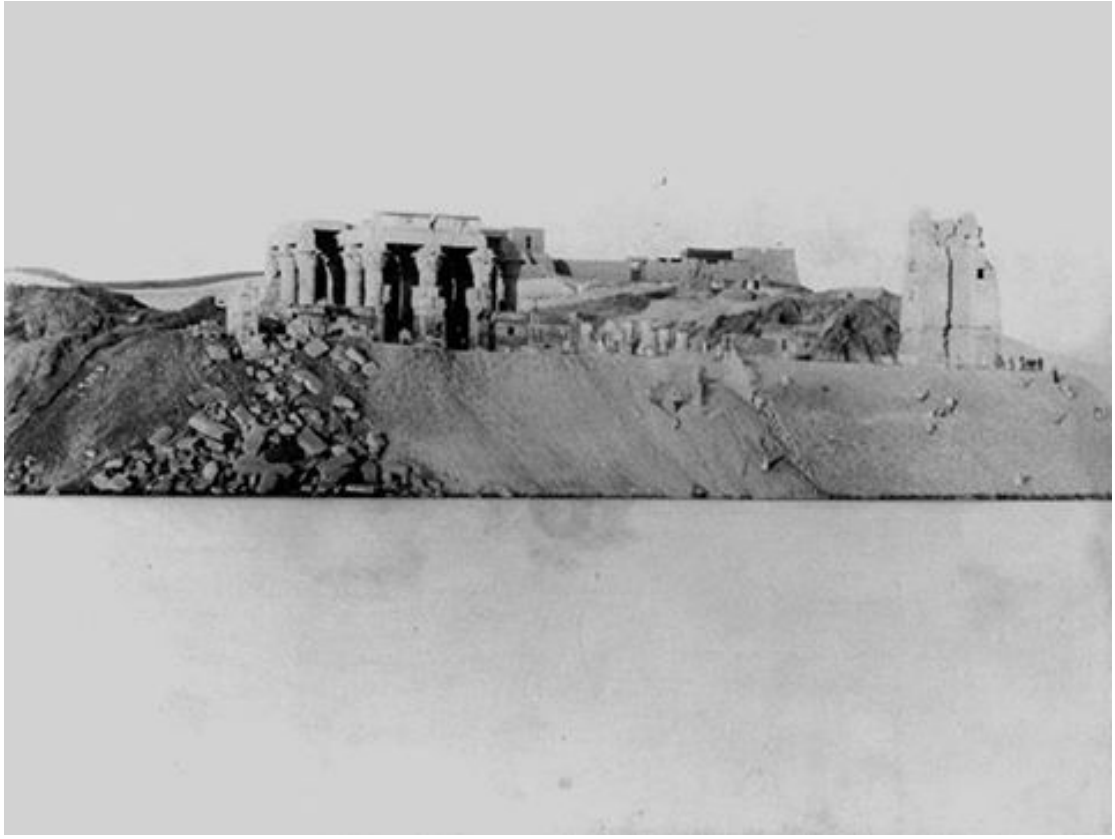


Figure 90. Kom Ombo 1895-1900. NE facing

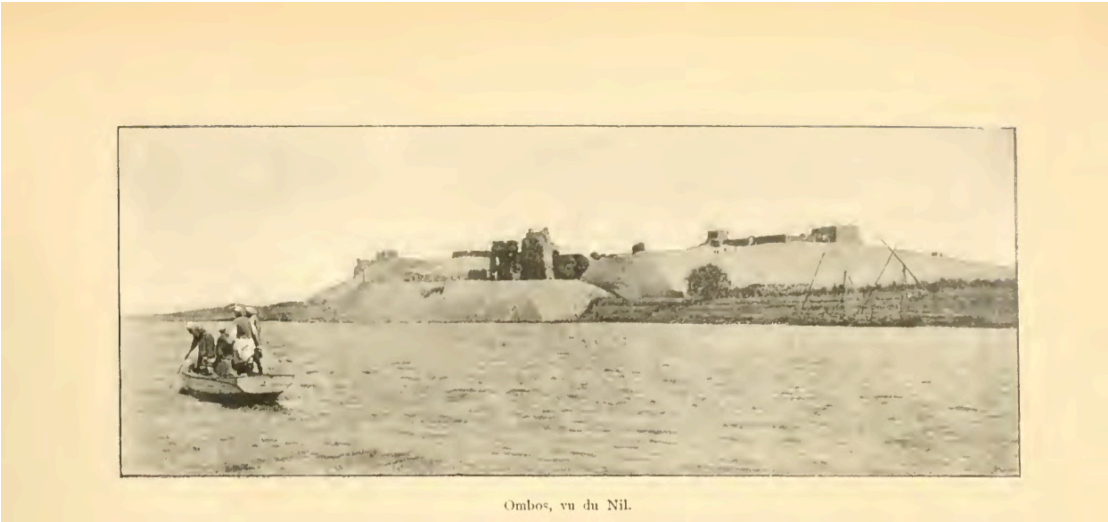


Figure 91. View of the temple and tell in 1895. NE facing. (de Morgan 1895: 1

Figure 92. Views of temple and tell. N (left) and SE (right) facing. (De Morgan 1895:frontispiece)

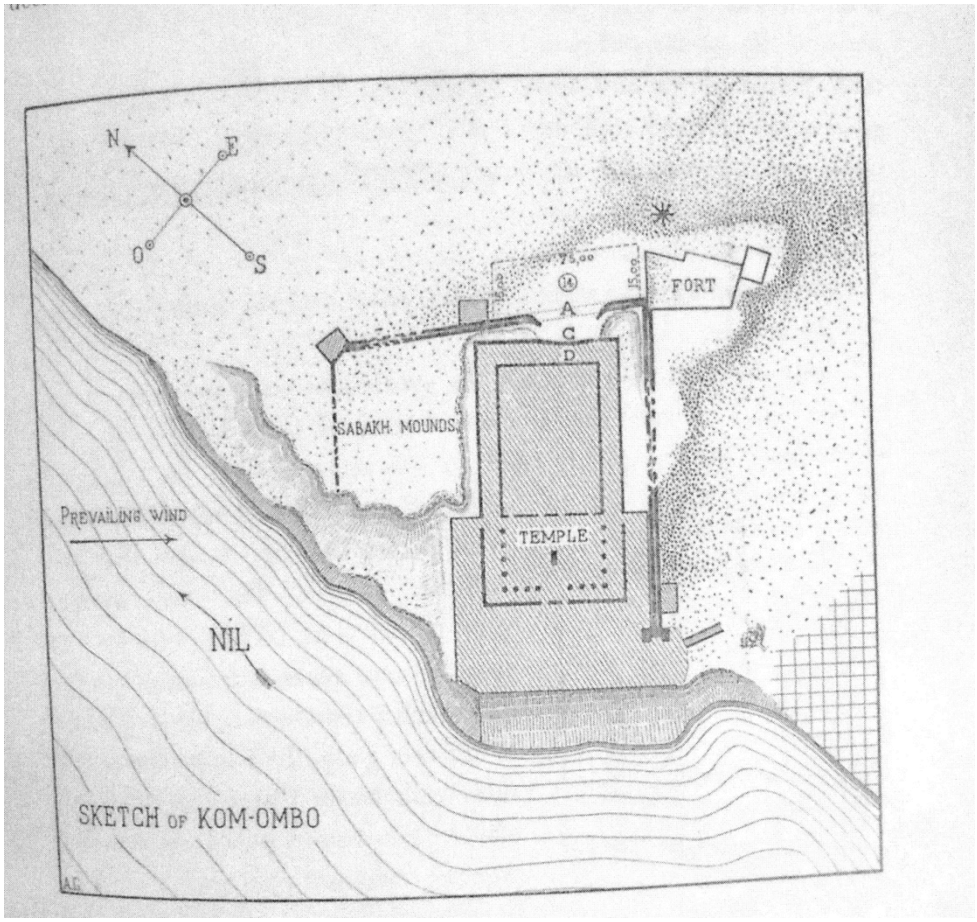


Figure 93. Plan of the temple and tell. (Carter 1903: fig 1)

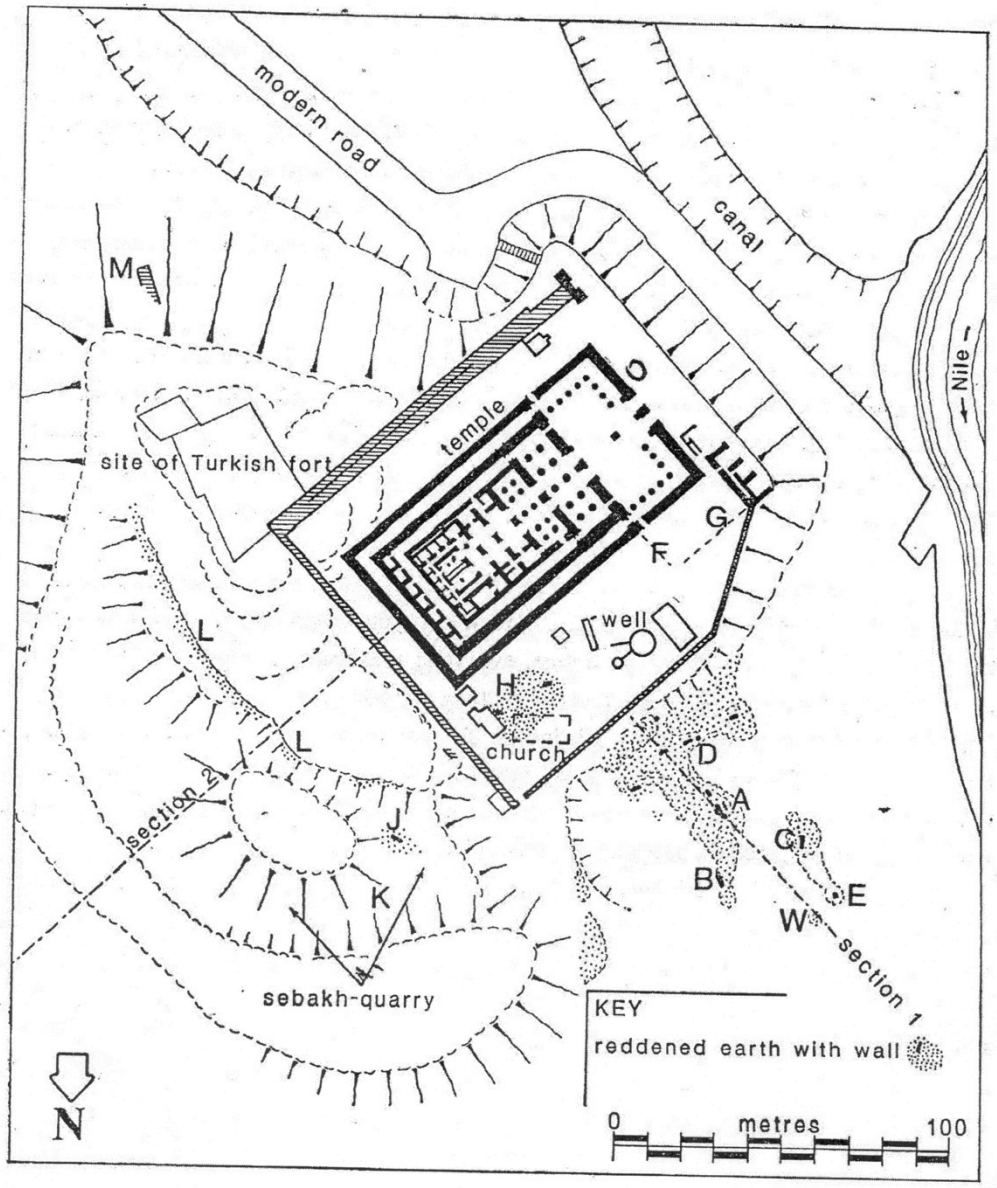


Fig. 1.

Figure 94. Plan of the temple and tell (Kemp 1985:fig 1)

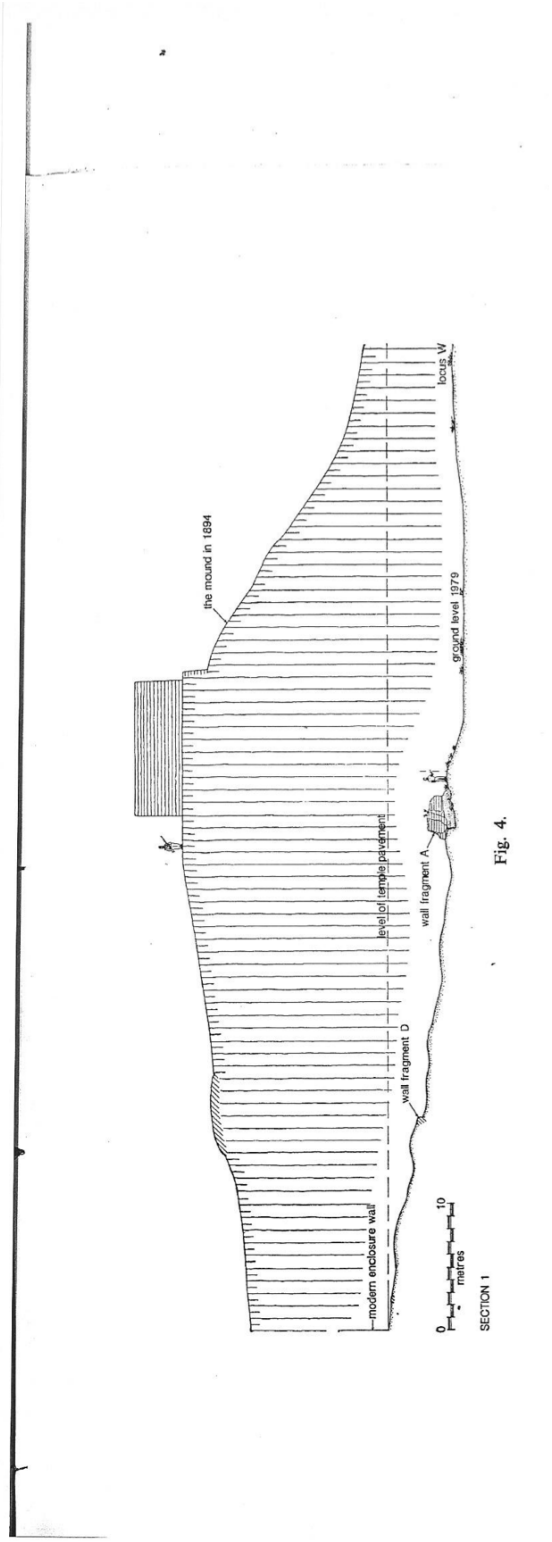


Fig. 4.

Figure 95. Section through deposits in the northern limits of the tell removed since de Morgan's contour map. is marked on Kemp's plan; Section 1 on Figure 10 above. (Kemp 1985: fig 4)

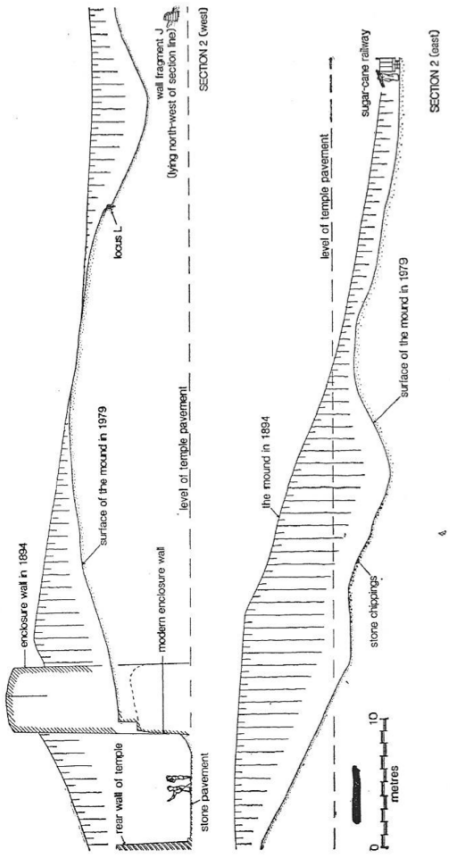


Fig. 6.

Figure 96. Section through deposits removed after De Morgan's contour map, in the southeastern limits of the Tell. The location of this section is marked on Kemp's plan; Section 2 on Figure 10 above. (Kemp 1985: fig 6)

Zone 7

Zone 7 contains a number of modern buildings, including the Crocodile Museum and the Magazine (Figure 97). A ramp leading to the museum slopes downwards to the north from the temple (Figure 98). In front of the museum there is a shaded outdoor area with a concrete floor and foundations. The level within this area is c. 5.70 m lower than the floor of the temple and c. 3.50 m lower than the ground level adjacent to the northwest modern enclosure wall of Zone 4.

As previously described in Section 7.2, a series of known archaeological investigations were conducted between 1986 and 2014 within the area designated here as Zone 7. The locations of these are marked on Figure 97 as sites 1 through 5. The information for these investigations has come from personal communications with previous excavators, site observations, and site reports housed at the Kom Ombo Inspectorate Office. The walls are burnt red and there are circular features resembling kilns or ovens among them (Figures 99, 100, 101). The area is scattered with potsherds. These are the walls that were exposed by the SCA excavation of Site Kom Ombo 1 in 2003 and which were interpreted as being part of a pottery workshop. A number of artefacts were recovered from the excavation including complete plain pottery vessels comprising dishes, bowls, cooking pots and their lids made from Nile clay fabrics. The collection also included sherds decorated with black painted bands and dots. A tubular Nile clay bread mold and one jar made in marl clay (Qena-Ballas ware), three demotic ostraca with black ink writing and an ink-well were also found here.

To the northeast of Site 5, we noted a red granite column base, lying on the surface of the sand, presumably put here after recovery from a nearby undocumented excavation or sebakh digging (Figure 102).

Excavations carried out in 1986 to the northwest of this area, somewhere within Site 4, uncovered the remains of a mud brick wall and part of a stela

dated, by the names of Amenhotep II[5] (18th Dynasty; c. 1427 – 1401 BC), suggesting the presence of New Kingdom remains here; the wall may have been Kemp's wall A (see below). Circumstantial evidence in the form of several displaced inscribed stone building blocks, stelae and an in situ gate of Hatshepsut and Tuthmosis III now destroyed but seen by Champolion and Lepsius in the1820s and 1840s in the south enclosure wall (Porter and Moss 1991:200) as well as blocks of Tuthmosis III and Ramesses III built into Birth House (Porter and Moss 1991:199) suggests that the Ptolemaic temple replaced an earlier New Kingdom temple

In 1979, before the various new constructions and implementation of the Kom Ombo development program, Kemp surveyed the area around Site 5 and Site 4. Here, beneath the high mound that had already been removed (mapped by de Morgan and photographed in the 19th century) Kemp recorded large areas of burnt earth (red powder) and remains of burnt mudbrick walls at a lower elevation than the temple floor (Kemp 1985:41) (Figure 103). The bricks used in these burnt walls were all of similar sizes and the pottery associated with them (surface scatter) could be dated to the Old Kingdom (Kemp 1985:51-52). Kemp interpreted the red, burnt material as an archaeological horizon that he also observed in Zone 4 and at a significantly higher elevation in Zone 8 (Kemp 1985: 44). He hypothesized that this represented a burning of an Old Kingdom/First Intermediate Period settlement upon which, and cut into which, the Ptolemaic temple was constructed (Kemp 1985:50). He recorded a relatively substantial mudbrick wall (labeled A) which was located in the area of the concrete surface in front of the museum (and therefore is now destroyed) which he suggested may have been part of an early enclosure wall (Kemp 1985:43).

To the north of this, the 2012 and 2013 MoA excavations of Site 3 recorded a sequence of deposits consisting of fine sand mixed with modern material. These overlay a compact clay layer; on this surface, or cut through this

[5] Dr Usama Abdel Wareth, personal communication 2014. Dr Usama conducted the excavation on the site in 1986. He is currently Director of the Children's Museum in Cairo.

surface, an infant skeleton with a crushed skull, estimated at 3-5 years old, was excavated (Kom Ombo Inspectorate Office 2013:1-2). Within Site 2 ‘broken potsherds’ were recovered (Kom Ombo Inspectorate Office 2013:1-2).

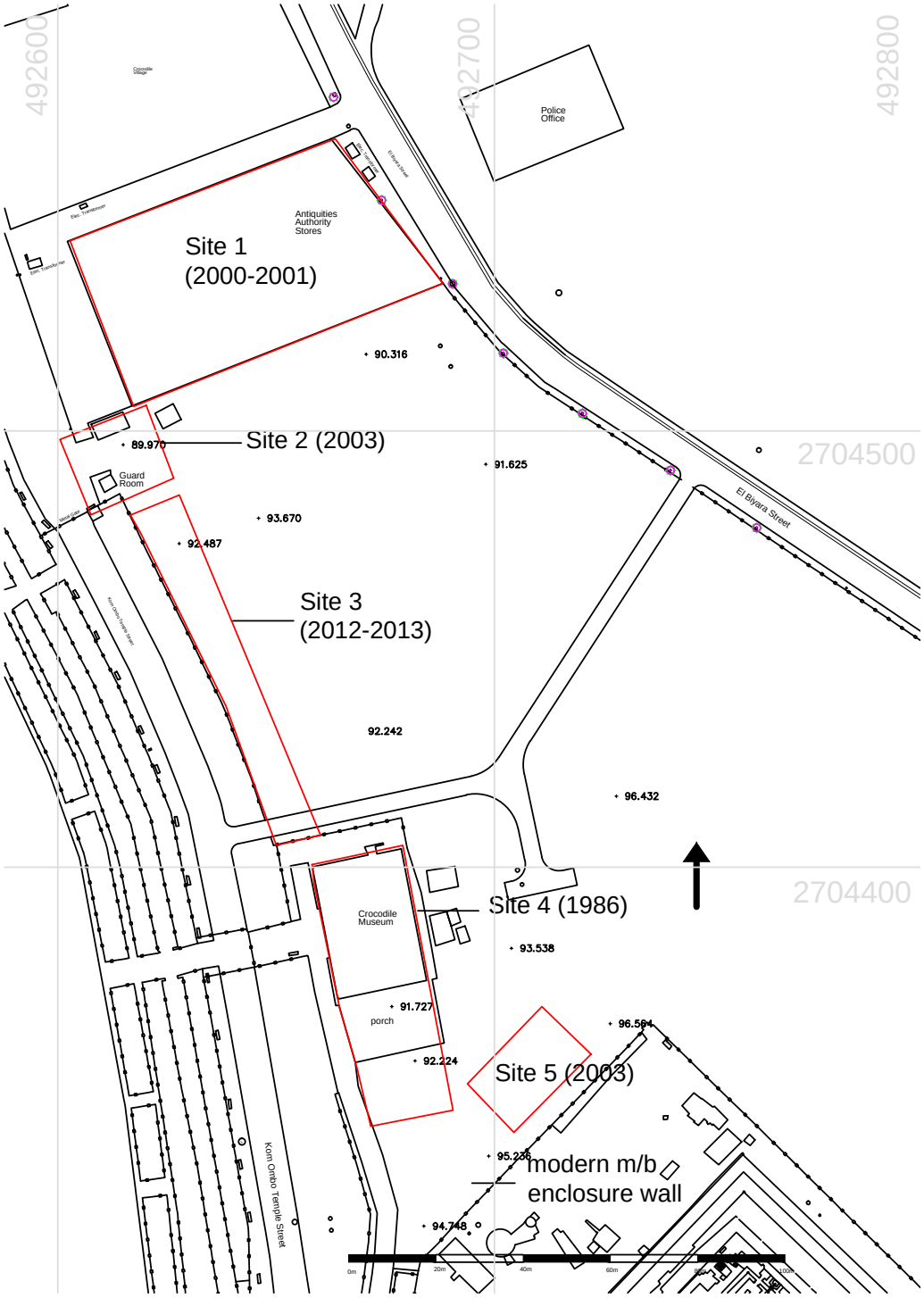


Figure 97. Plan of Zone 7 using 2015 survey data showing the limits of previous excavation areas

Figure 98. View showing the ramp leading down to Crocodile Museum in Nov. 2014. N facing

Figure 99. View showing the mudbrick walls of Area 4 in Nov. 2014. NW facing

Figure 100. Detail of the burnt walls in Area 4. SW facing

Figure 101. View showing the slope of the ground level from Area 4 down to the Crocodile Museum. N facing

Figure 102. Red Granite column base lying on sand in Zone 7

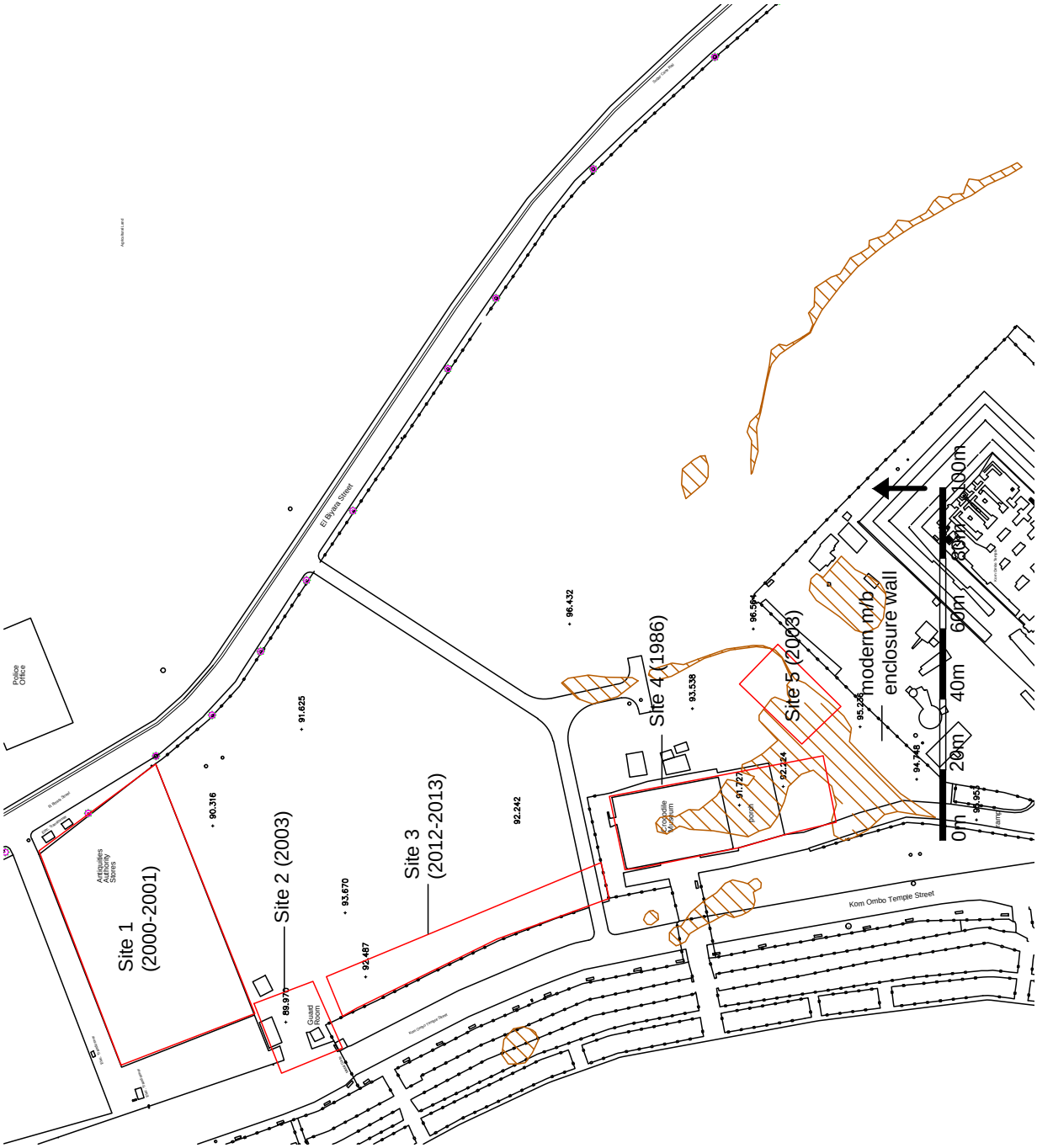


Figure 103. Areas of burnt earth and mudbrick walls as planned by Kemp in 1979 (1985:fig 1) overlaid on the 2015 survey data

Zone 8

Zone 8 comprises the majority of the surviving tell, part of a modern enclosure wall constructed near to the road, a car park, security kiosks and bathrooms (Figure 104).

The highest point of the tell is at c. 112.40 m asl, beside the southeast corner of the mudbrick enclosure wall (Figure 105). Here the foundations of the Ottoman Fort survives. A modern security look-out shelter has been built on the foundations. Since Kemp's survey of the mound in 1979 (Kemp 1985: figure 1) between 1989 and 1991, the SCA has conducted excavations on the mound, removing approximately '45,000 cubic meters of earth and sand' to the southeast of the temple (Wareth and Wagner 1993:295). The mudbrick walls exposed during the course of these excavations are clearly visible (Figures 106 and 107). The excavations were in response to an overall study of the condition of the temple at that time in which three areas of concern were highlighted: an infestation of insects in the temple, the restoration of the temple and the danger of the sub-surface water (Wareth and Wagner 1993:295). The Centre of Research and Maintenance of Monuments recommended that the sand behind the temple be removed since it was seen that this was a good environment for the multiplication of insects that were having a damaging effect on the stones of the temple (particularly the inscriptions; Wareth and Wagner 1993:295). The type of insect, type of damage and reasons for their outbreak is not mentioned within the report (Wareth and Wagner 1993). They also recommended the removal of sand dunes on the south and northeast outskirts of the tell, between the agricultural area and the tell, to mitigate the issue of groundwater in the temple.

It was agreed that since the temple has been affected by the subsoil water because the sand surrounding it reaches the depth of the drainage from the surrounding agricultural lands, and the sand transports the subsoil water by capillarity rise. (Wareth and Wagner 1993:295). It was decided that the excavated sand would be used in the make-up of a widened road leading to the temple (Wareth and Wagner 1993:295). Excavation began on the souwestern and southern sides of the tell leaving a 5m wide strip of

unexcavated sand next to the enclosure wall. Wareth and Wagner write 'excavation work started on the farthest west of the Kom and southern borders of the temple.., moving eastwards, as well as on the eastern side and below the ancient wall surrounding the temple. Leaving an amount of sand (5.0m width) it was intended not to affect the enclosure wall of the temple by the removal of the sand' (Wareth and Wagner 1993:295). Wareth and Wagner mention that the upper buildings of the Kom had been erected on a 2m high sand foundation and that during their sand clearance they left considerable amounts of sand in situ so as not to destroy the mudbrick buildings on the southern slope of the kom (Wareth and Wagner 1993:296). To the east the team observed a thick mudbrick wall, orientated west to south, which intersected with another that returns to the north. Eastward from this, along the southern slope of the Kom the team recovered a large amount of hieratic, ostraca with texts in Greek, Latin, Greek, Demotic, Coptic and Arabic. More large mudbrick walls were revealed (east-west and north-south) and a 2 m by 1.50 m mudbrick vault. At the southern foot of the kom the team found five human mummies and the mummy of a crocodile. According to Wareth and Wagner these were 'found amidst the sand thought to have been dislocated and originating from the cemetery of Shatb el-Kebir further east'.

The excavations produced a significant quantity of ostraca, including Ptolemaic tax receipts, private receipts, accounts, lists and dockets. One such receipt is dated to 174 BC (Wareth and Wagner 1993:297). The Roman period texts are mainly in Greek, but a few are in Latin. The ostraca in Latin are connected with the Roman army. Almost all the documents are dated to the 1st Century AD, with a particular frequency in the reign of the Emperor Augustus.

Between 1990 and 1991 the SCA registered 259 ostraca, out of a total of 400 pieces. Of the 259 inventoried, the majority are dated to the Roman Period, particularly the 1st and 2nd centuries AD with a high proportion of them in the 1st century AD. The tax-receipts are in the range of the reigns of Augustus to Marcus Aurelius (27 BC–AD 180) with about twelve dated to Augustus, fifteen to Tiberius, five or six to Caligula, eleven to Claudius, eight to Nero, two to

Domitianus, two to Nero, fifteen to Trajan, about ten to Hadrian, four to Antoninus Pius and one to Marcus Aurelius (Wagner 1995:121).

To the northeast of Zone 8, where a U-shaped sebakh quarry had been excavated out of the tell, Kemp was able to observe some of the stratigraphic sequence in his 1979 survey (Kemp 1985). Here he records (marked as L on Figure 10) a stratum of reddened earth at c. 6m above the level of the temple floor (Kemp 1985: fig.6) containing brick fragments (sometimes reddened), associated with 'Pharaonic' sherds. Kemp interpreted this as the same reddened earth horizon he observed in Zones 4 and 7 (at a considerably lower level). He recorded the upper interface as being well defined and covered with weathered pieces of sandstone and sherds. On this there is a layer with grass, twigs and Graeco-Roman sherds. Kemp hypothesized that 'following the destruction by fire of the Pharaonic levels, much of the site was abandoned, and the upper surface of the mound left exposed to weathering. After a considerable interval deposits from settlement began to build up again, perhaps beginning only in the Ptolemaic Period' (Kemp 1985:47). To the northwest of this, Kemp records another wall (marked as J on Figure 10) with bricks similar in dimensions to those in the 'early level' walls. This is at a much lower elevation and may have been the outskirts of the early settlement. Kemp's 1979 study led him to estimate the size of the early town in the Old Kingdom/First Intermediate Period as c. 200m long, with the Ptolemaic temple having been built within a hollow scooped out of the old mound (Kemp 1985:50).

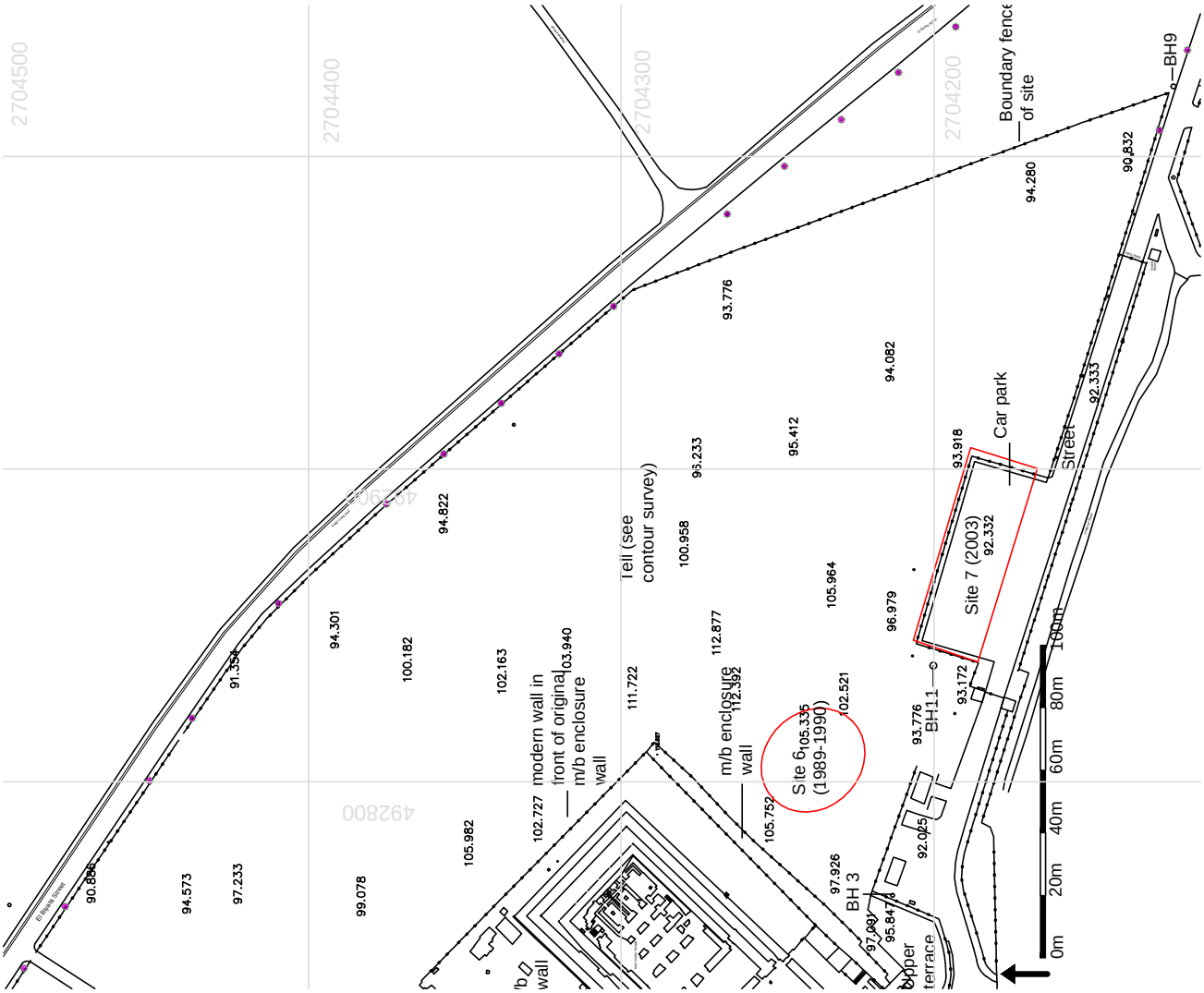


Figure 104. Plan of Zone 8 using 2015 survey data also showing previous excavation areas and locations of the 2015 boreholes

Figure 105. View looking up-slope to the top of the mound from the NE side of the temple. SE facing

Figure 106. View looking up-slope to the top of the mound on the SE side of the temple. The mudbrick walls on the slope of the mound are those exposed during the excavation of Site 6. NE facing

Figure 107. The southern slope of the mound on the SE side of the temple. The mudbrick structures exposed mid-way up the mound are those exposed during the excavations of Site 6. SE facing

Other excavations of the mound were carried out between 1995 and 1996 behind the back of the northeast wall of the temple by the SCA in which the poorly preserved remains of a mummified man were found (personal communication from Kom Ombo inspectors).

To the south of the tell, during the excavations of Site 7 prior to the construction of the parking area in 2003, the SCA recovered potsherds and ostraca inscribed in demotic and Coptic (Kom Ombo Inspectorate Office 2003:1-2). No structures were located during this excavation.

During the 2015 geotechnical data collection three boreholes were drilled near the approach road to the temple site. Borehole 3 was located just outside the

boundary wall beside the western slope of the tell. Between 83.20m asl and 89.20m asl (2m to 8m below ground level) features were recorded containing burnt mudbrick, characteristic of the Old Kingdom/First Intermediate Period abandonment horizon; Kemp 1985). Below this we recorded a 3.50m thick deposit of silty clay containing charcoal indicating human activity. This would suggest that archaeological remains in this area exist some 11.50m below the current ground level.

Borehole 11 was located nearby, next to the slope of the tell beside the car park. No trace was found of any definite signs of pre-modern human activity. A 4.30m thick deposit of modern dumping was recorded, probably related to the recent development of the area, over a 6m thick deposit of silty, possibly alluvial clay. Beneath this, at 83.21m asl were natural deposits of hard clay overlying fine sand.

Zone 9

Zone 9 is located to the northwest, west and southwest of the temple. Extensive building works occurred here during the temple development program of 2002 - 2010 (Figure 108). An enclosure wall was constructed around the temple, and a lower terrace created below the upper terrace of Zone 3 (Figure 109). A disabled access ramp was installed on the southeast side leading down from this terrace and the lower terrace steps. On the northwest side of the steps a security area was created within the enclosure wall. The nilometer was incorporated within this lower terrace (Figure 110). Another, even lower terrace was created below this, accessed by another stairway and ramp from the street. The area was landscaped between here and the Nile moorings and is occupied by restaurants and bazaars (Figure 111). The banks of the Nile were also re-developed by creating three terraces to access the river bank (Figure 112). Antiquities inspectors also informed us that as part of the development program a large sand island in the Nile, not far from the Kom Ombo bank, had been removed to facilitate access by large

cruise boats. This island may have been an ephemeral sandbank as it is not shown on maps predating its removal.

Historic photographs and maps of this area show that the topography has changed considerably over the last 150 years. Map regression shows that the Nile swung to the east, severely eroding the western limits of the tell and temple prior to 1949 (Figures 113-118). Prior to 1949 the course of the Nile had moved to the west, leaving the land exposed on which the bazaars and restaurants are now located (Figure 119). A 1949 survey map shows that within this area, a drain was in use as part of the local field systems (Figure 120). The drain was recorded on Kemp's survey of 1979 although mistakenly labeled as a canal (Figure 121). Interviews in 2015 with the farmers working the surrounding fields informed us that this drain was filled in 1982 by Kom Ombo Council. As part of this work, the local council expanded the asphalt road (visitor road) over the infill and constructed a small wall of sandstone blocks at the river's edge.

As part of the 2015 geotechnical data collection a test pit was excavated within the Nilometer (TP 1) two boreholes were drilled to the west of the temple (BH 12 and 14) and a well was drilled to conduct a pumping test (well 1) just to the south of BH 14. Test Pit 1 was excavated down to 3m below ground level. We found that the southwestern part of the Nilometer was a modern reconstruction. The base of the foundation was also modern and was reached at a depth of 91 m asl. This corresponds with de Morgan's plan of the Nilometer, in which only the eastern half is visible and the western half is on the banks of the Nile, probably completely eroded away. Beneath the modern reconstruction we recorded a sequence of deposits of clay, sandy clay and sandy silt 2.00m thick containing burnt mud brick that sloped down from north to south. These deposits may have been dumped as leveling for this area, which had been severely damaged by earlier Nile action in order to reconstruct the western portion of the Nilometer.

To the west in Borehole 12 we found that the upper 3m was a modern deposit between 85.34m asl and 88.34m asl, presumably laid when this area was

developed in 2005. This sealed a deposit of silty clay at 85.34m asl to 80.34m asl, possibly an alluvial deposit, which overlay a 10.50m thick deposit of fine sand between 69.84m asl and 80.34m asl.

Borehole 14 was located to the northeast, west of the ramp that leads to the Crocodile Museum. Here, the upper 3.40m of the borehole may be modern fill. Below this, between 84.01m asl and 88.61m asl we recorded a silty clay deposit which may represent alluvial deposition. Beneath this, between 81.01m asl and 84.01m asl, we recorded a deposit of clay mixed with potsherds. Crucially therefore Borehole 14 contained human activity between 8m and 11m below the current ground level. Beneath this we recorded a deposit of silty sand, overlying 5m of fine sand.

Well 1 was located to the southeast of BH 14. Here, in Well 1, what may be modern fill formed the upper 1.35 m overlying a 5 m thick deposit of silty, possibly alluvial clay. Beneath this, between 84.78m asl and 80.78m, we recorded the same horizon that we recorded in BH 14 a four metre thick deposit of silty clay mixed with pottery fragments. The difference in levels (compare 84.01m asl and 84.78m asl) indicates a slope upwards to the south.

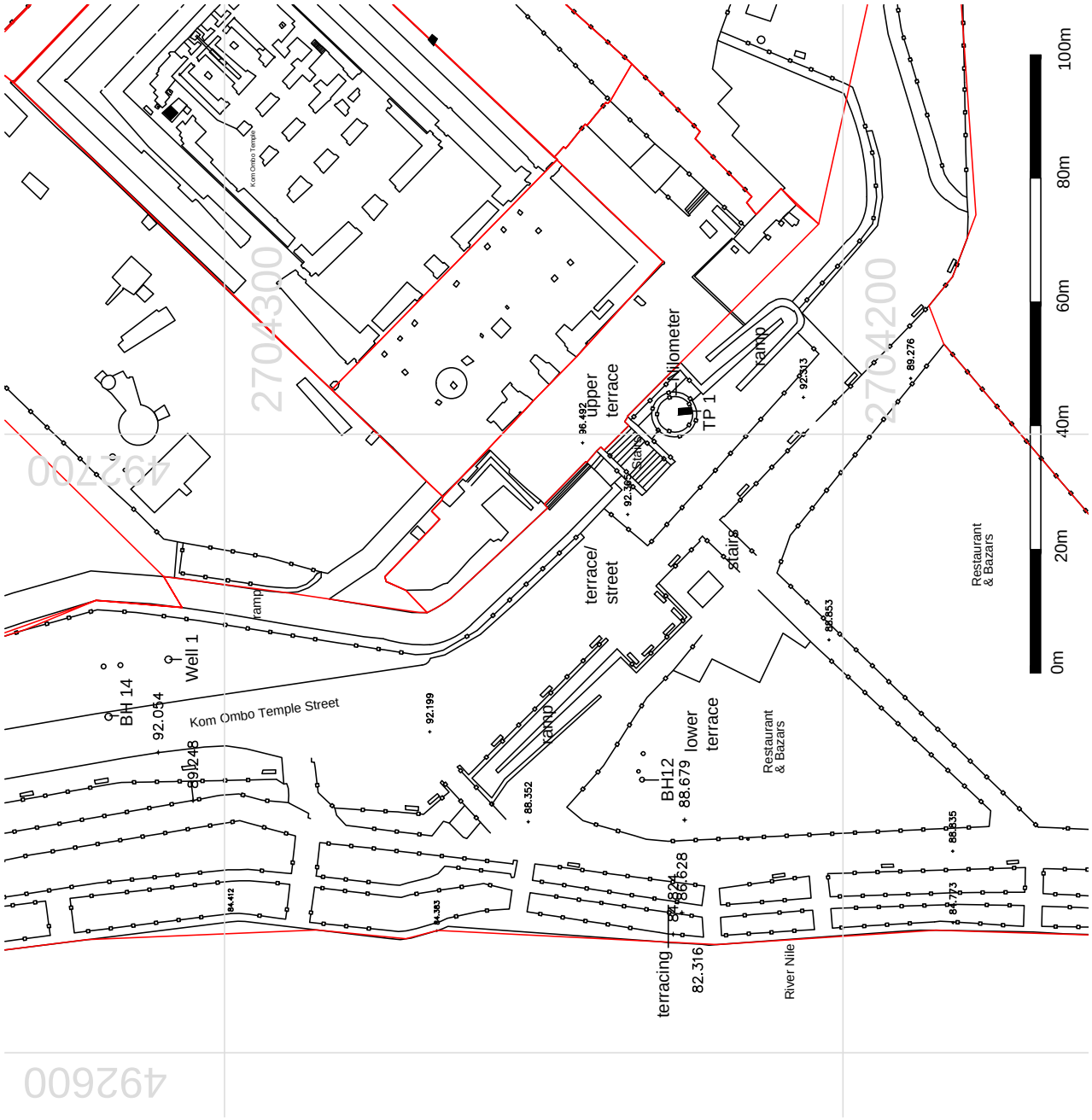


Figure 108. Plan of Zone 9 using 2015 survey data

Figure 109. View of the terrace below Zone 3 showing the stairs and ramp. NW facing

Figure 110. The Nilometer in Zone 9. NE facing

Figure 111. View of the lower terrace looking towards the central terrace and upper terrace (Zone 3). NE facing

Figure 112. Photograph of the Nile bank terraces. N facing

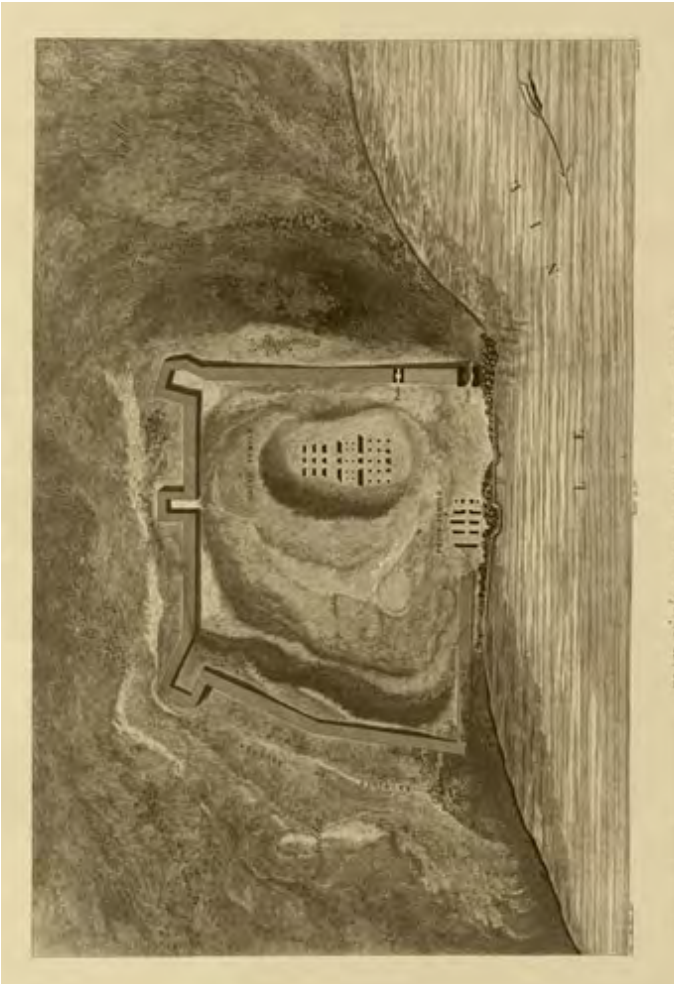


Figure 113. Plan of the ruins and environs (Description de l'Égypte 1820: Vol 1, Pl. 39)

Figure 114. Kom Ombo photographed from the north in 1857 by Francis Frith; http://collections.vam.ac.uk accessed 1 Oct. 2014. NB.1836 is not the date of the photograph.

Figure 115. Watercolour by G. de Sausmarez dated 1855.
http://collections.vam.ac.uk accessed 1 Oct. 2014

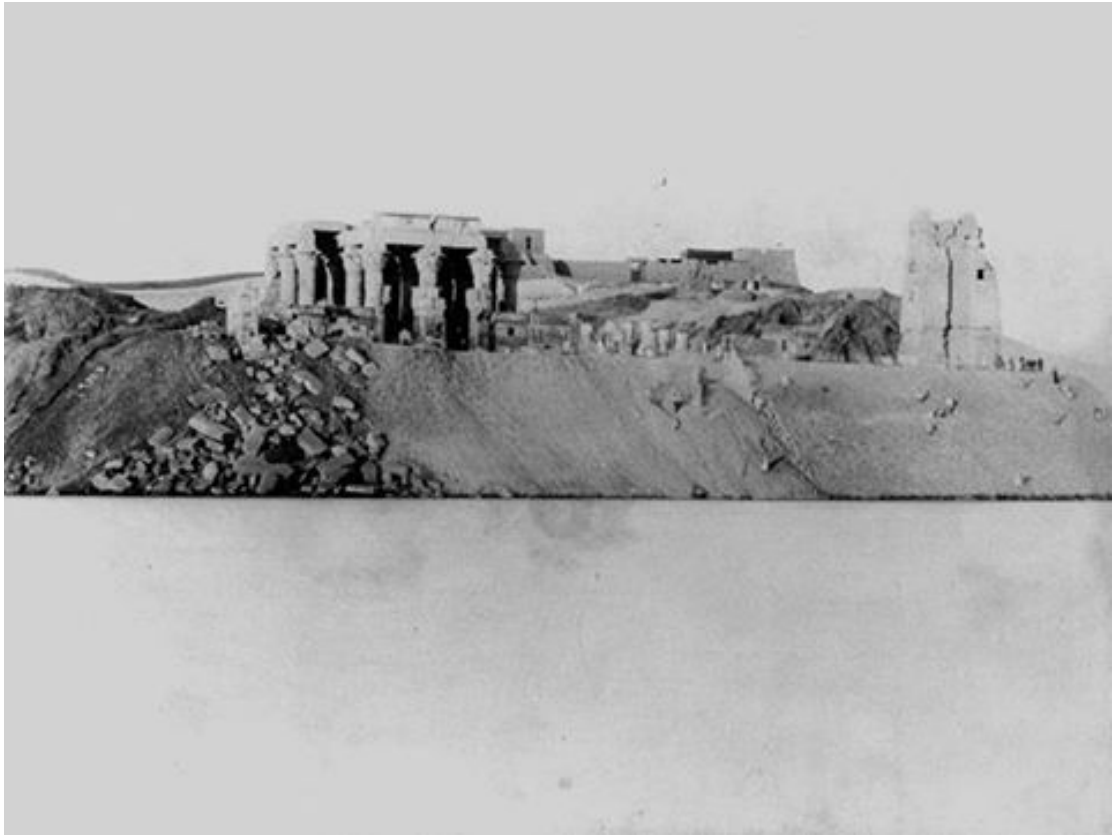


Figure 116. Kom Ombo 1895-1900, showing the side of the Mammisi tumbling down the banks of the Nile. Facing NE. Source unknown

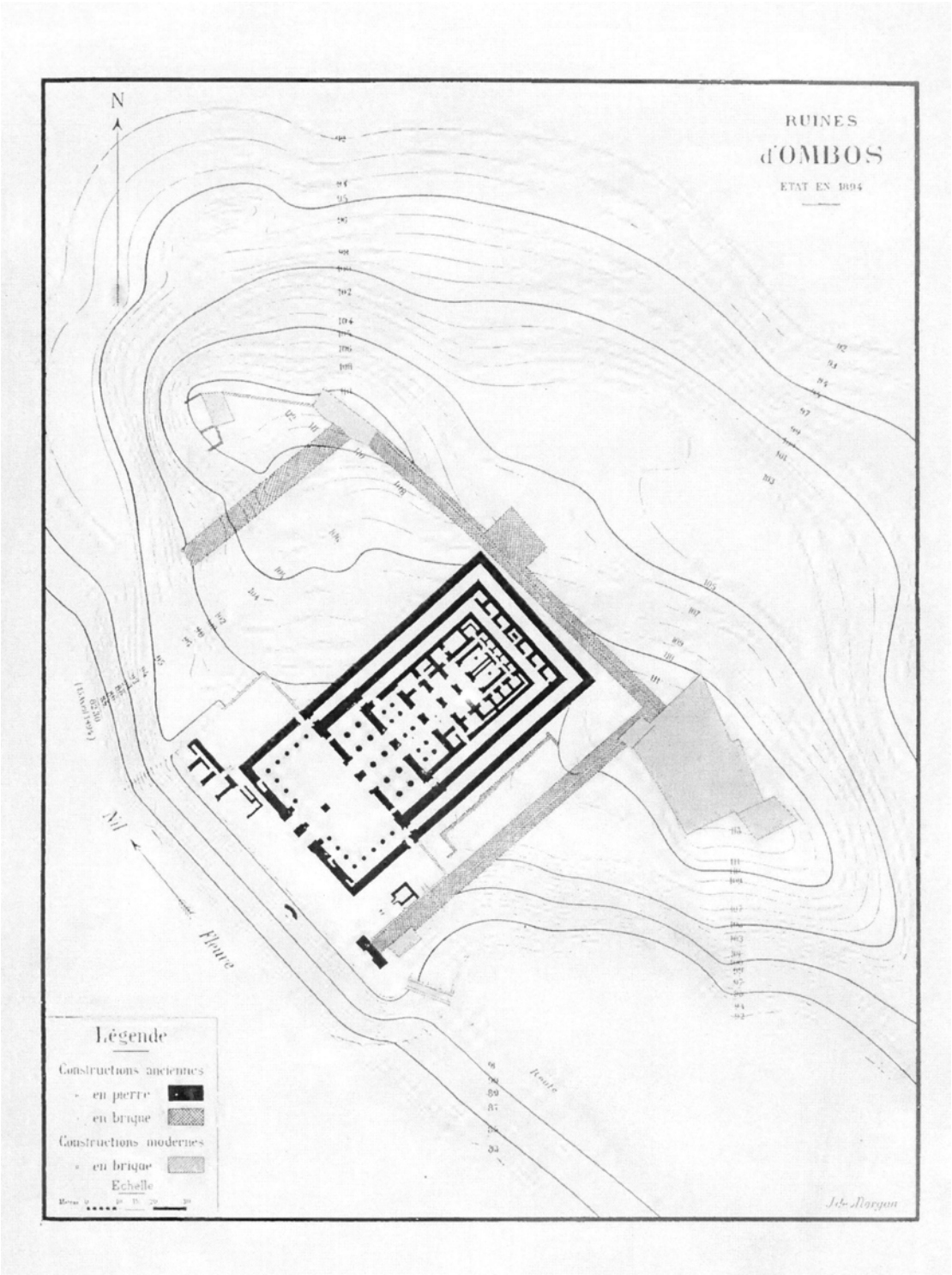


Figure 117. De Morgan's plan of the temple and tell (De Morgan 1985: frontispiece)

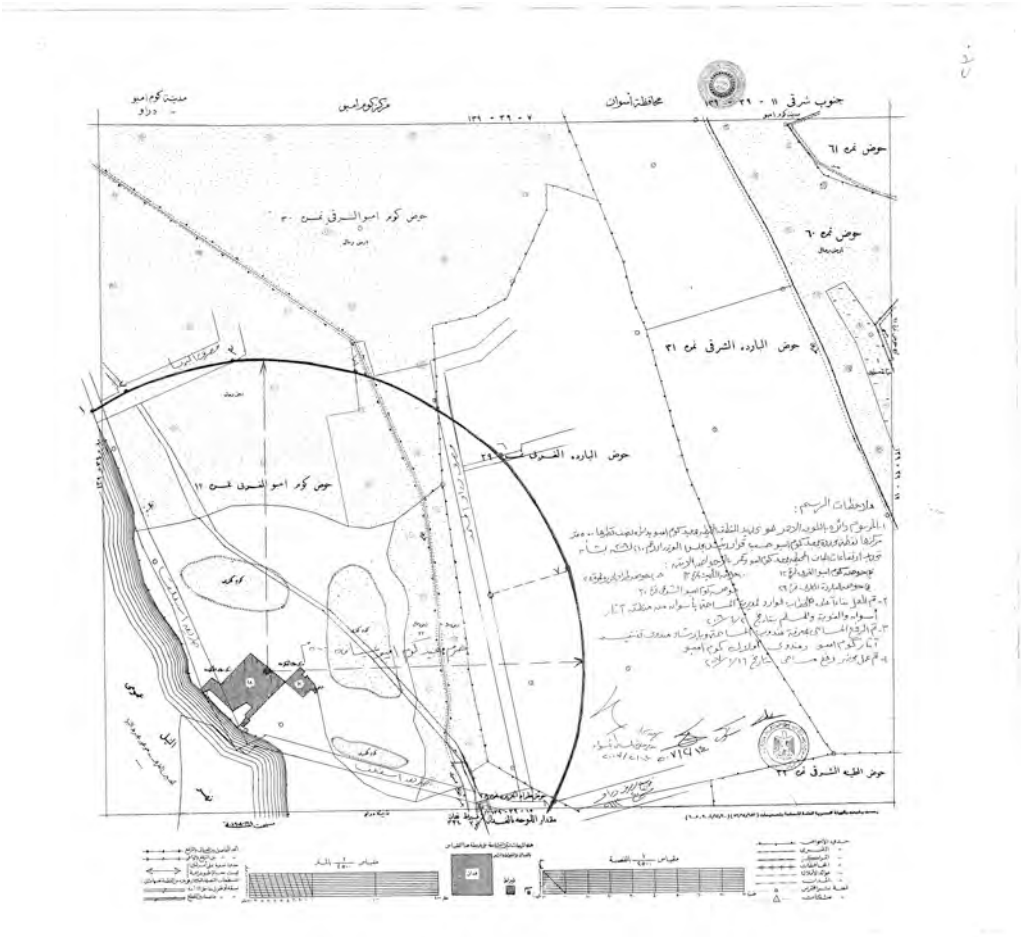


Figure 118. Survey Map, 1904. Note the steepness of the Nile bank and its proximity to the temple

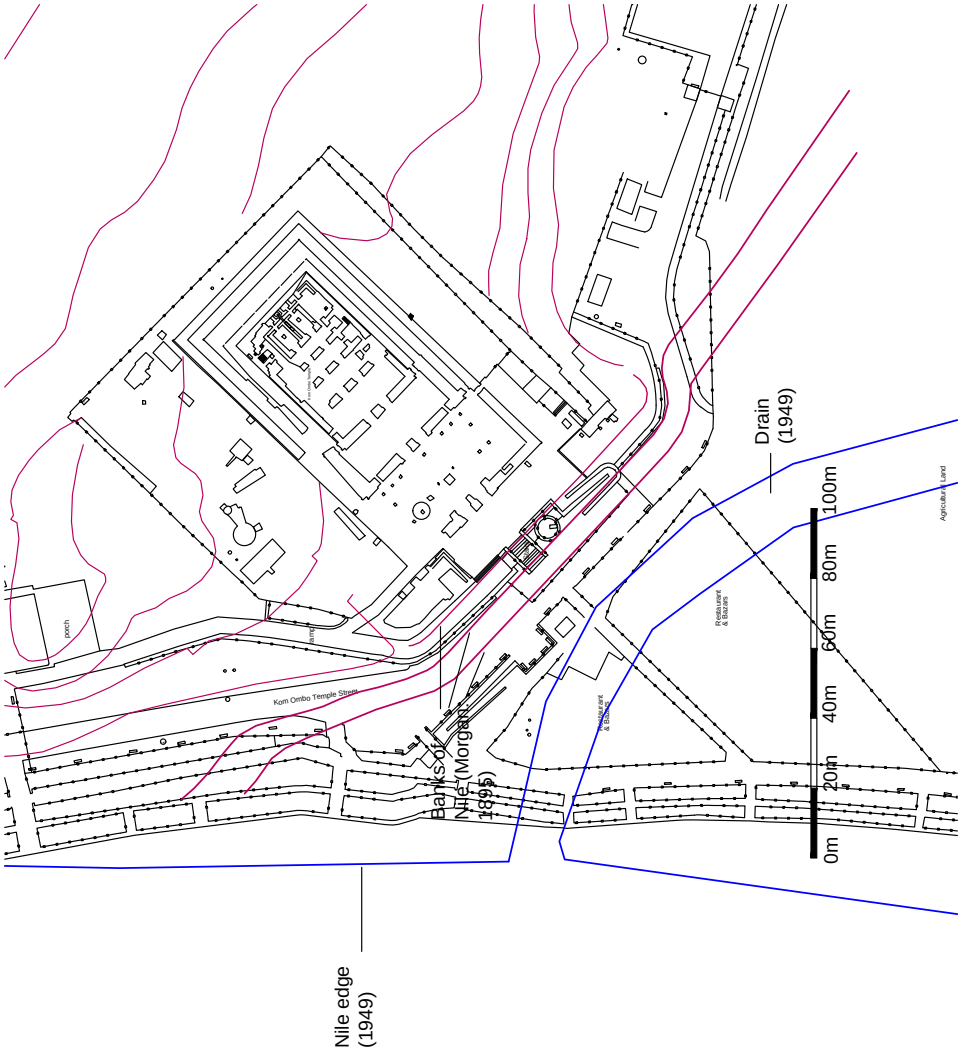


Figure 119. Plan comparing the shift of the Nile edge from 1985 (de Morgan 1895: frontispiece) and its position in 1949. These limits and the limits of the drain apparent in 1949 are overlain onto the 2015 survey data

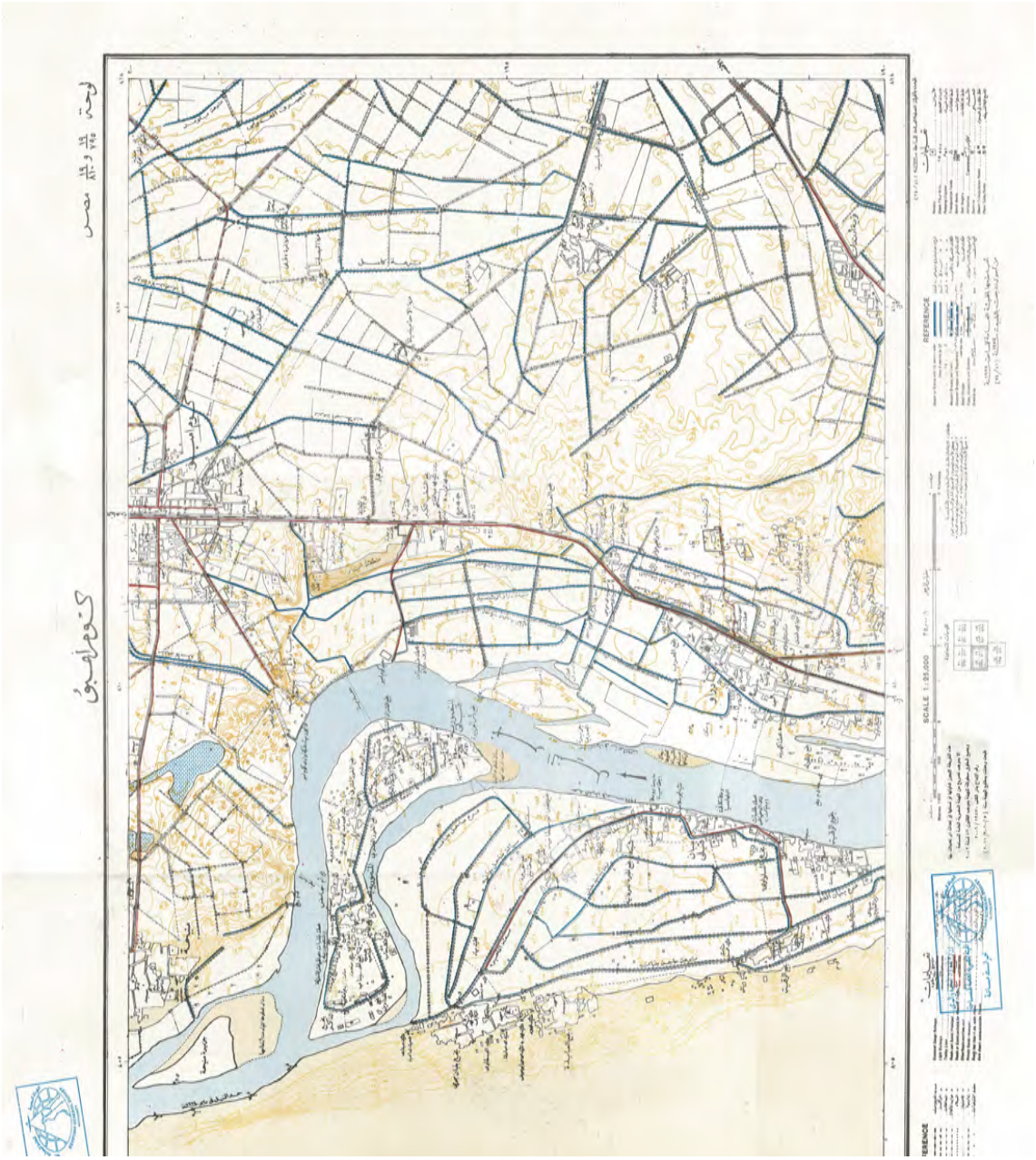


Figure 120. 1949 Survey Map

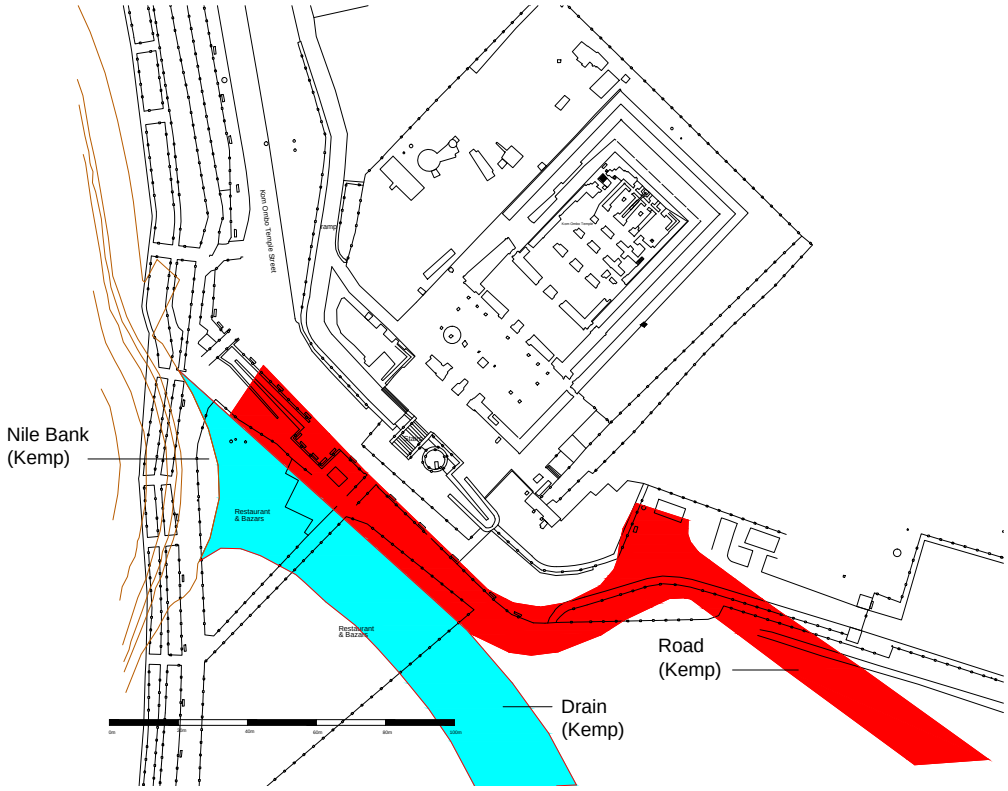


Figure 121. The positions of the canal (blue) and road (road) drawn by Kemp in 1979 (1985:fig 1) overlaid onto the 2015 survey data

6.4 Archaeological Sites within the Vicinity.

El-Shutb Necropolis

The El-Shutb cemetery is located at El-Shutb, 2 km to the south of Kom Ombo town and 0.5 km east of Kom Ombo temple (Figure 2). Excavations at the cemetery indicate that it was in use between the Middle Kingdom and Roman period. The site appears to have been a cemetery for Kom Ombo temple and the associated settlement, and contains human and animal burials. The mummified crocodiles and eggs currently displayed in the Crocodile Museum are from El-Shubt necropolis.

Prior to excavation, the houses in northern parts of el-Shutb were close to the necropolis. The tourist road connecting the main Cairo-Aswan road to Kom Ombo Temple divided the cemetery into two parts. The excavation of the southern area took place between 1965 and 1968 and the northern area between 1971 and 1991 by the SCA (Sharawi 1979:170).[6] Once the excavations had been completed, the council handed the land back to the

[6] The archive registration in the storeroom of the Kom Ombo Inspectorate logs the following: In 1968 Mustafa El Zeaary excavated in this cemetery and found pottery jars, oil lamps, crocodile eggs, tiles of faience, small copper pieces, limestone fragments, and offering tables of limestone, animal skins and bones, cartonage and remains of human and animal bones. The archive registration in the storeroom of the Kom Ombo Inspectorate logs the following: In 1968 Mustafa El Zeaary excavated in this cemetery and found pottery jars, oil lamps, crocodile eggs, tiles of faience, small copper pieces, limestone offering tables, animal skins and bones, cartonage and remains of human and animal bones; in 1972 Mustafa El Zeaary Mahmoud Abdel-Razek logged pottery from the excavation; in 1976 Sami Farag logged eyeballs, crocodile canine teeth, a coffin lid, offering tables, cartonage, a glass crocodile, a bracelet, pieces of wood, and limestone ostraca; in 1979 Mohammad Harass logged offering tables, textile flax, ostraca, and a copper ring; in 1982 Mohi El Din Mustafa logged offering tables, and limestone and ceramic jars; in 1990 and 1991 Osama Abdo El Waris logged crocodile mummies, ceramic jars and linen.

people of the village. Expansion of the village and agricultural land has now covered the site.

The cemetery covered an area of c. 42 acres and divides into the northern (164 tombs excavated) and southern (73 tombs excavated) sections. Most of the tombs were cut into the ground with mudbrick supports added wherever the soil was unstable. There was a concentration of human burials in the southern area and a concentration of crocodile burials in the northern area.

The tombs were undecorated, with no superstructure, although there were architectural changes over time. The majority of the tombs of the Greco-Roman era consisted of the entrance from above with a staircase leading down to the shaft into an antechamber which opened into the burial chamber. The doorway to the burial chamber was blocked with a mud-brick wall. The burial chamber contained one or more sarcophagi on the floor or in niches (loculi) cut into the walls in some cases. An upper level containing additional burial chambers was sometimes added above the first. The majority of the tombs had been plundered leaving behind only animal and human mummies (some sharing the same sarcophagus) and some pottery vessels.
Sharawi conducted the first excavations and recorded mummified remains enclosed in an anthropoid pottery coffin with the face and the chest of the deceased represented on the lid. Some mummies were in limetone coffins without painting and others were buried in the sand without coffins (Sharawi 1979:170-171).

In addition to human burials, the cemetery contained a large number of animal mummies. The majority of these were crocodiles of various sizes and their eggs as well as fish, dogs, hawks, parts of cattle and the head of a gazelle.[7]

[7] Information panel in the Crocodile Museum prepared for the Kom Ombo Inspectorate.

7 ARCHAEOLOGICAL POTENTIAL AND LEVEL OF SIGNIFICANCE OF HERITAGE ASSETS

Zone 1. Based on the information gathered from Zones 2-6 (see below), it is expected that Zone 1 was constructed over buried archaeological remains pertaining to a phase of the site that pre-dates the Ptolemaic/Roman temple (a phase of the site that is virtually unknown). The archaeological potential for buried archaeological remains is therefore high, and of REGIONAL, NATIONAL and INTERNATIONAL significance.

Zone 2. Aside from the KNOWN buried and standing archaeological remains within this area pertaining to the Ptolemaic/Roman temple itself, the piezometer drilled within this area showed there are archaeological horizons, down to 18m below ground level. These horizons may relate to the construction of the known temple, but it is more likely that the horizons pertain to settlement from pre-Ptolemaic/Roman periods. These are, phases of this site that are virtually unknown. The archaeological potential for buried archaeological remains is therefore high, and of REGIONAL, NATIONAL and INTERNATIONAL significance.

Zone 3. Aside from the KNOWN buried and standing archaeological remains within this area, pertaining to the Ptolemaic/Roman temple and its ancilliary structures comprising pavements, the Birth House, the South Gate and the Hathor chapel, the test pits excavated within this area identified archaeological horizons to 2.50m below ground level, including mudbrick structures at 2.50m below ground level. These horizons appear to pre-date the Ptolemaic temple (or at least the later development sequences of the temple), and may pertain to settlement predating the Ptolemaic/Roman temple, phases of this site that are virtually unknown. The archaeological potential for buried archaeological remains is therefore high, and of REGIONAL/NATIONAL significance.

Zone 4. Aside from the KNOWN buried and standing archaeological remains comprising the various standing elements in the Open Court, the test pits and piezometer drilled within the area showed that there are previously unknown, buried, archaeological remains in the form of mudbrick walls that were constructed after the known standing remains, i.e. after the construction of the Birth House and after the outer wall of the temple. The test pits showed that the known standing remains were constructed on and through a burnt horizon which may relate to a conflagration of the previous settlement. The piezometer drilled within this area also showed that there are buried archaeological remains to a depth of 7 m below the present ground level. The potential for buried archaeological remains pertaining to a phase of the site that is virtually unknown, is high, and of REGIONAL/NATIONAL significance.

Zone 5. Aside from the KNOWN buried and standing archaeological remains within this area pertaining to the Ptolemaic/Roman temple, i.e. the temple itself, the piezometer drilled in this area showed there are archaeological horizons to a depth of 6m below present ground level. These horizons may relate to the construction of the standing temple but more likely the horizons pertain to a pre-Ptolemaic/Roman settlement, phases of the site that are virtually unknown. The archaeological potential for buried archaeological remains is therefore high, and of REGIONAL/NATIONAL significance.

Zone 6. Aside from the KNOWN buried and standing archaeological remains within this area pertaining to the Ptolomaic/Roman temple (e.g the temple itself), there are KNOWN buried archaeological horizons pertaining to the tell. The surfaces of these are at 106 m asl (highest) and therefore c.9m higher than the temple floor. Therefore, within this area the tell might be expected to survive at least 9m high. The test pit that was excavated in this area showed that there is a modern foundation cut for the modern rebuilding of the temple wall. It is possible, therefore, that within this linear strip, archaeological remains have already been removed. Overall however, the archaeological potential for buried archaeological remains is high and of REGIONAL significance.

Zone 7. The southern limits of Zone 7 contain standing archaeological remains which may pre-date the construction of the Ptolemaic/Roman temple. Previous excavations have shown that buried archaeological remains survive all the way to the Antiquities Magazine. It is unclear how deep these remains are in the northern half of Zone 7. In the southern half, piezometers and boreholes drilled nearby (in Zones 4 and 9) indicate that there are buried archaeological remains to 11m below ground level. These are likely to pertain to a phase of the site that is virtually unknown (one that predates the construction of the Ptolemaic/Roman temple). The archaeological potential for buried archaeological remains is therefore high and of REGIONAL/NATIONAL significance

Zone 8. Aside from the KNOWN buried and standing archaeological remains within this area (e.g the tell), boreholes drilled besides the southwestern limits of the tell show that there are buried archaeological horizons 11.50m below ground level, to 80.70m asl. These are likely to pertain to a phase of the site that is virtually unknown predating the construction of the Ptolemaic/Roman temple. The archaeological potential for buried archaeological remains is therefore high and of REGIONAL/NATIONAL significance

Zone 9. The upper buried horizons within Zone 9 pertain to the modern re-development of the area, and alluvial deposits that relate to an earlier course of the Nile that had been much closer to the temple than is the riverbank of today. However, boreholes and the well drilled within this area show that there are buried archaeological horizons up to 11m below the present ground level. These are likely to pertain to a phase of the site that is unknown apart from the small glimpse afforded in the boreholes and which predates the construction of the Ptolemaic/Roman temple. The archaeological potential for buried archaeological remains is therefore high and of REGIONAL/NATIONAL significance

8 IMPACTS ON BURIED ARCHAEOLOGICAL DEPOSITS

8.1 Impact of Proposed Groundwater Lowering Scheme

The Groundwater Lowering Scheme has been discussed previously. The results of the desk-based assessments indicate the following likely impacts to buried archaeological remains. Figures 122, 123 and 124 show the locations of proposed trenches alongside known previous excavation areas and the locations of geotechnical investigations.

Capillary-Break Trench.

1. Around the Temple

Although the capillary-break trench will only be excavated down to the foundation level of the temple walls, the archaeological monitoring of the test pits excavated during the course of the CDM Smith's geotechnical works has shown sequences of archaeological remains to that depth in Test Pits 2, 3, 4, 8 and 10, comprising mudbrick walls (Test Pits 2 and 3), the original temple pavement (Test Pit 4) and a stone channel (Test Pit 10; Figure 122). Test pits 4 and 10 were stopped prior to reaching the foundation of the temple so it is not known what archaeological features exist beneath the stone channel (TP10) and temple pavement (TP4). Stone architecture related to the temple proper would have had to have been removed within test pits 4 and 10 in order to go deeper in the investigation. The results from Test Pit 11 indicate that a modern linear cut exists adjacent to the SE wall of the temple, presumably cut to build the modern wall here. Consequently, archaeological remains within this area may already have been removed.

The results from Test Pit 2 show a large mudbrick wall with an upper elevation of 82.83 m asl that is older than the northeastern wall of the Birth House. Because the foundations of the birth house cut through this wall, the earlier mudbrick wall is at a higher level than the foundation of the birth house. Since the temple foundations cut into earlier laid archaeological remains there is the potential for archaeological remains that pre-date the construction and use of the temple. **Within this area there are known archaeological remains.**

2. Within the forecourt

A test pit initially begun in the forecourt immediately encountered the original temple pavement; the excavation of this test pit was therefore halted. Wherever the trenches are proposed within this area, cuttings would need to be made through the original pavement. **Within this area there are known archaeological remains.**

3. The northern court

Test Pits 6 and 7 were excavated within this area. In Test Pit 7 it was clear that the Crocodile Basin is constructed on a burnt red brick 'powder', similar to the horizon identified a little to the NW by Kemp in 1979 which he interpreted as traces of Old Kingdom/First Intermediate Period settlement and related to a possible fire (see below). **Within this area there are known archaeological remains**.

Groundwater Collection Pipes, Manholes and Relief Wells

4. Eastern line of pipe

The contour lines of the Kom Ombo tell as drawn by de Morgan in 1894 prior to tell clearances by the sebakhin and the Antiquities Service in the early 20th century show the limits of the tell exceeding their present boundaries as visible above the modern ground level. The eastern and northern collection pipes are along the limits of the drawn contours and within the tell. Although the eastern limits of the tell have been heavily cut away by the Sebakheen it is highly possible that archaeological features still survive within this area (Figure 123). **Within this area there is a high potential for archaeological remains.**

5. Northern line of pipe

Figure 123 shows excavated or recorded archaeological remains (Sites 3, 4 and 5) near the path of the proposed collection pipe. These sites were excavated and recorded after the Tell in this area had been lowered to the current ground level and just a little above current ground level.

Site 5 is an area of mudbrick walls and associated deposits that are currently visible and Site 4 is an area where the remains of a large mudbrick wall were seen and part of a stelae dated to Amenhotep II was recovered. Site 3 is an area where a number of alluvial layers were recorded as well as an undated skeleton of an infant (estimated 3-5 years old). Figure 123 also shows the patches mapped by Kemp that comprise burnt earth and burnt mudbrick walls recorded at a lower level than the temple floor. Based on the associated pottery scatter Kemp provisionally dated the walls and the 'burnt horizon' to the Old Kingdom/First Intermediary Period. Although the line of the trench avoids Sites 4 and 5, it is possible that the types of remains previously recorded and encountered in the test pits here extend further to the north. **Within this area there is a high potential for archaeological remains.**

6. Western Line of Pipe

Part of this route crosses the original tell mound and part of this route crosses an area previously within the bank of the Nile (Figure 124). Historic photos from the 19th and 20th centuries clearly show the Nile reaching the front of the temple. It is therefore expected that upper archaeological remains have been destroyed by the Nile and by the sebakhin. Furthermore, Kemp's map of 1979 shows the line of a canal flowing exactly along the western line of the proposed pipe. However, the data from Borehole 14 and Well 1 show that there are buried archaeological horizons up to 11m below ground level, below the horizon of these modern activities. These deep deposits are likely to belong to a phase of the site that is virtually unknown (one that predates the construction of the Ptolomaic/Roman temple).

Within this is area there is a high potential for archaeological remains.

7. Southern Line of Pipe

Part of this route follows the line of the modern road and then turns to the NE to meet the eastern modern road. Excavations in the car park, prior to its construction, pottery sherds and ostraca with inscribed in demotic and Coptic were recovered. Borehole 3 encountered what may be a 10m deep

archaeological sequence. Borehole 4 encountered a c. 4,30 m deep deposit of sand at the surface, overlying a 6 m deep deposit of silty clay, over alluvial deposits. **There is a moderate to high potential for archaeological remains in this area.**

Discharge Force Main

In reducing impacts to potential archaeological remains, Alternative 2 is the most desirable option. **Here there is a low potential for archaeological remains.**

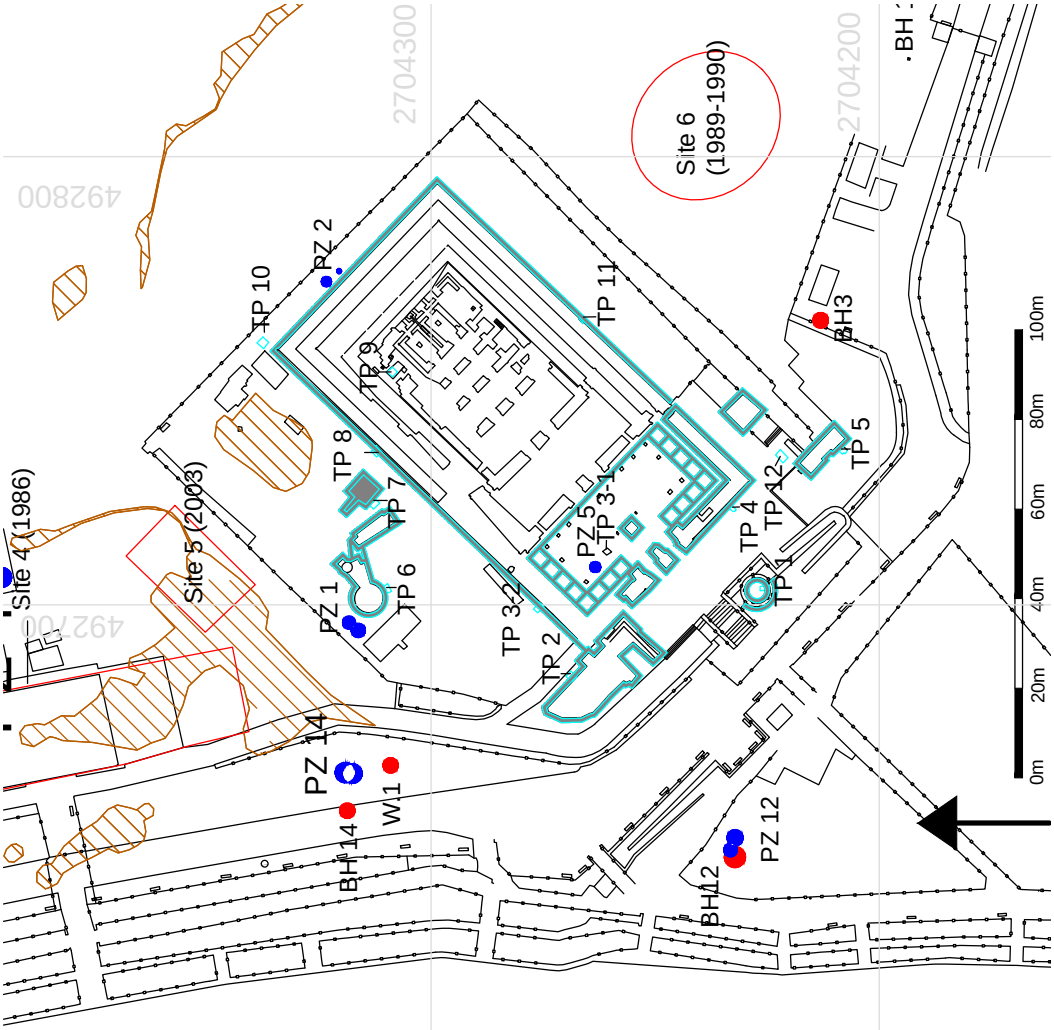


Figure 122. The lines of the proposed Capillary-Break Trenches and the locations of test pits, boreholes, and areas of reddened earth recorded by Kemp. Map produced using CDM Smith survey data

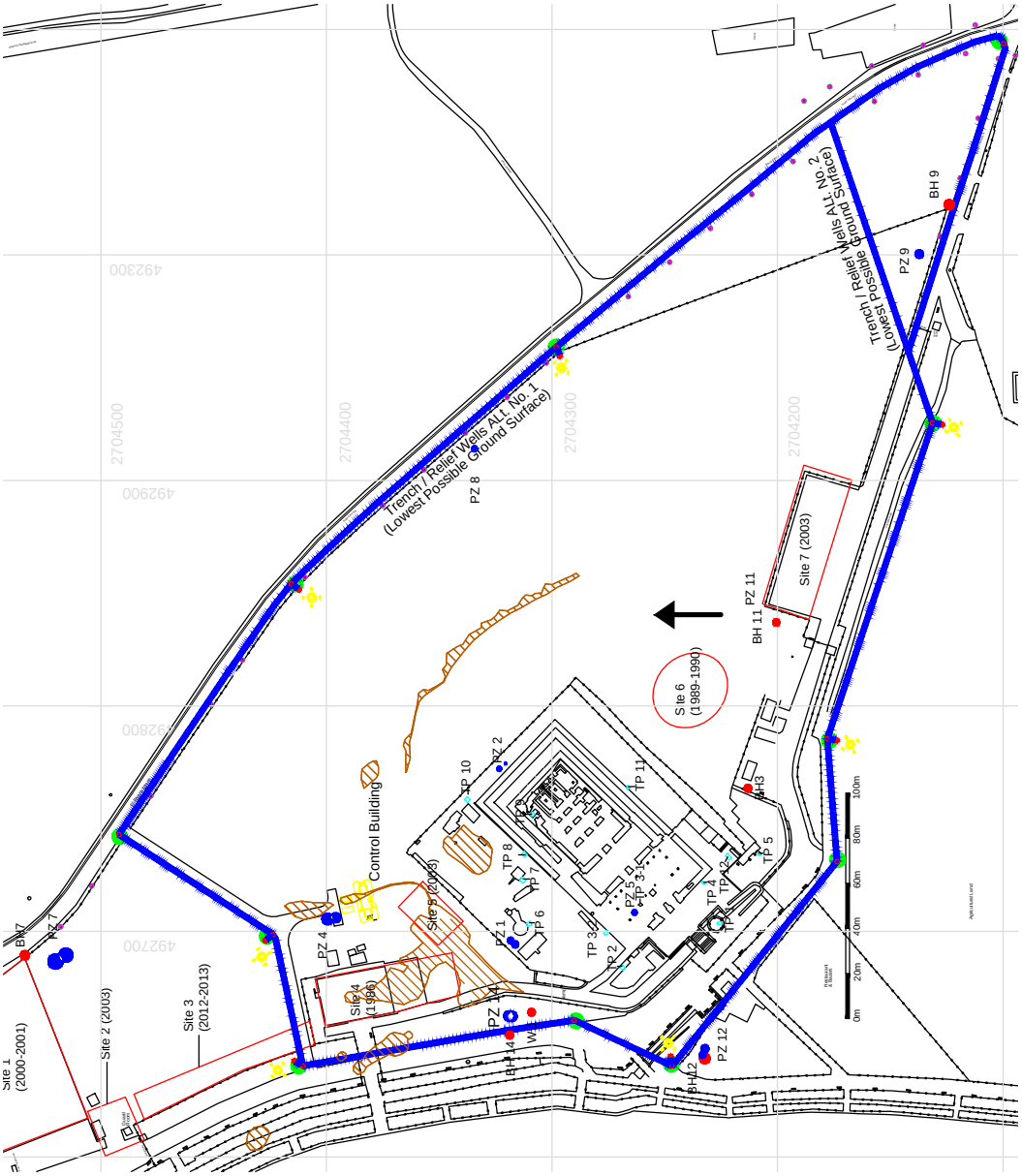


Figure 123. The proposed Groundwater Collection Pipes, Manholes and Relief Wells, and the locations of test pits, boreholes, known previously excavated sites and areas of reddened earth recorded by Kemp. Map produced using CDM Smith survey data

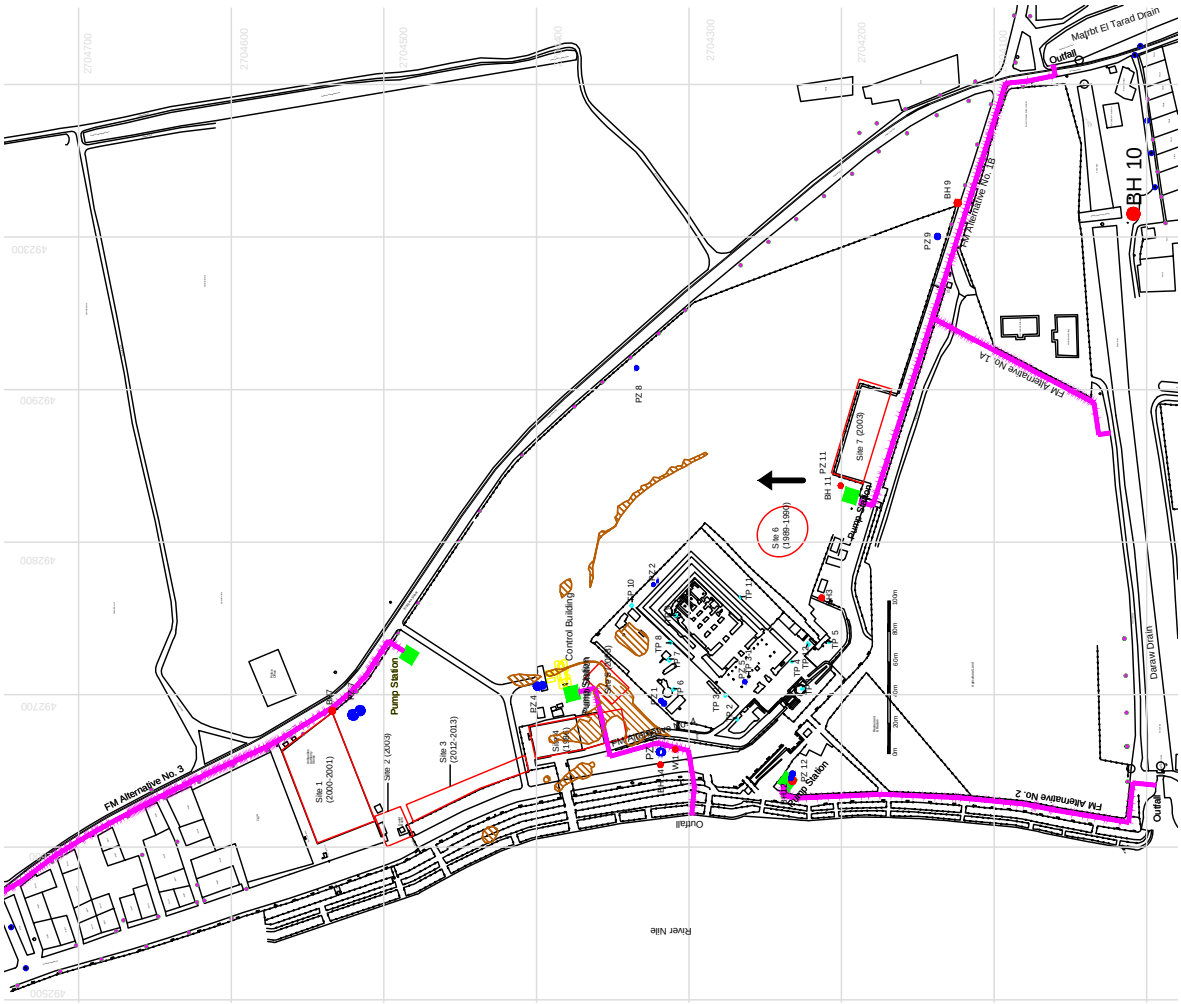


Figure 124. The proposed Discharge Force Main and pump stations (5 variations) and the locations of test pits, boreholes, known previously excavated sites, and areas of reddened earth recorded by Kemp. Map produced using CDM Smith survey data

9 MITIGATION

Where archaeological features, as identified by the Desk-based study, are likely to be encountered, strategies should be developed to deal with them. This may include preservation in situ, by removing any impact to a heritage asset, or by 'preservation by record'. 'Preservation by record' requires best-practice excavation and recording of all archaeological remains that are to be impacted. The results of those excavations should be published, and this should form part of the overall project design.

The archaeological remains at Kom Ombo are of International, National, Regional and Local significance. ARCE recommends that archaeologists (with firm backgrounds in commercial archaeology environments) are present at ALL times during the engineering works. ARCE recommends that all ground penetrating works, where archaeological remains are encountered, be excavated by hand, by experienced archaeologists. The archaeological remains should be recorded using best-practice methods and the results of these excavations should be published in an appropriate journal.

In areas where there are no known archaeological remains yet the potential for archaeological remains is considered to be low to high there may some value in conducting field evaluations. The objectives of these would be to determine, as far as is reasonably possible, the location, extent, date, character, condition, significance and quality of any surviving archaeological remains liable to be threatened by the current engineering design. An adequate representative sample of all areas where archaeological remains are potentially threatened should be studied, and attention should be given remains of all periods (including evidence of past environments).

In areas where no archaeological remains are encountered and trenches are therefore excavated using a mechanical digger, an archaeologist should

always be present during their excavation, monitoring the trenches for the presence of archaeological features.

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11 ACKNOWLEDGEMENTS

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This Desk Based Assessment could not been achieved without the financial support of the United States Agency for International Development. It is a pleasure to acknowledge here the very fruitful collaboration between the archaeological team and CDM Smith engineers, especially Thomas Nichols whose awareness of the importance of professional archaeological participation at every level of this project has resulted in an exemplary result.

12 APPENDIX 1. REVISED TECHNICAL PROPOSAL, ARCHAEOLOGICAL ASSISTANCE FOR THE GROUNDWATER LOWERING PROJECT AT KOM AL-SHUQAFA (ALEXANDRIA) AND KOM OMBO TEMPLE

The objective of the proposed small grant to ARCE is to provide expert archaeological advice throughout the design of groundwater lowering (GWL) systems for two archaeological sites in Egypt, namely Kom Ombo, in Aswan Governorate and the Catacombs of Kom al-Shuqafa in Alexandria Governorate. The scope of this grant entails ARCE working closely with the engineering firm designated by USAID to implement the GWL project, in coordination with the Ministry of Antiquities (MoA), and USAID to ensure that archaeological elements are seriously considered during the early phase of designing GWL systems at both sites.

This technical proposal is divided into three tasks

Task 1: Data collection for desk-based assessments

Task 2: Onsite monitoring of site investigations and participation in review of the proposed design

Task 3: Reporting

It is anticipated that many components essential for both tasks will occur simultaneously. The aim is to provide the designing engineers, CDM Smith, with archaeological information necessary to design efficient groundwater lowering engineering works at the above-mentioned sites. Information derived from these two tasks will be provided to CDM Smith on a frequent and regular basis or as required. The archaeological support teams will coordinate their activities with CDM Smith's projected time-line and will adjust their activities to comply with any changes as needed.

During the implementation of both tasks there will be regular coordination meetings with the Ministry of Antiquities inspectorates and with CDM Smith to assist in the design of a model for the groundwater lowering project.

Task 1: Data collection for desk-based assessments (DBAs)

Definition

A desk-based assessment is a program of study of the historic environment within a specified area or site that addresses agreed research and/or conservation objectives. In this case, the objectives are those defined by the groundwater lowering projects. A DBA consists of an analysis of existing written, graphic, photographic and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the study area. It should include appropriate consideration of the settings of heritage assets as well as the nature, extent and quality of the known or potential archaeological, historic, architectural and artistic interest. Significance is to be judged in a local, regional, national or international context as appropriate. The scale and scope will be determined by the needs of the groundwater lowering project.

The desk-based assessment and site assistance will be carried out according to internationally accepted standards and guidelines as described on the website of the Institute of Field Archaeologists
at: http://www.archaeologists.net/sites/default/files/node-files/DBA2012.pdf
and http://www.archaeologists.net/sites/default/files/node-files/IfASG-Field-Evaluation.pdf

These desk-based assessments for the two sites will take into account the particular conditions present in Egypt and in particular at these sites together with the needs of the proposed groundwater lowering projects as expressed by CDM Smith which are aimed at safeguarding archaeological heritage at the two above-mentioned sites from erosion and effects of harmful man-made interventions which might threaten the historic environment. It will be kept in mind throughout that the emphasis must be on relating findings in archival

and published sources with actual site conditions since the purpose is to advise in the design of the engineering projects, not to undertake extensive research beyond this brief.

The assessments will attempt to determine the extent of both these aspects of the project areas and how they may be impacted by the proposed groundwater lowering works or how impacts may be mitigated. The assessments will be non-intrusive at the sites, meaning they will not include test trenching or geophysical work.

Purpose

The purpose of a desk-based assessment is to gain an understanding of the historic environment in a given locality. In the present context it is to formulate the following:

1. The identity and range of cultural heritage assets known to survive within the area of study.
2. An assessment of the significance of the known or predicted heritage assets considering their archaeological, historic, architectural and artistic value and interest.
3. Strategies for further evaluation whether or not intrusive, where the nature, extent or significance of the heritage is not sufficiently well defined.
4. An assessment of the impact of the proposed development (groundwater lowering) project or other land use changes on the condition and significance of the heritage assets and their settings.
5. Strategies to conserve the significance of heritage assets, and their settings, including avoidance by potentially destructive interventions.
6. Strategies to ensure new developments make a positive contribution to the character and local distinctiveness of the historic environment and future local place shaping (site management developments).
7. Proposals and/or recommendations for further archaeological investigation within a structured program aimed at safeguarding the heritage assets in the study area. This is most likely to be during any implementation of engineering works.

Methodology

Task 1 (Data collection) will occur over a period of six to eight months (see CDM time schedule). This will include data collected from offsite sources as well as from onsite investigations. Geotechnical data obtained from site evaluations will provide information needed to augment findings of the desk-based assessments for adequate advice in designing the engineering works. Monitoring and recording on site by the archaeologists will be part of the archaeological component contributing to the design of the groundwater lowering engineering works.

Data collected from offsite and onsite investigations will be compiled by two teams, each comprised of two qualified Egyptian archaeologists working at each location simultaneously. Both teams will be supervised by Ms. Freya Sadarangani, a British archaeologist who has extensive experience working in Egypt. Ms. Sadarangani has worked with the ARCE/AERA Archaeological Field School and is well acquainted with the inspectors who will conduct the assessments and on site monitoring. The Egyptian archaeologists are all graduates of the ARCE Field Schools.

Offsite data can be obtained from various resources in a number of different locations for evaluating the archaeological and heritage assets at the two sites included in this proposal. These will include, but may not be limited to, the following:

- Libraries: in Cairo at the American Research Center in Egypt, the German Archaeological Institute, the French Archaeological Institute and the American University in Cairo. In Alexandria at the Italian Cultural Center, Alexandria Archaeological Society and the Bibliotheca Alexandrina.
- Various photographic and project archives of the archaeological institutes listed above.
- On-line web-based resources especially photographic archives of nineteenth and early twentieth century photographs. Internet sources will be especially valuable for historic imagery.

- Historic maps, plans, paintings, drawings and photographs.
- Ministry of Antiquities and Heritage archives comprising inspectors' reports and photographic repositories such as those in the Documentation Centre (Zamalek), the Comité de conservation des monuments de l'art arabe archives in the Citadel (Cairo) or materials kept at local inspectorates.
- Documentation of any previous engineering interventions at the sites.
- Personal archives of colleagues.
- The sites themselves.

Task 2: Monitoring of on-site investigations (archaeological field evaluation) and participation in review of the proposed design

On site investigation comprising sub-surface borings and non-invasive methods such as magnetometry and ground penetrating radar will provide important information about buried archaeology and the nature of natural and man-made contents of the ground.

Monitoring and recording on site by the archaeologists will be part of the pre-construction archaeological component contributing to the design of the groundwater lowering engineering works. The timetable will have to remain flexible. Based on previous experience, unforeseen scheduling difficulties may arise during this work. The engineers will determine the schedule and the archaeologists will follow this schedule.

Task 2 (Monitoring of onsite investigations) is anticipated to take six to eight months, depending on CDM's onsite work, which will run concurrently with Task 1. On-site monitoring work and revision of assessment reports will be conducted by two teams, each comprised of two Egyptian Ministry of Antiquities (MoA) inspectors working at each location simultaneously. Both teams will be supervised by Freya Sadarangani.

A proposed timeline follows on page 5, based on the tasks required to carry out the scope of work. The archaeologists will follow the schedule determined by the engineers.

Definition

The definition of archaeological field evaluation is a limited program of non-intrusive and/or intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits and artifacts, or environmental factors affecting these, within a specified area or site. When such archaeological remains are present field evaluation defines their character, extent, quality and preservation, and enables an assessment of their worth in a local, regional, national or international context as appropriate.

Purpose

In the context of these proposed works at Kom Ombo and Kom al-Shuqafa, no archaeological fieldwork will be undertaken by ARCE or its representatives. ARCE will undertake to monitor, where appropriate, and evaluate information from sub-surface geophysical investigations retrieved by others under separate contract.

The information provided by these samples will be of the highest importance for determining the sub-surface archaeological conditions at each site and relating these to those visible on the surface. They will be of assistance in formulating appropriate designs for implementation of the proposed groundwater works in ways that will mitigate harm to the buried archaeology where possible and allow appropriate measures to be put in place to deal professionally with any archaeological discoveries made during implementation.

Task 3: Reporting

In order to support the pre-design and design stages of the Groundwater Lowering project, information collected by the archaeological team will be conveyed frequently to CDM Smith as required. This will be in the form of verbal communications and brief written interim reports.

1. The archaeological teams will send brief reports of data collected on a weekly or ‘as needed’ basis to CDM Smith and Ms. Sadarangani. The aim of these reports is to inform the engineering firm of present archaeological conditions at the sites supplemented with professional recommendations based on such knowledge as might be available. The contents of the reports will be limited to information that will help design dewatering projects with minimal impact on the archaeological integrity of the sites.

2. Ms. Sadarangani will submit monthly progress reports to ARCE for review by the ARCE Associate Director (Michael Jones), who will then forward them to the Engineering firm and USAID. The contents of the reports will vary according to the scope available for each site. This will only become clear once the work on collecting data has begun and the complexity or otherwise of the information available from existing sources determined.

3. A final report illustrated with photographs, drawings, maps and plans will be provided at the conclusion of the desk based assessments and site investigations. It will contain the following:
   - ❖A non-technical summary.
   - ❖Table of contents.
   - ❖Acknowledgements.
   - ❖A description of the heritage assets and archaeological potential of the study area.
   - ❖A statement of research and/or conservation objectives and how they have been addressed by the study. The groundwater lowering is understood as a conservation measure in this context.
   - ❖A clear map of the study area.
   - ❖The aims and purpose of the assessment.
   - ❖Identification of existing heritage or archaeological site management plans that may be in operation in the locality, and where sufficient information about the proposed development (groundwater lowering project) is available.
   - ❖An assessment of the impacts that new development may have.

- ❖An assessment of the interest and significance of each asset and its setting, focusing on those aspects which will be affected by any proposed or predicted changes.
- ❖An assessment of the nature of the effects and options for reducing or mitigating harm. Opportunities for positive effects will be identified as well as negative impacts and mitigation options.
- ❖A description of the area's historic character and the effect of the proposed development projects upon it (where appropriate, this should include options for conserving or enhancing local character).
- ❖Conclusion.
- ❖ Supporting illustrations at appropriate scales; supporting data, tabulated or in appendices; list of resources accessed and their locations.
- ❖ Index.

Proposed Timeline:

		Months of implementation									
Task #	**Description**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	
1	Data collection for desk-based assessments (onsite & offsite)										
	Kom Al-Shuqafa							*			
	Kom Ombo							*			
2	Monitoring of onsite investigations and coordination meetings										
	Kom Al-Shuqafa							*			
	Kom Ombo									*	
3	Final report preparation and										

	administrative closeout										

- Tasks 1 and 2 may run beyond six months depending on whether CDM's onsite investigation activities are delayed at either of the two sites.

13 APPENDIX 2. SUMMARY OF GEOPHYSICAL SURVEY REPORT

In March 2015 a geophysical survey of the Kom Ombo area was commissioned by CDM Smith. DC-Resistivity Sounding and multi-frequency very low frequency-electromagnetic measurements were used (Helal Group for Geotechnical- Geological-Geophysical Services 2015). Figure 1 shows the location of the very low frequency electromagnetic measurements (VLF-EM) profile locations.

The data in the report have yet to be interpreted in an archaeological context. This appendix provides a summary of the findings based on the English translation of the Geophysical Survey Report. It is clear that a considerable buried archaeological landscape was encountered in the course of this geophysical survey and documented in the report.

Unsurprisingly the profiles within the tell (2, 4, 5 and 21) showed anomalies that may indicate the presence of mudbrick walls. Profiles 2, 4, 5 and 7 indicate what may be walls within the upper c. 2.50 m. Profile 6 indicates that from ground level to c.7.50m below ground level there are mudbrick walls present. Profile 17 and Profile 18 (at the eastern end) indicate that from ground level to c. 5 m below ground level there are mudbrick walls present.

And at the end of Profile 21 mudbrick was indicated in the upper c. 5.00 m. To the southwest of the temple, within profiles 11, 12, 13, 14 and 15, the upper horizons appeared to be dominated by silty clay (alluvium).

The profiles within the temple indicate stone in the upper horizons representing the foundations of the temple to c. 2.50m below ground level. At the southwestern ends of Profiles 24 and 25 the presence of stone is indicated but mainly concentrations were picked up within the temple proper. Stone was picked up within the mid points and end points of Profile 22.

Within Profiles 28 and 29 the outer wall of the temple was picked up as an anomaly, together with what may be a foundation cut for the wall on its southeastern side (Figure 2). To the northeast, within Profile 20, stone was

indicated midway along the profile, possibly associated with the basins and wells within this area (Figure 2).

Figure 1. the location of the very low frequency-electromagnetic measurements (VLF-EM) profile locations

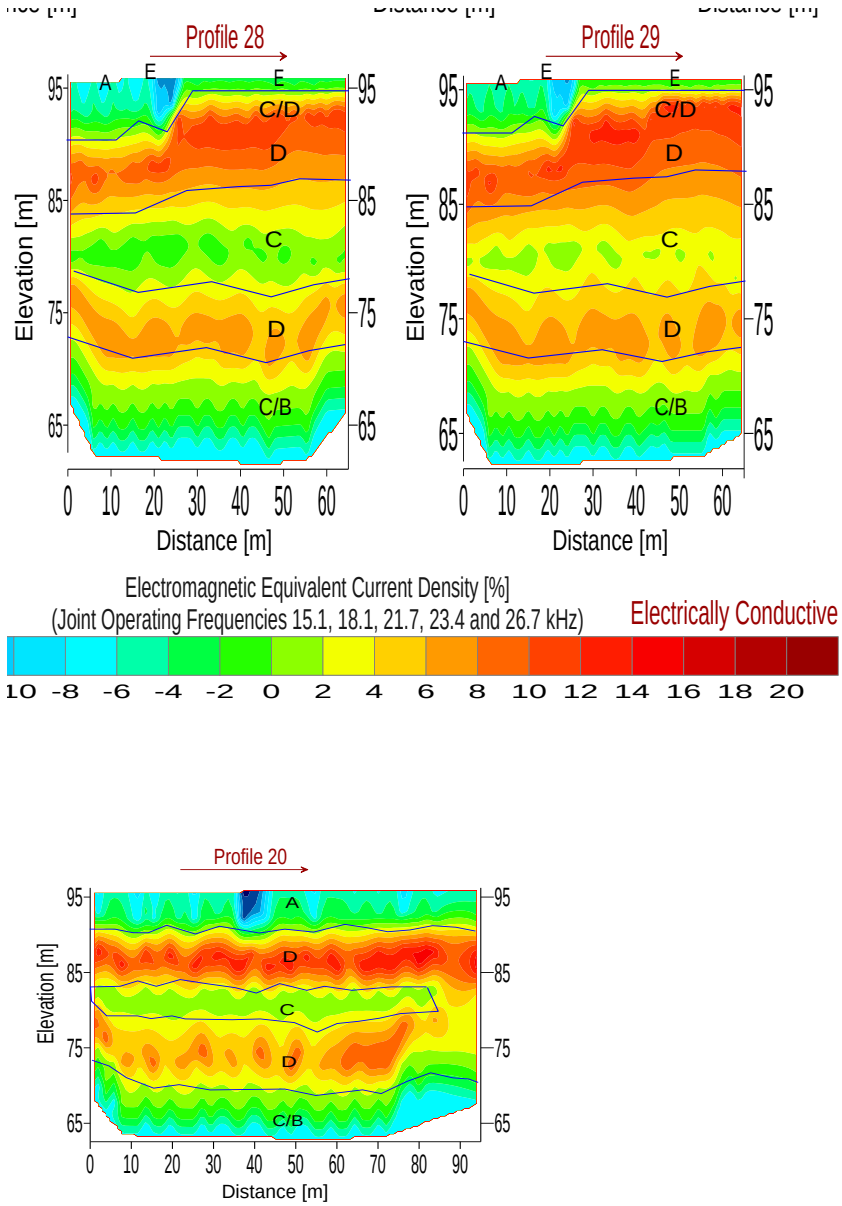


Figure 2. Profiles 20, 28 and 29

Summary of Geophysical Survey Report

In 2010 the National Research Institute of Astronomy and Geophysics (NRIAG) collaborated with the Supreme Council of Antiquities to conduct a comprehensive geophysical field survey of the Kom Ombo temple, the immediate surroundings (including the main entrance and the area of the Crocodile Museum) and part of the tell. INRIAG produced a report in Arabic which was translated into English by the Helal Group for Geotechnical – Geological – Geophysical Services in 2015. The objectives of the survey were 'to study and follow up the negative (destructive) human and environmental impacts on the temple site from the polluted subterraneous/ground water level rise and invasion from the vicinity area due to the lateral urban sprawl and increasing cultivation activities' (page 6 of translation).

The Geophysical Survey used Geo-Radar Field Measurements, Geo-Electric Field Measurements and Shallow Seismic Refraction Field Measurements. The interpretation of the data collected is described below.

Geo-Radar Field Measurements

The survey used a shield antenna of (central) 270 MHz operating frequency to record 392 longitudinal traverses (profiles), 1 m apart (NRAIG 2010: ch1-1). This survey was suitable for imaging near surface anomalies associated with buried archaeological features.

The survey also used shielded antennas of (central) 200 and unshielded antennas of (central) 80, 40, and 35 MHz operating frequency (NRAIG 2010: ch1-2 to 5). These recorded 149, 48, 6 and 8 profiles respectively in order to image subsurface anomalies associated with soil/rock characterization and groundwater conditions.

Separate spatial zones within the survey area were coded A through to H, with Area A being the area directly in front of the south gate, Area B being the area in front of the forecourt, C the temple proper, D the Open Court, E and F

in front of the entrance, G the area around the Crocodile Museum, and H on the Tell, to the east of the Parking area.

Within Area A, linear anomalies were recorded with the 270 MHz operating frequency. There were interpreted as electrical cables (p.19 of translated report). In Area B linear anomalies were picked up, with the 270 MHz operating frequency, interpreted as electrical cables or past-human activities. Restoration work was interpreted at between 0.80m and 1.60m deep (p.19). in Area C linear anomalies were interpreted, with the 270 MHz operating frequency, as temple lighting or 'past human activities (archaeological structures, restoration works or olden (sic) temple subsurface extension indications)'. (p.20 translated). The profiles included in the report seem to indicate a downward west to east slope beneath the temple, between 1m and 7m below ground level (within the Hypostyle Hall). Surface anomalies were also picked up between c. 2.20m and c. 5m below ground level in the two areas to the east (prof. 122 and 131).

Within Area D linear anomalies were recorded, with the 270 MHz operating frequency, interpreted as electrical cables OR 'past human activities (archaeological structures and restoration works indications. Backfill thickness is almost clear and followed by a relatively saturated bedrock/soil' (p.20 translated).

Within Areas E and F linear anomalies, with the 270 MHz operating frequency, were interpreted as electrical cable 'OR backfill thickness (finishing floor (stony) layers over olden backfilling, vertically-jointed in some places) followed by a relatively saturated-bedrock/soil' (p. 20 translated).

Within Area G linear anomalies, with the 270 MHz operating frequency, were interpreted as electrical cables 'OR metal fence effects (are clear as X-shaped reflections along Profile 292) or backfill thickness (finishing-floor (stony) layers over olden backfilling, vertically jointed in some places) followed by a relatively saturated bedrock/soil' (p.20 translated).

In Area H linear anomalies, with the 270 MHz operating frequency, were interpreted as ‘archaeological structures and (parts of) mudbrick walls OR near-by topographical effects’ (p.20 translated).

The interpretation of the data collected using the 200MHz measuring antenna was divided into Area A (area inside he temple), Area B (the area surrounding the temple – particularly the Open Court), and Area C (the area around the main entrance and the Crocodile Museum).

Inside the temple (area A) heterogeneous linear anomalies, picked up by the 200MHz measuring antenna, were interpreted as electric cables ‘or the foundation layer thickness which is followed by relatively saturated-bedrock/soil (6m to 8m deep) (p.38 of translation)

Within the area surrounding the temple (mainly the Open Court), the 200MHz measuring antenna, identified homogenous linear anomalies that were interpreted as ‘past-human activities (archaeological structures and restoration works indications) and the backfill thickness are almost clear and followed by relatively saturated-bedrock/soil’ (p.38 of translation).

Within Area C, within the Main Entrance and the Crocodile Museum, using the 200MHz measuring antenna, homogenous and distinctive linear anomalies were interpreted as ‘backfill thickness is obviously clear and followed by naturally saturated-bedrock/soil (Nile River mud/clay’ (p.38 of translation).

The 80MHz , 40 MHz and 35MHz measuring antenna identified homogenous linear anomalies interpreted as ‘deeper past-human activities (archaeological structures and restoration works indications)’ (pages 46-49 of translation).

Geo-Electrical Field Measurements (1D/2D Electrical Resistivity Surveys)

For the Electrical Resistivity survey two 1D vertical electrical soundings were taken within the Open Court, with a maximum lateral spacing of c.40m, investigating to a depth of c. 80m. Within the temple and surrounding areas

twenty-four electrical resistivity profiles were taken, spaced between 1m and 2 m apart, with lengths from 40.0m to 60.0m (NRAIG 2010: ch1-1).

Within the Open Court the 1D vertical electrical soundings shows ‘a surficial backfill later (2.70m to 3.30m thick) of high electrical resistivity…. This is followed by a relatively thick and low resistive (conductive) subsurface layer…. With relatively high subterraneous/ground water saturation or moisture content’ (p. 60 of translation).
The 2D inverted geo-electric sections showed ‘some isolated surficial high/very high resistive anomalies…close to the stony layer, within both the inner and outer temple yards. The separate zones of high subterraneous/ground water saturation or moisture content within the whole foundation layer, from 2.30 to 6.30 m deep, are repeatedly encountered along some profiles’ (p.60 of translation).

Shallow Seismic Refraction Field Measurements

Within the Open Court ten shallow Seismic Refraction surveying profiles were taken, with a length of c. 36m and to depth of investigation of c. 8m. These showed ‘ a surficial friable sandy/silty gravel backfill layer (1.50m to 2.50m thick) of very low (primary) seismic velocity… This is followed by a relatively thick and low/intermediate seismic velocity subsurface layer… with relatively high subterraneous/ground water saturation or moisture content. Such base layer is laterally varied, to a higher velocity layer at the middle of the survey area….and therefore more compacted’ (p.67 of translation).

Conclusions to the report

The frontal area of the temple has a high subterraneous/ground water saturation and that this areas represents a ‘weak and unstable subsurface zone’.

There are near surface archaeological structures/restoration work.
That there are subsurface tunnel/passage connected the Nilometer with the Nile.

14 APPENDIX 3. ARCHAEOLOGICAL ASSESSMENT OF TEST PIT EXCAVATIONS

Introduction

This report presents the archaeological data recorded during the excavation of twelve test pits at the site of Kom Ombo between 1 March and 24 March 2015 (Figure 1). As part of their geotechnical data collection in the creation and design of a groundwater lowering solution to the site of Kom Ombo, CDM Smith proposed the excavation of test pits next to the temple walls to check, a) the foundation level of the walls, and b) the composition of material upon which the walls are founded. Given the sensitive location of these test pits within the site of Kom Ombo the test pits were excavated by hand by professional ARCE archaeologists: Essam Shehab, Hussein Rekaby and Mohamed Ahmed Abdel Rahman with participation of the Engineer from CDM Smith.

The locations of the test pits were established based on discussions between CDM Smith, Abdel Moneim (MoA Director of Kom Ombo) and ARCE archaeologists. It was agreed prior to excavation that the discovery of any original temple stonework within a test pit would be reason to halt the excavation of that particular test pit. The test pits were excavated and recorded using the 'single-context' methodology (Museum of London Archaeology Services 1994; Harris 1979). A photographic record was also kept throughout the excavation. The archive for these excavations is deposited with ARCE.

Since there were no known benchmarks on the Kom Ombo site we used a hypothetical temporary bench mark (TBM) named (Nilometer TBM) with value 80.00m asl. From this TBM we traversed a new TBM (Birth house TBM) with value 84.54m. This was later corrected by CDM Smith to +12.95m, making the real value of Nilometer TBM at 92.95m asl and the value of Birth House

TBM at 97.49m asl. The original archive uses the hypothetical temporary benchmark while the corrected benchmark is used here within this report.

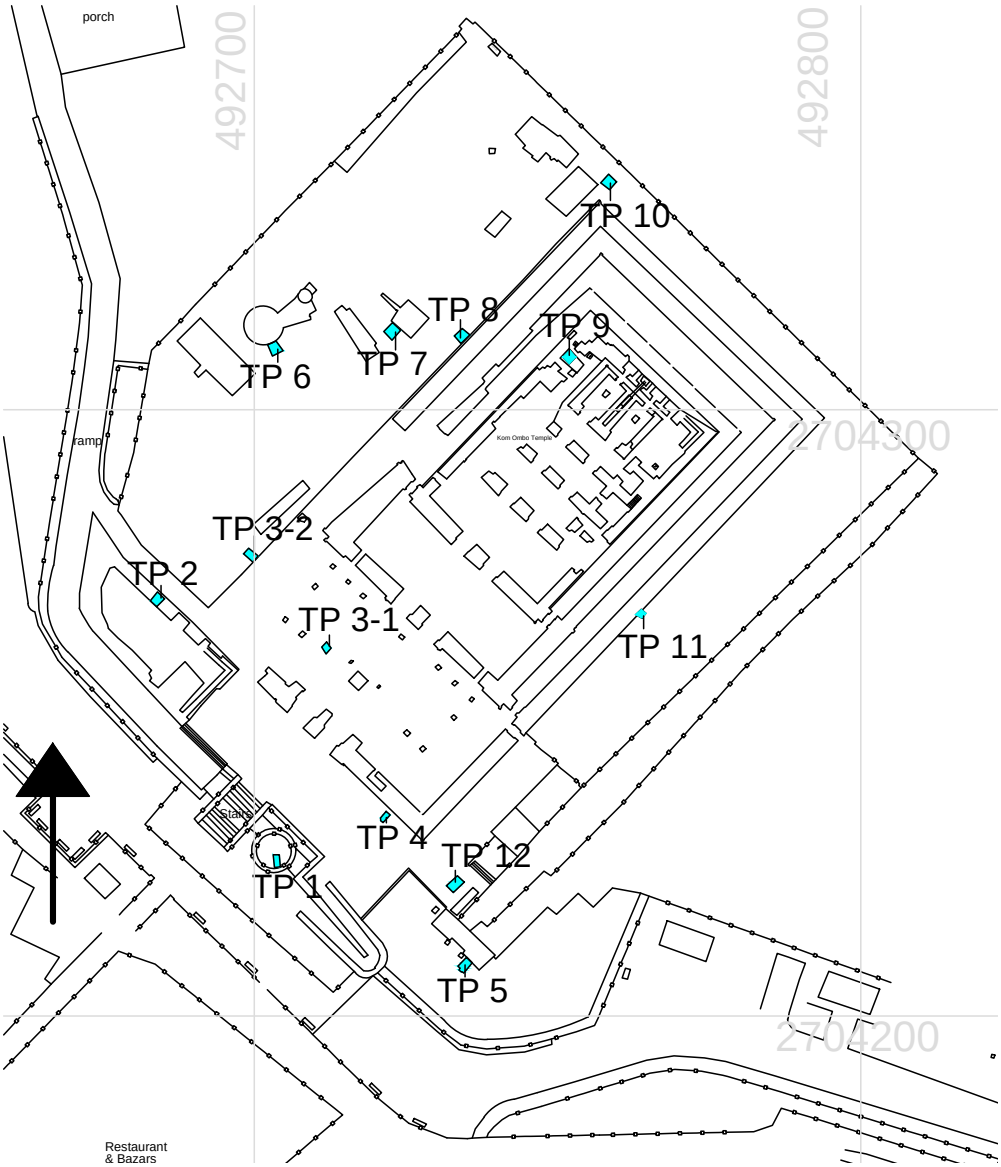


Figure 1. Locations of test pits

Results

Test pit 1 (Zone 9)

Test pit 1 (Figure 2) was located within the SW Nilometer in front of the temple, against the SE internal face of the Nilometer. Initially the dimensions of the pit were planned as 1.2m by 0.80m but it became clear that this would not be large enough to excavate so it was enlarged to 1.2m (E-W) by 2.2m (N-S) by 3m deep. The geotechnical aim was to identify the depth of the Nilometer, what it is founded upon and what is below.

Figure 2. Test Pit 1; pre-excavation photograph. S. facing

We found that this portion of the Nilometer was a modern reconstruction. The base of the foundation was also modern and was reached at a depth of 91.0 m asl. The wall comprised three courses (Figures 3 and 4). The eastern side of the Nilometer appears to be an original structure.

Beneath this reconstruction we recorded a sequence of clay, sandy clay and sandy silt deposits 2.00m thick containing burnt mud brick (or red brick) that sloped down from north to south. These deposits may have been dumped as

leveling for this area in order to reconstruct the western portion of the Nilometer which may have been severely damaged by earlier Nile flooding.

Figure 3. Test Pit 1: post excavation photograph. S. facing

We encountered a clay deposit with red brick (possibly burnt mudbrick) fragments [106] at the base of Test Pit 1, at 88.99m asl (Figure 5). This was sealed by a sandy silt deposit [105] mixed with red brick (possibly burnt mudbrick) and stone fragments. From this deposit we retrieved a decorated sandstone fragment (Figure 6). This was overlain by a sandy clay mixed with red brick fragments (possibly burnt mudbrick) [104], then a sandy silt mixed with red brick fragments [103] covered by a dense clay layer [102]. The modern Nilometer reconstruction was founded upon this clay and the area then filled with sandy ashy silt [101] and a layer of recently laid gravel [100]. The gravel was laid throughout the Nilometer (Figure 2).

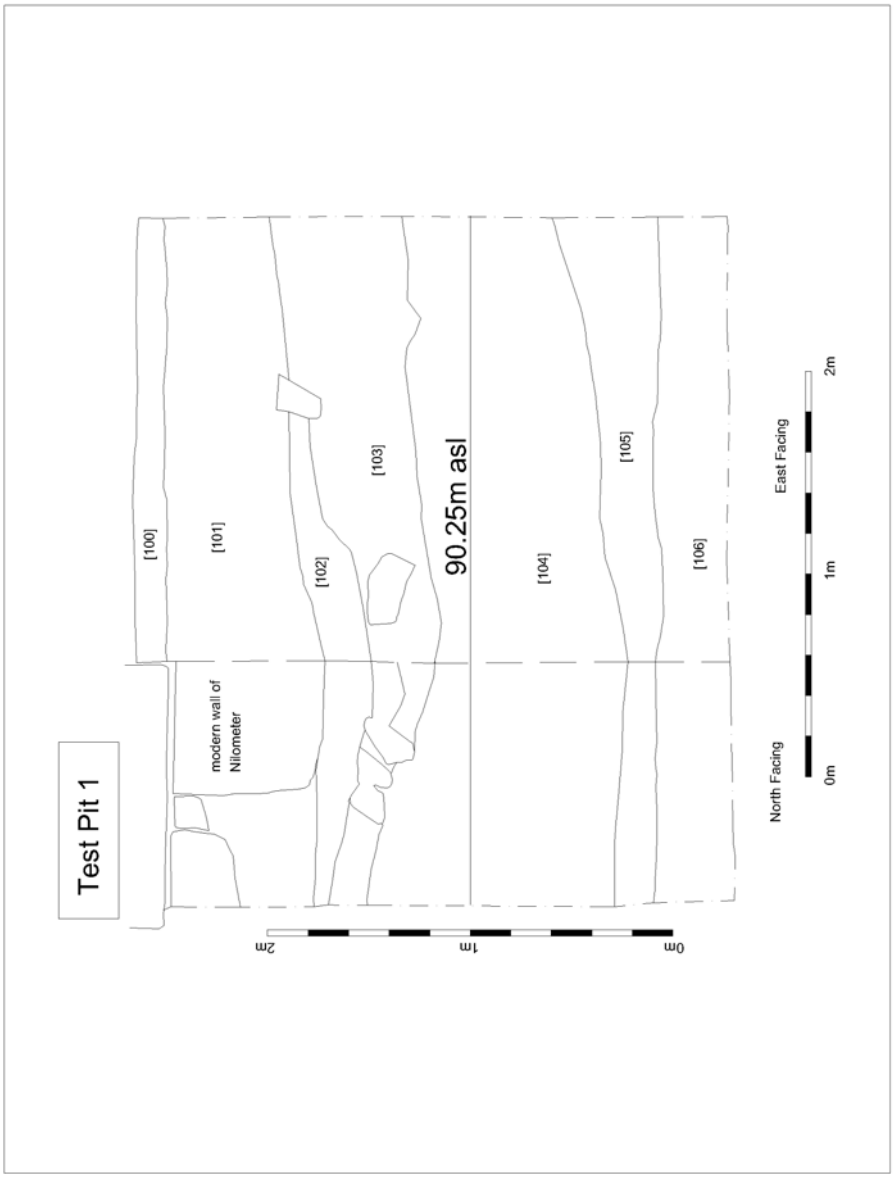


Figure 4. North and East facing section of Test Pit 1

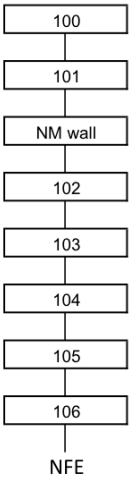


Figure 5. Harris Matrix of features recorded in Test Pit 1

Figure 6. The decorated sandstone fragment in deposit [105]

Test Pit 2 (Zone 4)

Test pit 2 (Figure 7) was located within the Open Court against the east face of the eastern wall of the Birth House (also referred to as the Mamissi). The pit was orientated E-W, measuring approximately 1.90m E-W by 1.20m N-S by approximately 2.35m deep. Within Test Pit 2 we reached the base of the Birth House wall and also recorded two mudbrick walls constructed after the Birth House.

Figure 7. Test Pit 2: pre-excavation photograph. S-W facing

We identified the base of the east wall of the Birth House [126] at 94.93m asl (Figure 8). The wall had been built within a NW-SE foundation trench [125] that was found to cut an earlier mudbrick wall [124] that filled the entirety of the test pit (Figures 9, 10, 11 and 12). The bricks of wall [124] were 38cm long by 18cm wide. This was a substantial structure, recorded at level 95.78 m asl filling the whole test pit and extending beyond all limits of excavation including beneath the Birth House wall. Based on its size, we suggest that this wall could have been an earlier enclosure wall. A silty sand deposit 1.45m thick (possibly alluvial) containing sandstone chips [123] was recorded above wall [124]. This deposit was laid after the Birth House wall had been constructed. We identified a N-S mud brick wall [121] (Figures 13 and 14) measuring approximately 1.85m E-W and 0.35m N-S and surviving only 10cm high (one course) founded on silty sand [123], at 96.29m asl. The wall lay along the SE limits of the trench, extending SE and NE, and abutted the east face of the eastern Birth House sandstone wall. A deposit of mud brick collapse [122] respected the NW face of the wall, filling the trench. This was sealed by a very thin leveling layer of sandy silt [120] which covered all of the court and represented leveling beneath the modern gravel. The sandy silt was sealed by

a layer of recently laid gravel [119]. This gravel was laid throughout the open court.

Figure 8. The foundation of birth house sandstone wall [126]. SW facing

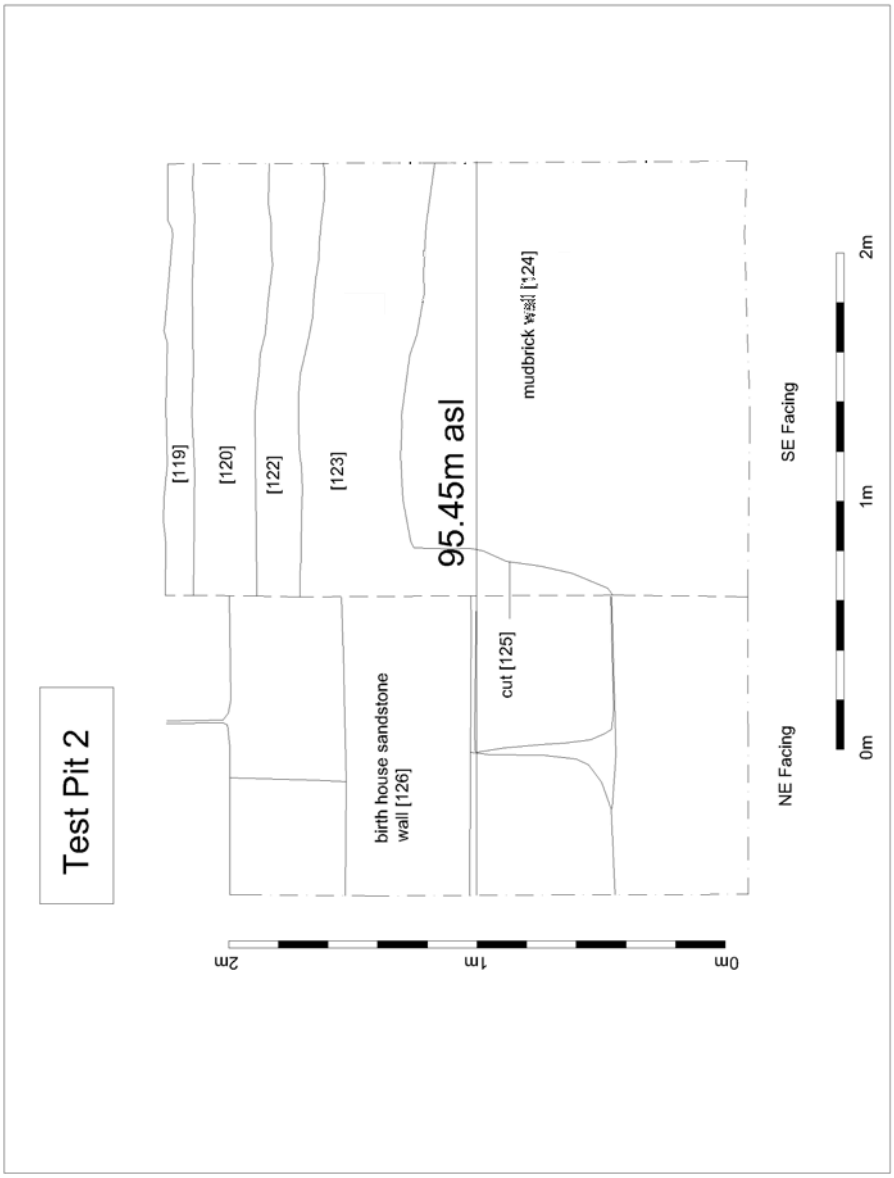


Figure 9. NE and SE facing sections of Test Pit 2

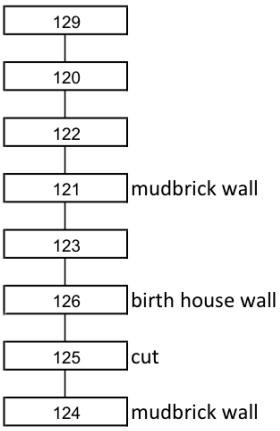


Figure 10. Harris Matrix of features recorded in Test Pit 2

Figure 11. Mudbrick wall [124] filling the entirety of the test pit and the foundation cut [125] for wall [126] SW facing

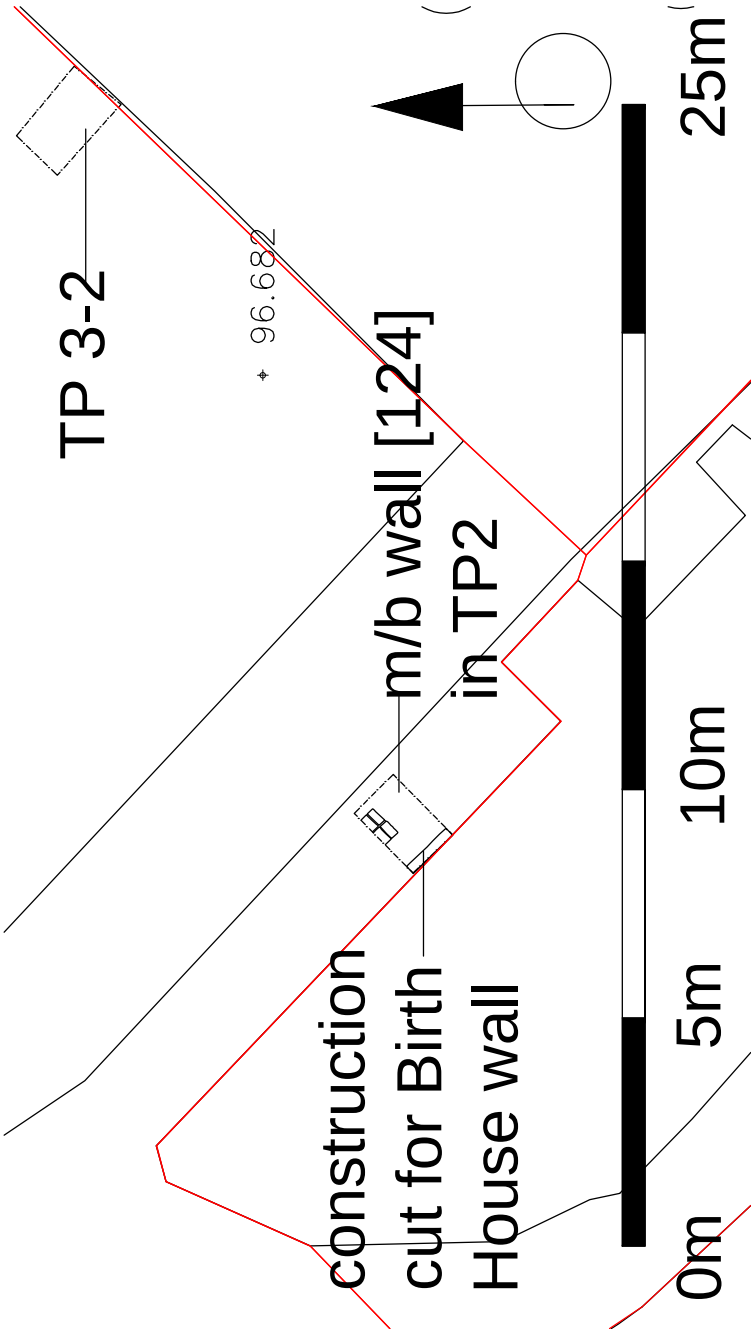


Figure 12. Plan of wall [124] in Test Pit 2

Figure 13. The mudbrick wall [121] in Test Pit 2. S facing

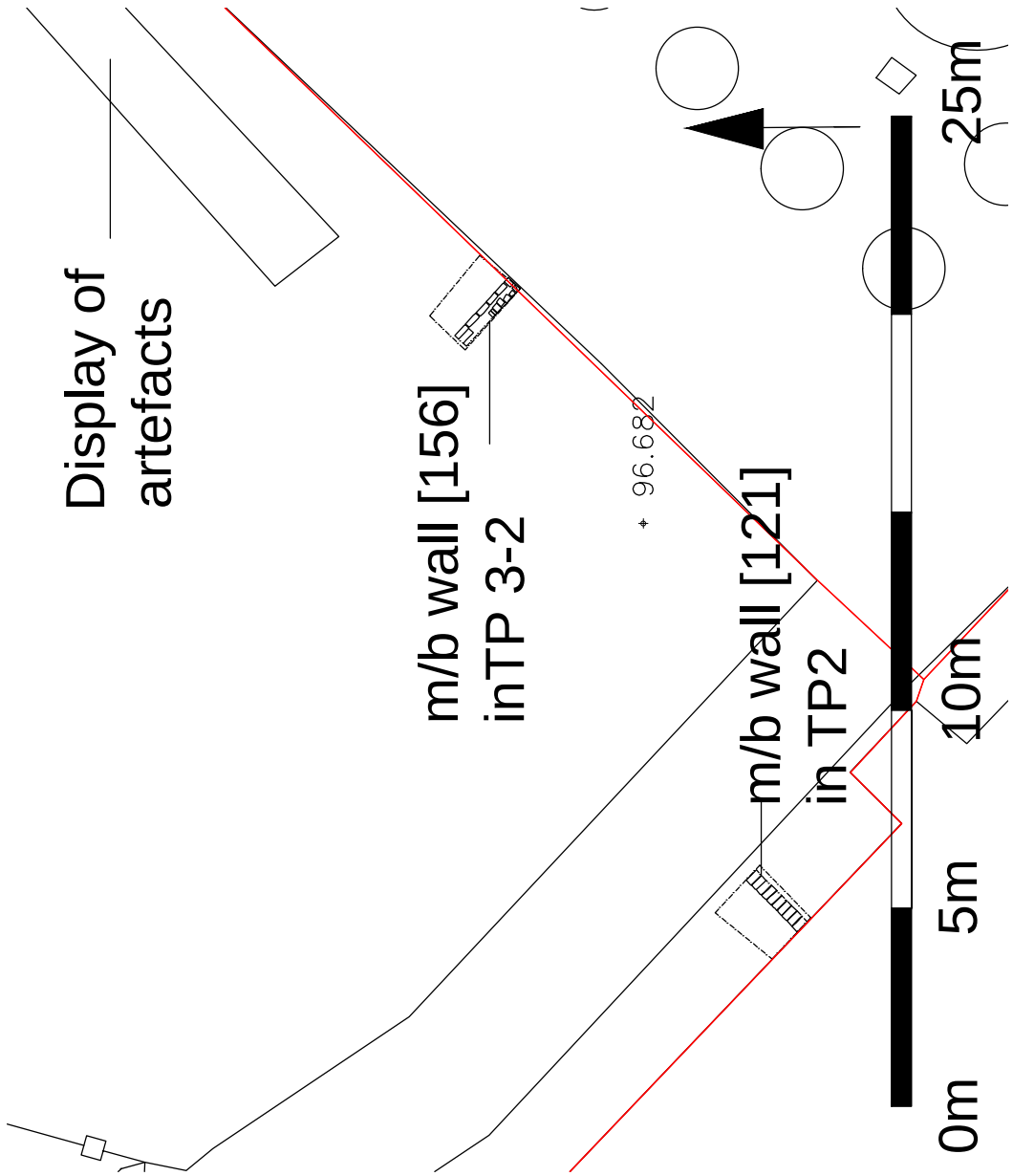


Figure 14. Plan of Wall [121] in Test Pit 2

Test pit 3 (TP 3.1 Zone 2; TP 3.2 Zone 4)

Initially Test Pit 3 (later referred to as Test Pit 3.1) was located at the western corner of the temple forecourt (1.40m N-S by 1.30m E-W) to record the foundation of forecourt blocks and the material upon which they are founded. An area where blocks are missing was chosen (Figure 15). However after

removing one modern layer of gravel [117] we came to the original sandstone floor (Figure 16) so excavation was halted.

Figure 15. Pre-excavation photograph of Test Pit 3.1

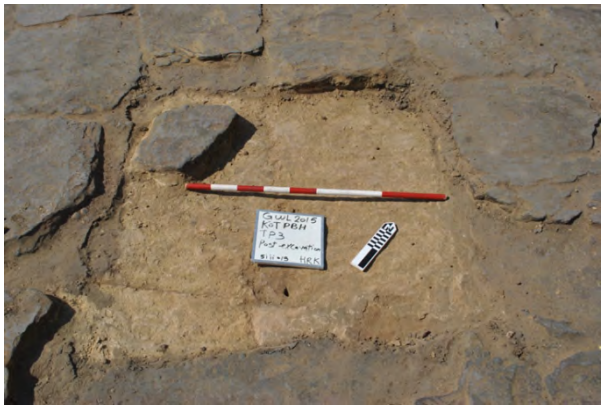


Figure 16. The original sandstone floor [118] in Test Pit 3.1

We then re-located Test Pit 3 (referred to as Test Pit 3.2) to the Open Court, against the northern outer face of the sandstone wall of the temple (Figure 17). The test pit measured approximately 2.00m E-W by 2.00m N-S by approximately 2.30m deep. We reached the base of the temple wall at 94.51m asl [162] (figures 18 and 19). The foundation of the wall steps out to the northwest. The wall appeared to be ‘trench built’ – being both founded upon and cutting a layer of silty sand. A sequence of deposits 1.68m thick sealed this, including sandy silt [161], crushed stone mixed with silt [160],

ashy sandy silt [158] containing pottery dated to the Late Roman Period and sandy silt [157] possibly relating to the later occupation of the court. These were sealed by a mudbrick wall orientated NW-SE. Deposits laid subsequently may relate to the modern clearances and maintenance of this area (Figures 18 and 19).

There were no clear floors within this sequence, although there is a possibility that deposit [157] may have been a surface. A mudbrick wall [156] surviving 34cm high (3 courses high) with foundation level 96.05m asl, was founded on this upper layer (figures 20 and 21). The wall is located in the western limits of the trench, extending west and north beyond the limits of the trench, and abuts the north face of the temple wall. The wall appears to be part of the later occupation in the court. A deposit of crushed sandstone mixed with silt [155] respected the east face of this wall. Within this deposit we found two small fragments of sandstone with hieroglyphic inscriptions (object nos. 2015-1004 and 2015-1005). A deposit of sandy silt [154] sealed the wall and deposit [155] was overlain by the recently laid gravel surface [153].

Figure 17. Test Pit 3-2: pre-excavation photograph. SE facing

Figure 18. Test Pit 3-2: post-excavation photograph showing the foundation of northern sandstone wall of the temple. SE Facing

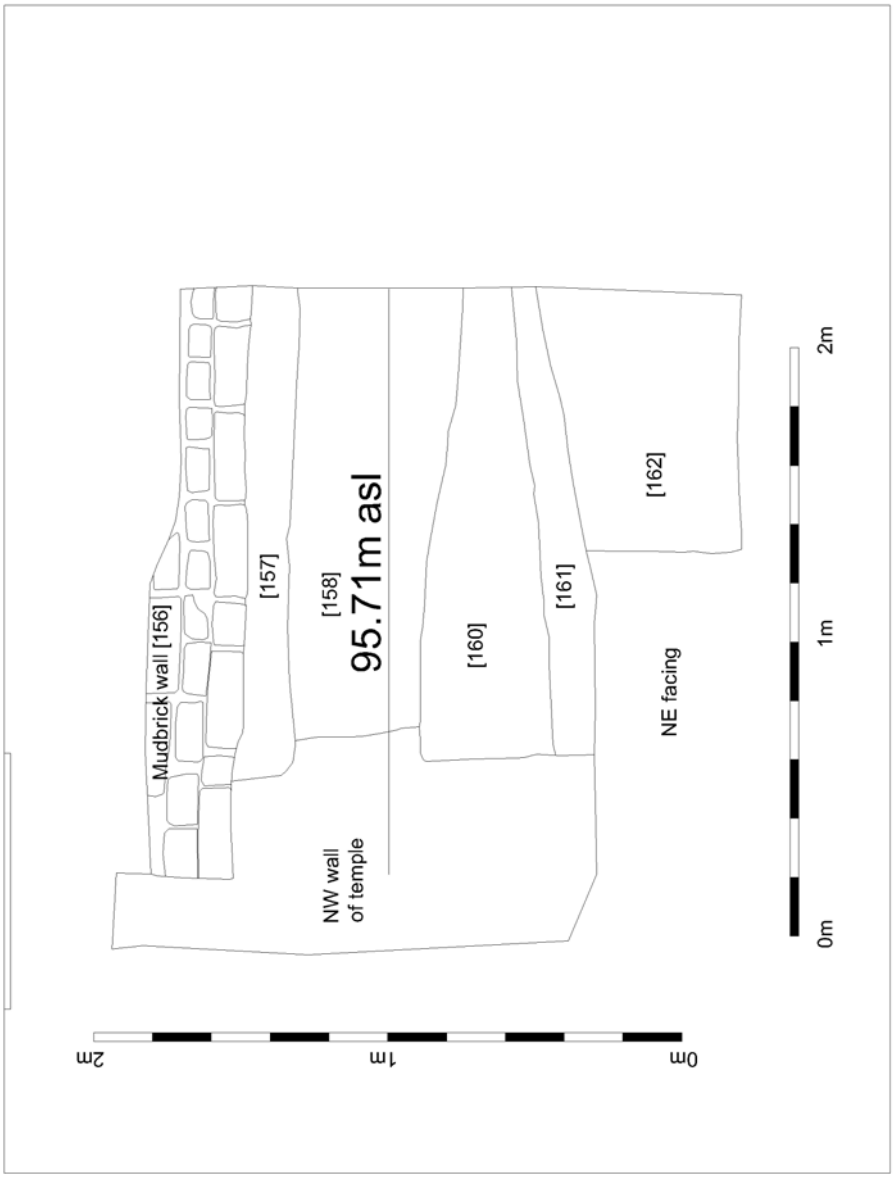


Figure 19. Northeast facing section of Test Pit 3-2

Figure 20. Mudbrick wall [156] in Test Pit 3-2. SW facing

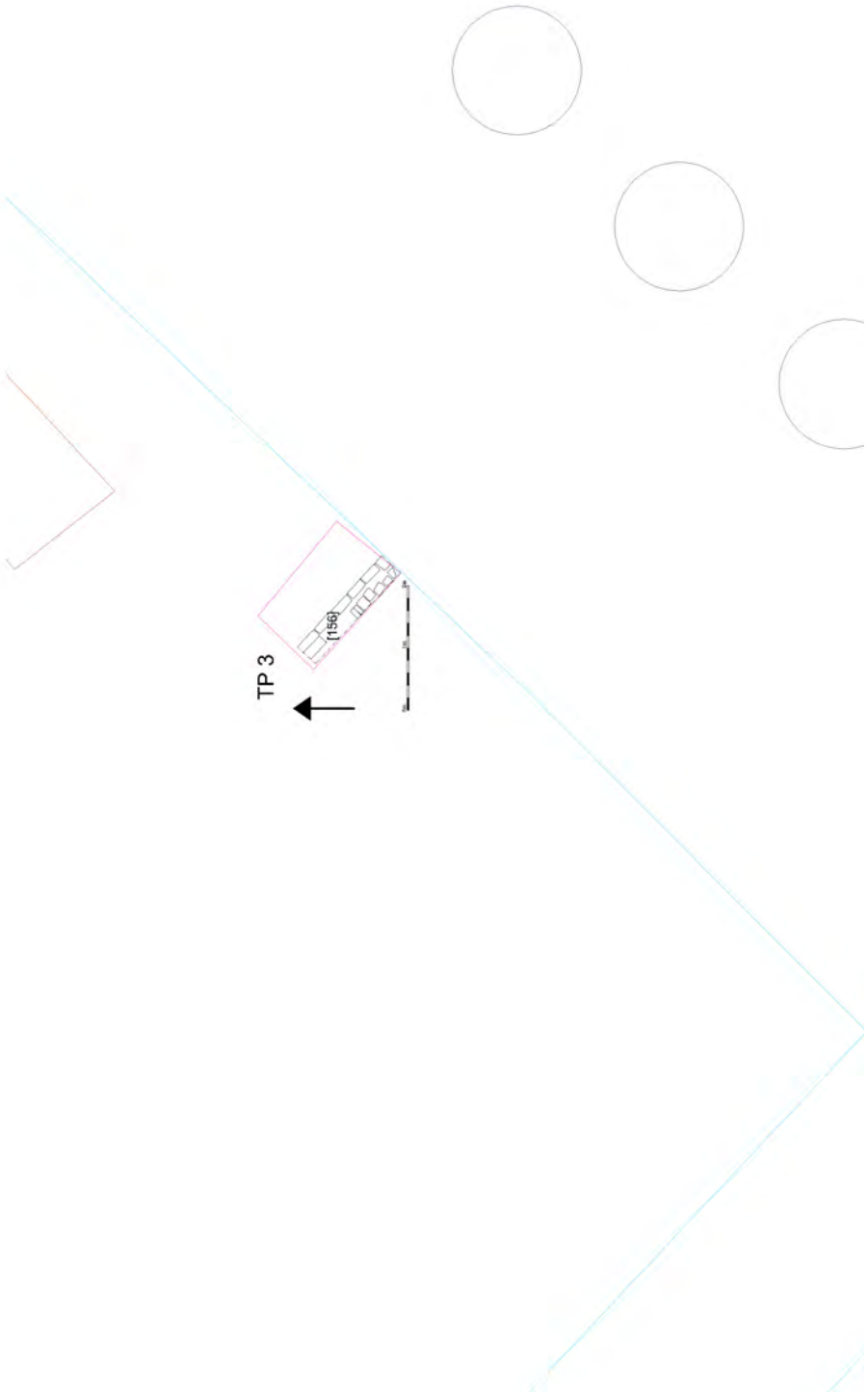


Figure 21. Plan of wall [156] in Test Pit 3-2

- ***Test pit 4 (Zone 3)***

Test pit 4 was located against the west face of the forecourt (Figure 22). The dimensions were 1.30m (N-S) by 1.65m (E-W) by 0.40m depth. The purpose of this trench was to locate the foundation level of the wall and record the material upon which it is founded.

Figure 22. Pre-excavation photograph of Test Pit 4

At 0.40m deep (95.93m asl) we encountered the original sandstone floor [116] in front of the forecourt (Figure 23) and therefore halted the excavation. The floor was covered with two modern make-up layers upon which modern sandstone blocks had been laid.

Figure 23. Excavation photograph of Test Pit 4

- ***Test pit 5 (Zone 3)***

Test pit 5 was located to the west of the southern gate of the temple (Figure 24) and measured 1.35m (E-W) by 2.2m (N-S) by 2.60m deep.

There was no evidence of the original floor in front of the gate. We located the foundation of the gate at 93.39m asl (2.60 m below the current modern floor level) (Figure 25). The gate appears to have been trench built, cutting through and founded upon a sandy silt deposit with redbrick fragments (burned mud bricks) [111] (Figure 26). Pottery from this feature has been dated to the late Ptolemaic Period (see appendix 3). This feature was 1.71m thick against the west face of the gate. It was sealed by an ashy silt mixed with reddened brick fragments (burned mudbrick) [110] and contained pottery dating to the Late Roman Period (see appendix 3). This was sealed by a series of features relating to the modern restoration of the temple including concrete [109], a sand leveling layer [108] capped with modern sandstone

paving blocks [107]. We did not record any evidence of water damage on the west face of the gate.

Figure 24.Test Pit 5: pre-excavation photograph. E facing

Figure 25. Excavation photograph of Test Pit 5. NE facing

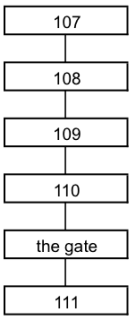


Figure 26. Harris Matrix of Test Pit 5

- ***Test pit 6 (Zone 4)***

Test pit 6 was located at the southern outer face of the Nilometer in the Open Court (Figure 27). The dimensions were approximately 2.00m E-W by 2.00m N-S by approximately 1.70m deep. Its purpose was to locate the foundation level of the Nilometer and the underlying material on which it is founded.

Figure 27. Pre-excavation of Test Pit 6. North facing

The stratigraphic sequence in this trench was perplexing. We had expected to see a construction cut for the Nilometer wall within the excavation and although there was a clear modern cut against the wall, apparently to carry out some repairs on the wall, there was no sign of a foundation cut. Either the edge of that cut is further south and outside the limit of the test pit, or the wall is 'trench built' (built directly up against the side of a foundation cut), or at some point in the last century the ground level was lower than, or commensurate with the base of the trench. The original floor level associated with the Nilometer is indicated by the line that differentiates the dressed and undressed surfaces of the blocks with the rough, undressed blocks having once been below floor level. (Figure 27). This is at approximately 96.45m asl.

(Compare with the top of the foundation stones in Test Pit 7 at c. 95.50m asl and in Test Pit 3.2 at 96.66m asl.)

At the base of the trench we recorded a silty clay deposit mixed with pottery sherds [132] at 94.68m asl (Figures 28, 29 and 30). This material seemed to respect the wall of the Nilometer. It was sealed by a deposit of sandy silt 0.42m thick [131]. This deposit was cut by a linear N-S cut, 0.42 m deep [130], filled and sealed by a 0.42m thick deposit of sand [129] which had been truncated by a cut, against the outer wall apparently cut so that modern repairs could be made to the Nilometer wall as shown by patches of cement mortar (Figure 31). The sand and cut were covered with a 0.87m deep ash rich deposit with reddened brick fragments (burned mudbrick) [128] which contained Late Roman pottery (see appendix 3). This was sealed by the recently laid floor of the Open Court [127].

Figure 28. Excavation of Test Pit 6. W facing

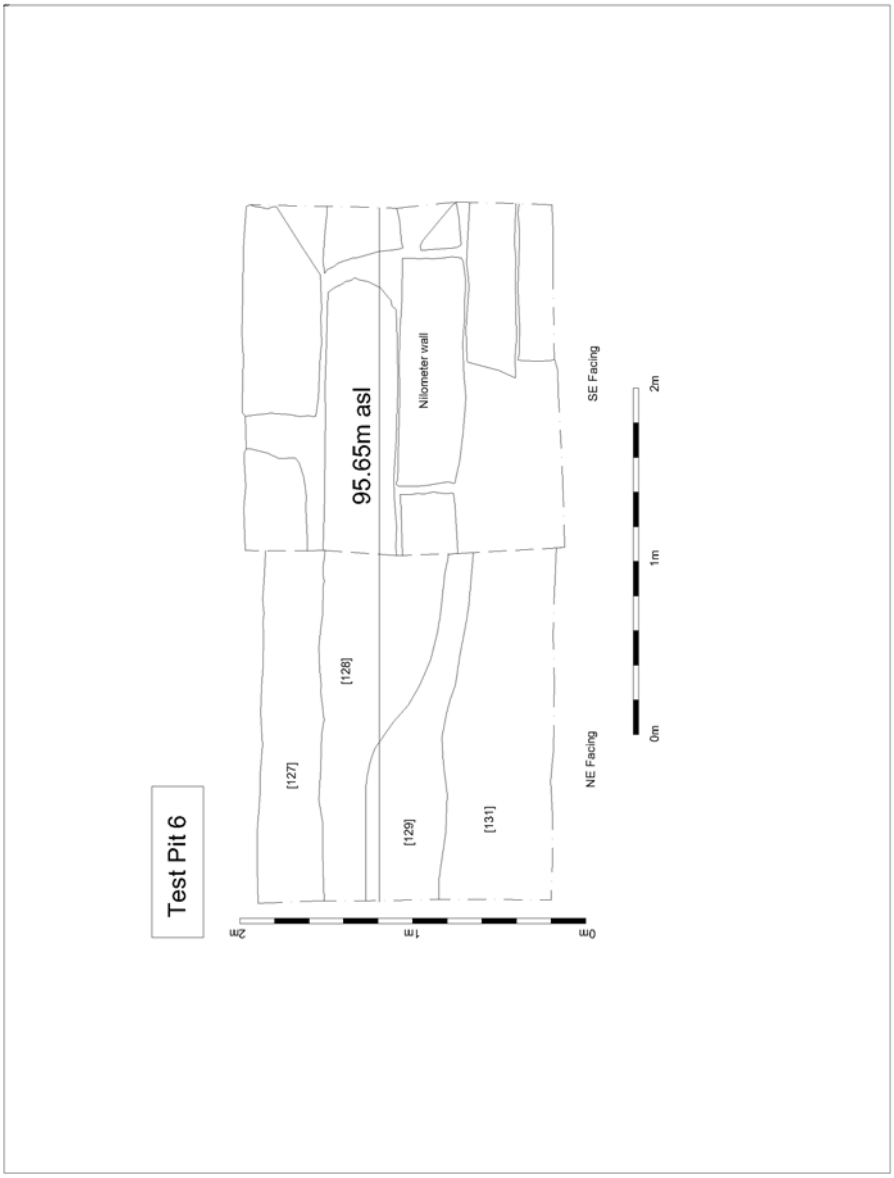


Figure 29. NE and SE facing Sections of Test Pit 6

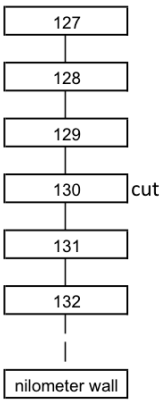


Figure 30. Harris matrix of features recorded in Test Pit 6

Figure 31. The modern cemented bonding material between the blocks

- ***Test pit 7 (Zone 4)***

Test pit 7 was located against the outer face of the western sandstone wall of the 'Crocodile Basin' in the Open Court (Figure 32). The trench measured approximately 2.00m E-W by 2.00m N-S by approximately 1.50m deep. Again, the purpose was to locate the foundation level of the wall and what is beneath it. We reached the foundation level at 95.42m asl. The wall appeared to have been trench built, cutting through and founded upon a red ash/burnt mudbrick powder [137] (Figures 33, 34 and 35). This was sealed at 0.67m by a thick dense clay deposit with a linear appearance [136]. This was sealed by a 0.82m thick deposit of burned mudbrick tumble mixed with sandstone blocks [135], containing 6th - 8th century AD pottery (see appendix 3). Above this we recorded a sandy silt deposit [134] that covers all the court under the modern gravel and was laid down as leveling material for the overlying, recently laid Open Court gravel surface [133].

Figure 32. Test Pit 7: pre-excavation photograph. SE facing

Figure 33. Test Pit 7: excavation photograph. E facing

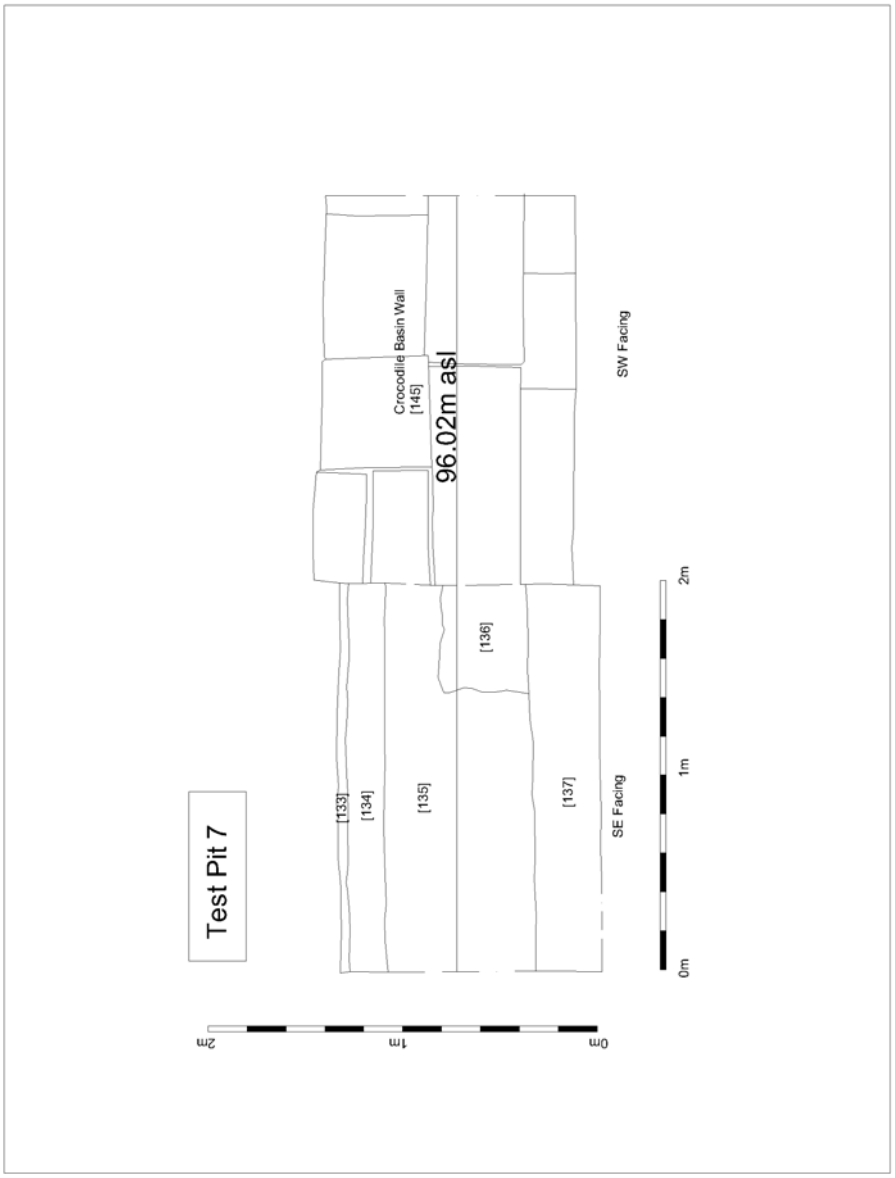


Figure 34. Southeast and southwest facing sections of Test Pit 7

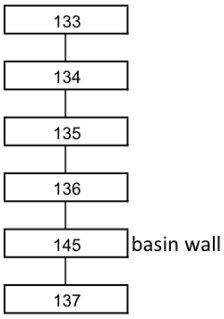


Figure 35. Harris Matrix of features recorded in Test Pit 7

- ***Test Pit 8 (Zone 4)***

Test pit 8 was located against the north face of the northern sandstone wall of the temple (Figure 36) within the Open Court. It measured approximately 2 m N-S by 1.50m E-W by approximately 2.10m deep. The purpose was to identify the foundation level of the wall and what lies beneath. We reached the base of the wall at 94.71m asl. At the base of the trench we found that the foundation stones were founded upon a flat red ash/burnt mudbrick powder [147]. This was sealed by a 1.66 m thick deposit of silt mixed with red brick fragments (burnt mudbricks) and sandstone chips [146] (Figures 37, 38, 39). This layer had been dumped against the un-dressed foundation stones of the temple wall and therefore appeared to have been laid down to create a higher ground level in the Open Court during the construction of the temple. Deposit [146] contained Late Roman pottery, including one piece dated to the 5th - 7th century AD (see appendix 3). This would suggest a relatively late date for the construction of the outer wall. Above this, we recorded a silty sand deposit [144] and a sandy silt leveling deposit [143] for the recently deposited gravel surface [142].

Figure 36. Test Pit 8: pre-excavation photograph

Figure 37. Test Pit 8: excavation photograph showing the foundation of the northern sandstone wall of the temple

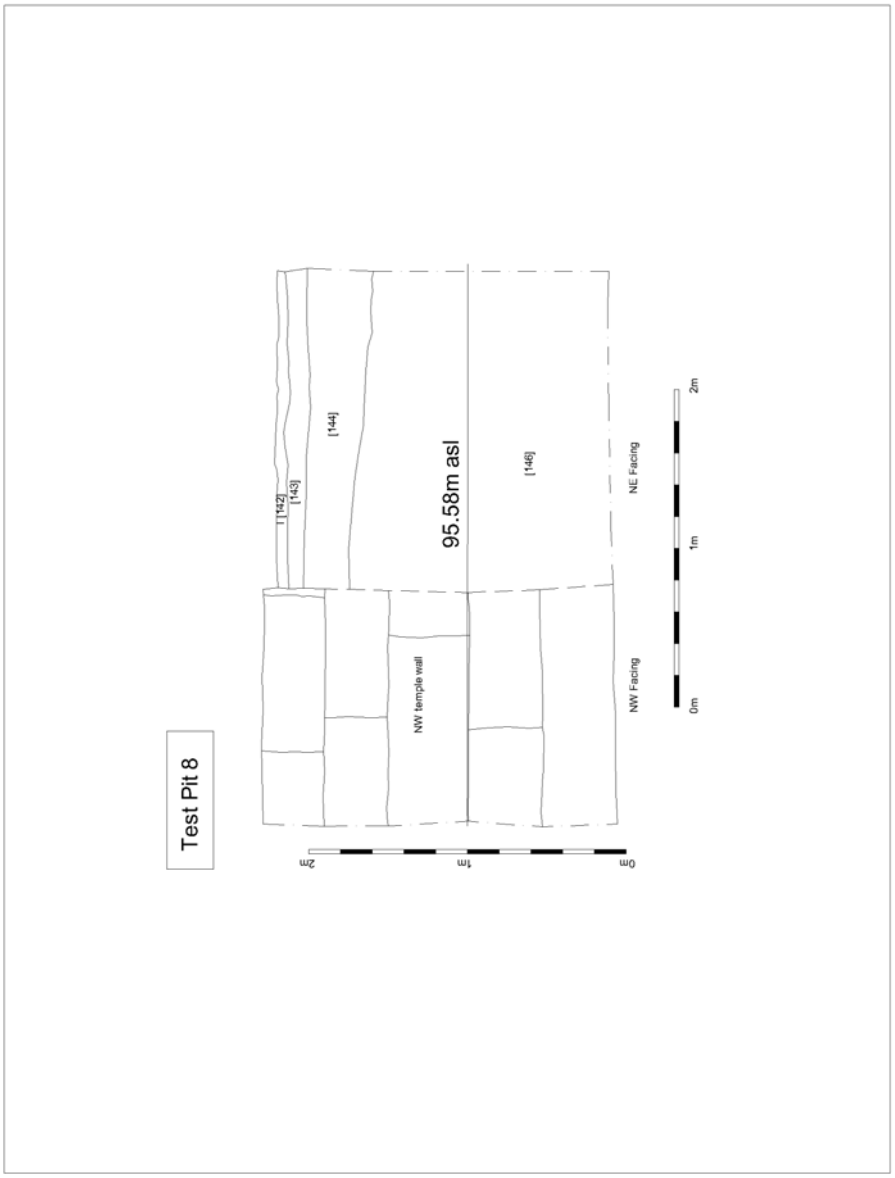


Figure 38. NW and NE facing section of Test Pit 8

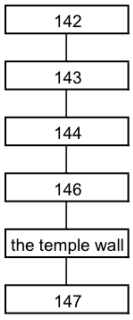


Figure 39. Harris matrix of features recorded within Test Pit 8.

- ***Test Pit 9 (Zone 1)***

Test Pit 9 was located inside the northern part of the temple, inside a rectangular shaped void in the sandstone blocks of the floor between the Horus sanctuary and the northern passage (Figure 40). The trench measured approximately 2.00m N-S by 1.80m E-W by approximately 2.50m deep. At the base of the trench there are irregular sandstone blocks at different levels that seem to step down to the northwest (95.17m asl to the east and 94.73m asl to the west) (Figure 41). Consequently, we halted our excavations here. The trench contained just two deposits: sandy silt mixed with gravels [139] and thick fine silty sand, c. 1.60m thick [140], which continued to extend beneath the sandstone floor, to the west. The floor may be a reconstruction, laid above the sand. In this limited exposure it is unclear how to interpret the irregular sandstone blocks at the base; they might be an underground channel similar to others found in this area (see description of Area Zone 1).

Figure 40. Test Pit 9: pre-excavation photograph

Figure 41. Test Pit 9: excavation photograph

- ***Test Pit 10 (Zone 4)***

Test Pit 10 is located at the rear of the temple in the northeast corner between the temple wall and outer mudbrick enclosure wall, and to the south of the Sobek chapel (Figure 42). The trench measured approximately 2.00m E-W by 2.00m N-S by approximately 0.45m deep. At the base of the trench we encountered a NW-SE aligned stone drain [151] 0.44m wide and 0.28m high at 96.76m asl (Figures 43, 44 and 45). The drain slopes from the northwest, 96.60m asl inside the drain, to southeast, 96.57m asl inside the drain). It is

also visible beneath the sandstone floor to the northwest and appears to lead to a square basin measuring c. 0.40 by 0.40m located 8.0m to the southeast. Beyond this there is a hole beneath the floor leading southeast suggesting that water ran from the northwest to the southeast behind the temple. The drain was founded on an ashy silt deposit [152]. The drain was completely sealed by a sandy-silt leveling layer [149] above which we recorded recently laid gravel [148].

Figure 42. Test Pit 10: pre-excavation photograph

Figure 43. The northwest-southeast aligned sand stone drain [151]. SE facing

Figure 44. Mohamed Abd el-Rahman and Hussein Rekaby recording the drain [151]

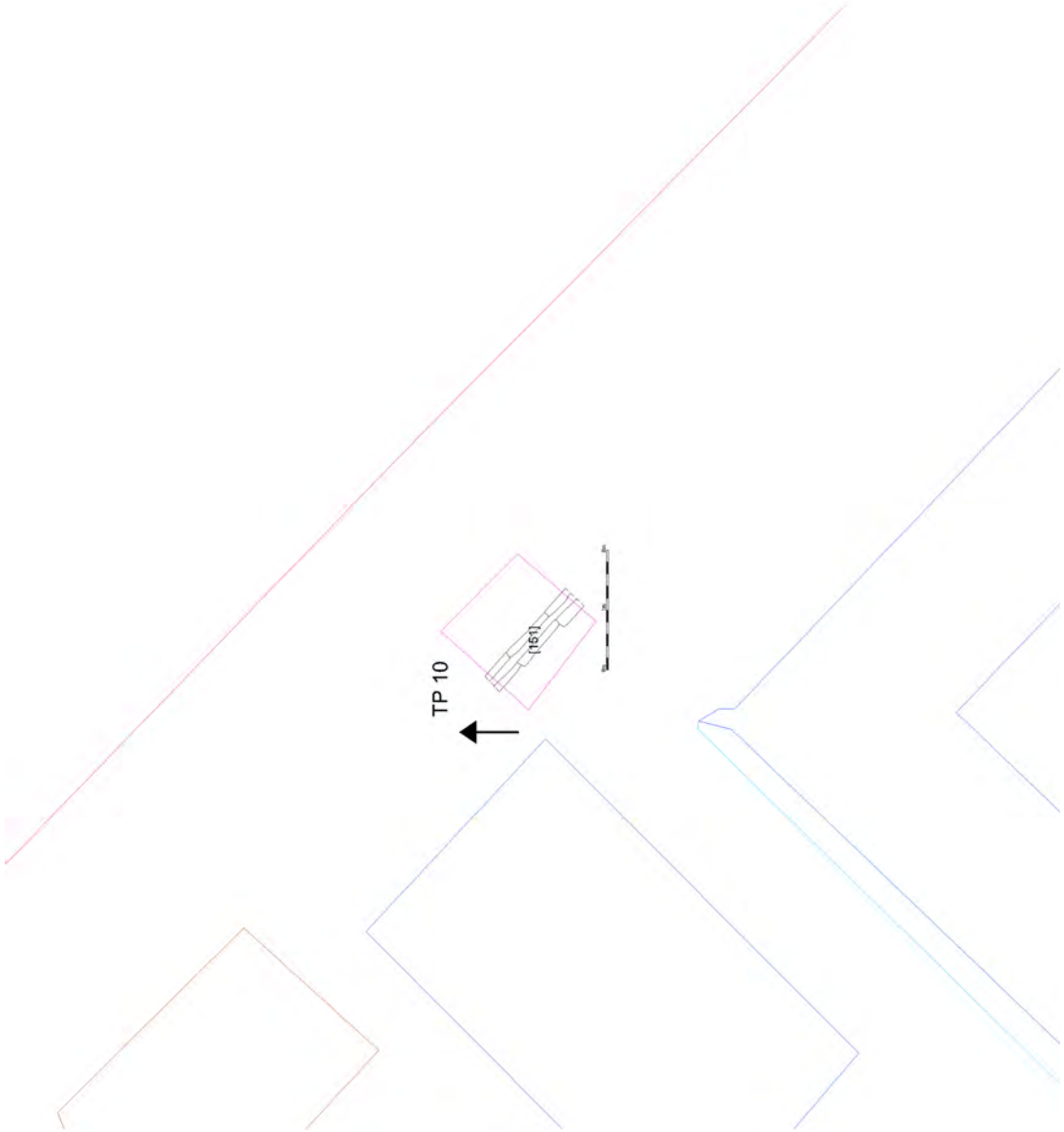


Figure 45. Plan of drain [151] in Test Pit 10

- ***Test pit 11 (Zone 6)***

Test Pit 11 was located against the modern mudbrick wall that forms the southern wall of the temple (Figure 46). The trench measured approximately

2.00m E-W by 2.00m N-S by approximately 1.80 m deep. This was a difficult trench to excavate, given that it was located down slope of the mound in this area (between the enclosure wall and the temple wall). This meant that debris was constantly falling into the trench making it dangerous to enter. The sections of the trench were sloped for safety reasons but this created a very small base area of the trench. We reached a level of 96.67m asl at the base of the trench which was also the base of the modern foundation wall (Figure 47). Excavations were halted here for safety reasons.

Figure 46. Test Pit 11: pre-excavation photograph. NW facing

We identified a construction cut [184] for the modern repair/rebuilding of the temple enclosure wall (Figure 48). The modern wall was made up of a sandstone foundation upon which the mud brick wall had been constructed. The cut was filled by a thick layer of silty sand mixed with burned mud brick fragments [180] containing modern material sealed by a spread of modern burnt rubbish [179]. This material abutted the south face of the wall. At the base of the test pit we exposed a large sandstone block at the base of the cut.

It is unclear whether this is from the original floor or from part of the original temple wall.

Figure 47. Test Pit 11: excavation photograph

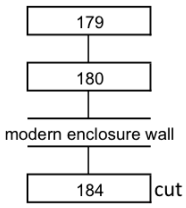


Figure 48. Harris matrix of features recorded in Test Pit 11

- ***Test Pit 12 (Zone 3)***

Test Pit 12 was located to the northeast of the South Gate approximately 14.60 m to the south of Test pit 4 (Figure 49). The trench measured approximately 2.00m E-W by 2.00m N-S by approximately 2.50m deep. At the base of the trench we encountered a mudbrick wall [171] at 94.28m asl] orientated NE-SW, measuring 1.66m by 0 .60m NW-SE and 0.60m high. This wall extended NE, NW and SW beyond the limits of the trench (Figures 50, 51, 52 and 53). The wall was founded at 93.68m asl over a deposit of ashy sandy silt [172]. The wall was extremely moist and the individual mudbricks were difficult to delineate. The wall had been cut by cut [170] which may represent dismantling or natural destruction. This was filled with fine sand 1.06 thick [169] which also covered the wall, which sloped downward to the southern corner. Above this lay a 1.10 m thick deposit of silty sand mixed with mudbricks [167] containing Ptolemaic Period pottery (3rd -2nd centuries BC) (see appendix 3). This formed the foundation layer for a later mudbrick wall surviving 0.45m high [168] orientated NW-SE and extending NW, NE and SE beyond the limits of the trench. Its foundation level is at 95.36m asl (Figures 54 and 44). We recorded a sandy silt deposit [166] respecting the west face

of this wall. Above this, and physically above the wall, we recorded two modern leveling deposits laid for the modern stone paving [163].

Figure 49. Test Pit 12: pre-excavation photograph. SE facing

Figure 50. Test Pit 12: post-excavation photograph. NW facing

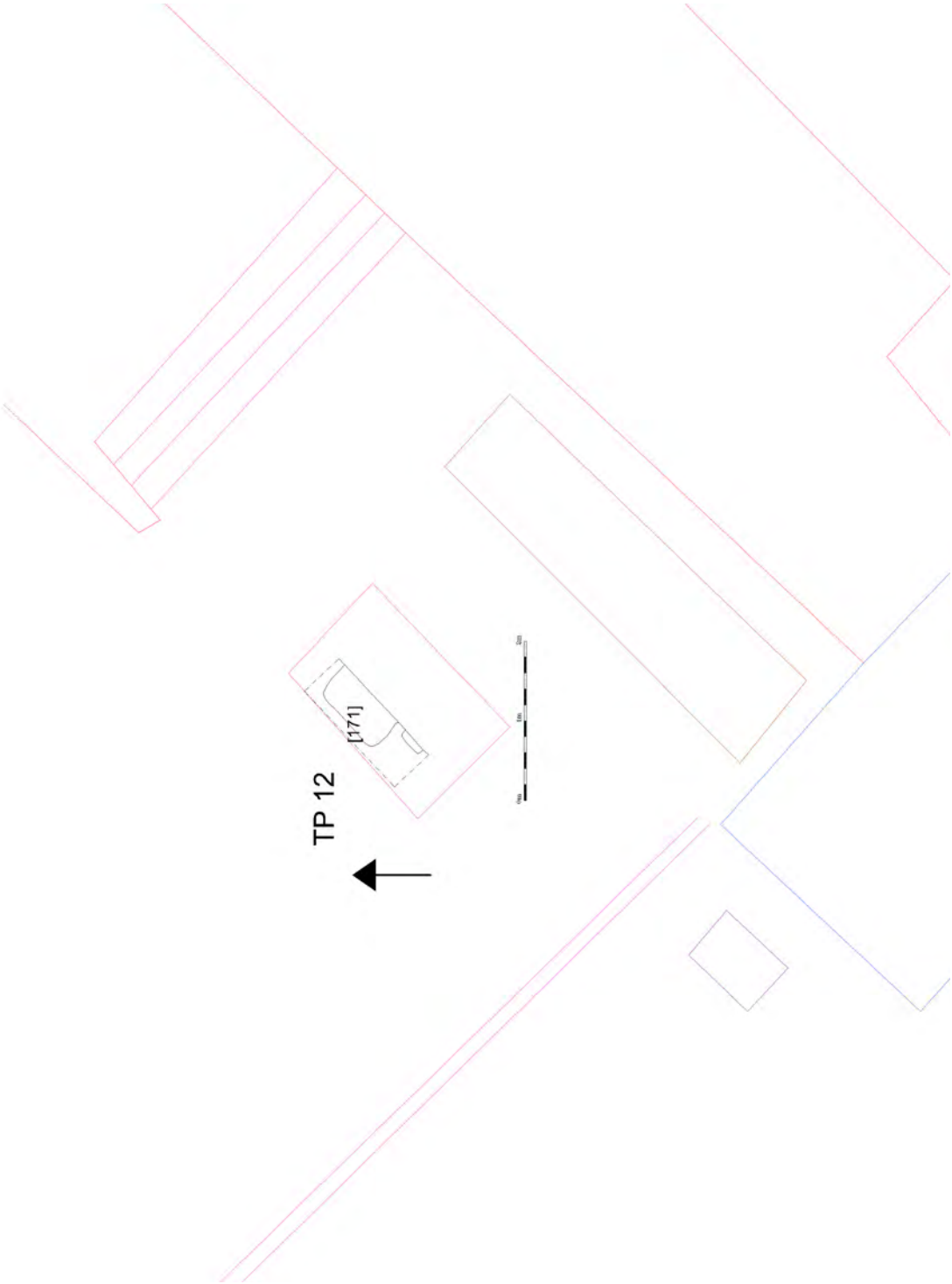


Figure 51. Plan of wall [171] in Test Pit 12

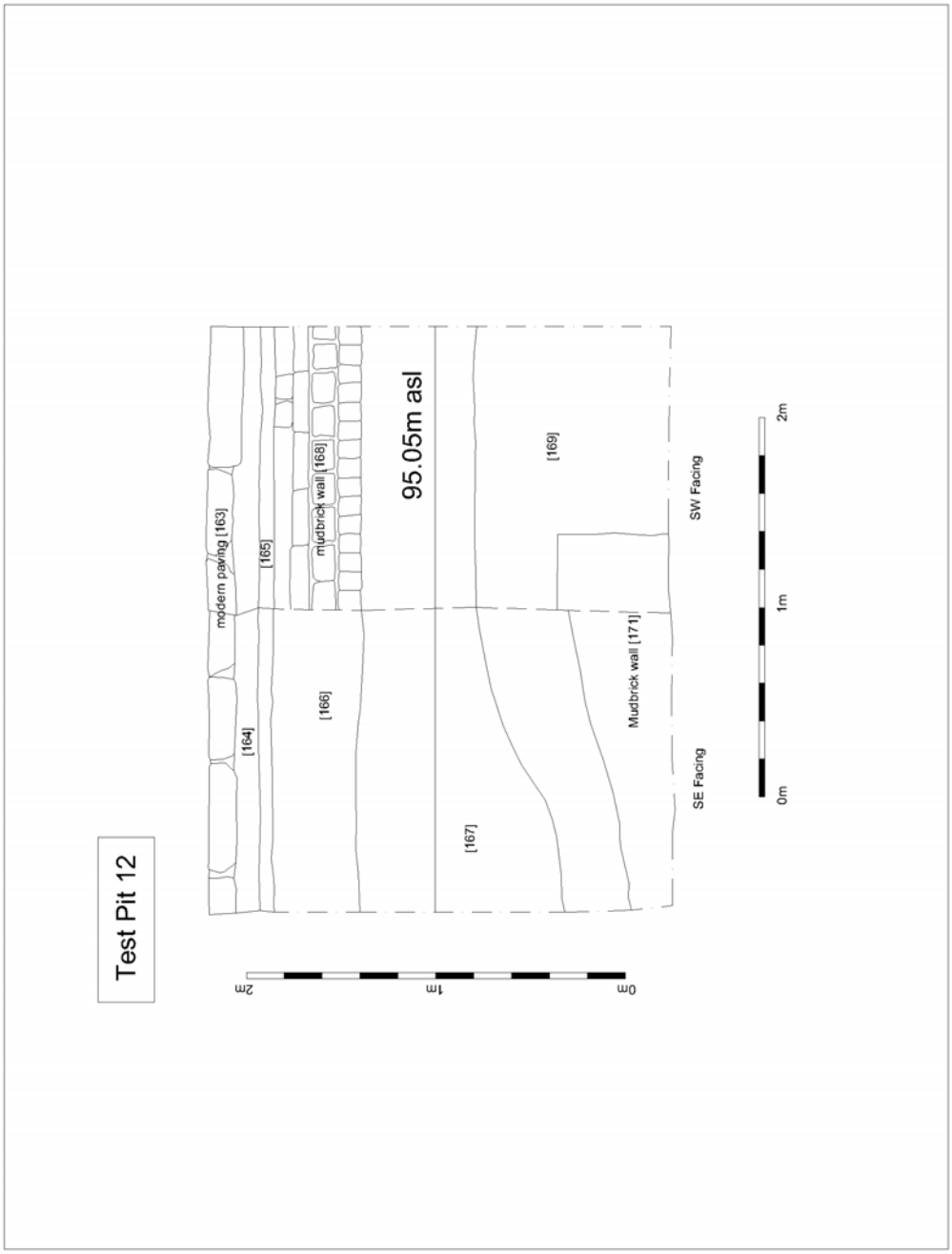


Figure 52. SE and SW facing section of Test Pit 12

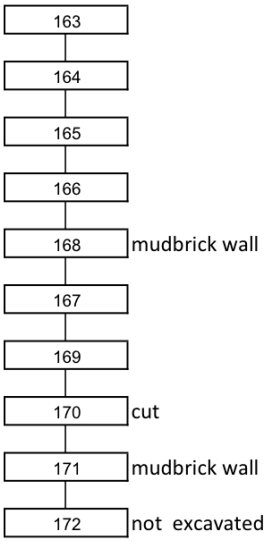


Figure 53. Harris Matrix of features recorded in Test Pit 12

Figure 54. Mudbrick wall [168] in Test Pit 12. NE facing

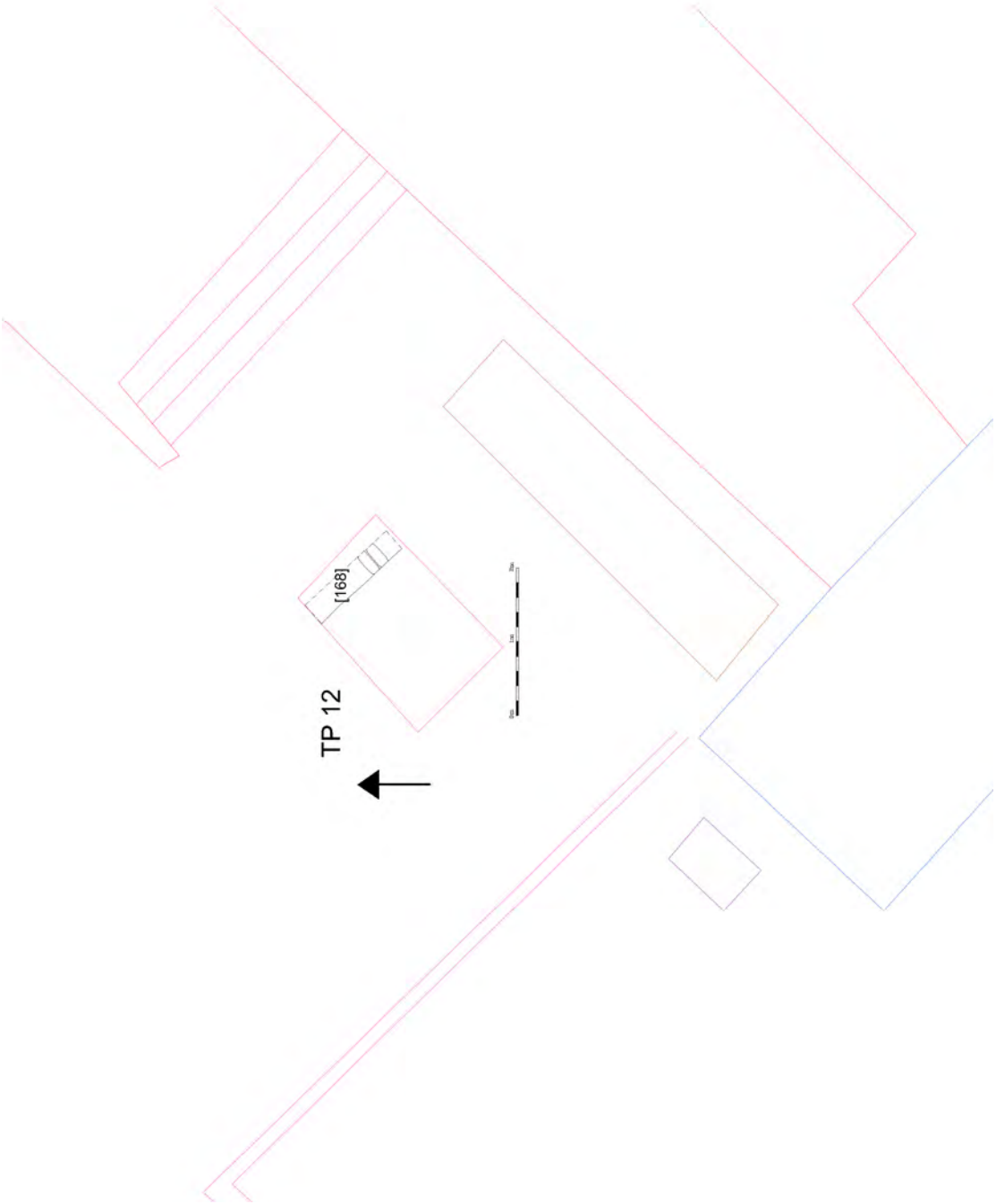


Figure 55. Plan of wall [168] in Test Pit 12

Summary:

The depths of test pits ranged between 0.45m deep and 3m deep. The shallower test pits were generally where stone temple architecture was

reached high up meaning that excavation was interrupted and had to be halted.

- The Temple Wall

Three test pits were excavated against the inner enclosure wall of the temple (Test Pits 3-2, 8, 11). The wall against which Test Pit 3.2 was excavated bounds the Roman forecourt which was probably built after the Temple proper (Arnold 1999). We encountered the base of wall foundation stones in Test Pit 3-2 at 94.51m asl and in Test Pit 8 at 94.71m asl. In Test Pit 3-2 the wall (possibly foundation) was stepped, the stones appeared well faced apart from the lowest course, possibly suggesting that it was only the lowest course that acted as foundation and the stepped part of the wall was visible above ground. The foundation stone course was trench built, cut through and sealing a silty sand deposit. A sequence of deposits then respected the northwest face of the wall. Above these we recorded a mudbrick wall abutting the temple wall, the foundation of which was at 96.21m asl. This wall possibly relates to the later occupation of the Open Court.

The sequence in Test Pit 8 was slightly different. The foundation of the temple wall was built directly upon red powder interpreted as crumbled burnt mudbrick. The temple wall was founded at level 94.71m asl, at exactly the same level as the wall to the southwest (Test Pit 3-2). Then, a 1.66m thick deposit containing frequent mudbricks, including burnt pieces, and late Roman Period pottery had been dumped against the foundation courses of the temple wall. In neither Test Pits was a clear floor surface observed.

In Test Pit 11 the base of the original temple wall was not encountered. Instead, a modern cut was observed against the southeast face of the modern mudbrick wall, cut down to create a modern stone foundation.

- The Open Court

Test Pits 2, 6 and 7 were excavated within the Open Court (as well as Test Pits 3-2 and 8 discussed above). No floors that clearly related to the Open Court were encountered. In Test Pit 7 the ‘Crocodile Basin’ appeared to be

built over (and slightly cut through) the same red powder (burnt mudbrick) that was observed in Test Pit 8 (see above). This was recorded at 95.65m asl. Just as with Test Pit 8, a deposit containing frequent mudbricks (including burnt brick) had been dumped against the face of the wall up to a elevation 96.38m asl.

The sequence in Test Pit 6 was unclear within such a limited exposure. The deposits here may all be modern. Alternatively, modern restoration cuts within the area of this test pit may have removed the original foundation cut for the Nilometer.

The sequence in Test Pit 2 showed that the wall of the Birth House was founded at 94.93m asl, and clearly demonstrated that this structure truncated an earlier mudbrick building. The substantial size of this earlier structure may suggest that it was some sort of enclosure wall, possibly predating the creation of the Open Court. A later mudbrick wall (post-dating the construction of the Birth House must relate to later occupation in the Open Court. Just as with Test Pit 3-2, there were no signs of the burnt horizon that was found in Test Pits 7 and 8.

- In front of the Temple

Test Pit 1 was the most southwesterly test pit excavated. Here it was clear that the original Nilometer wall had been entirely removed. A sequence of deposits, possibly modern make-up layers, had been dumped and part of the Nilometer wall had been re-constructed.

Test Pit 5 was excavated against the South Gate. The wall of the gate had been trench-built through a 1.72m thick deposit containing mudbricks (including burnt mudbricks), possibly the same horizon recorded to the northwest of the temple (variously as red powder or burnt mudbricks). A similar but ashy deposit had then been dumped against the wall. Above this, at 95.51m asl, indications were found of the modern restoration works that had clearly occurred to the wall.

A little way to the northwest, in Test Pit 12, there were no clear signs of the burnt horizon. A mudbrick wall was recorded at an extremely low level, 93.68m asl, which appears to have been dismantled or had collapsed naturally. The fine sand sealing this may relate to a period of abandonment. This was sealed by a thick deposit containing un-burnt mudbricks which made up the ground level to 95.43m asl. According to the ceramic material, this deposit was laid within the Ptolemaic Period. This formed the foundation for a later mudbrick wall which may relate to the use of the Ptolemaic Temple belong to later Roman modifications.

14.1 Kom Ombo: Preliminary Ceramics Report

Mohamed Naguib

The Kom Ombo GWL Project recovered pottery finds from Well 1 (PMT) and seven tests pits (TP). All the pottery is in fragments; no complete vessels were found. The GWL Project excavated pottery dating to four historical periods: Old Kingdom, Ptolemaic, Roman and late Roman. The Old Kingdom material came from the pumping test and represents typical Old Kingdom shapes of 'beer jars', bread molds and carinated 'Meidum-ware' bowls. The Ptolemaic period material recovered from test pit 12 comprised two handled jars, a ring base carinated bowl and censer beakers that seem to have been used as indicated by traces of smoke on the inner surfaces. The Roman and late Roman sherds came from the other test pits. These represent containers for wine (amphorae), red coated Aswan wares (dishes, bowls and cups) and some Nile clay coarse wares (large bowls and storage jars). Late Roman Amphora 7 is the most common type among these finds followed by the Aswan amphorae. A large amount of the late Roman material exhibits worn surfaces and many are covered with soot. A few sherds have been burnt on the interior and exterior. This may indicate daily fire activities at the site during the late Roman Period and may be from cooking food and heating drinks.

Well 1 (PMT)

The pumping test pottery dates from the Old kingdom and comprises rim sherds and parts of bodies and bases of 'beer jars', bread molds and one rim sherd of a carinated 'Meidum-ware' bowl. Amongst this group was one late Roman body sherd which should be understood as 'contamination' within an otherwise Old Kingdom assemblage.

<u>Beer jars</u>

The beer jar assemblage recovered from well 1 comprises rims, parts of walls and parts of bases. The jars are made of coarse Nile clay fabric and are hand shaped. The average rim diameter is 8.0cm; the exterior and interior surfaces are very rough. The sherds are from vessels resembling Old Kingdom beer

jars or the traditional offering jars, Reisner's type A-IV which "has a long history, extending from the Late Pre-dynastic period to the Middle Kingdom."[8] They are made by hand shaping from coarse Nile clay without care to the shape and symmetry of the vessel.[9]

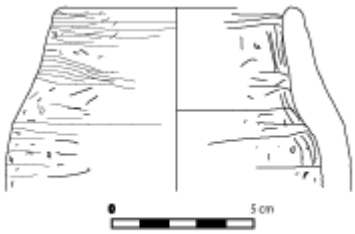
Barta's remarks about interpretation of Old Kingdom beer jars[10] concentrate on "the production technique, jar dimensions, liquid volume capacity and their meaning". Despite the incompleteness of our PMT jars it is still possible to apply some of Barta's observations. The PMT jars agree with the definition of the Old Kingdom production of beer jars regarding the building up of the vessel from different parts and the roughness of the exterior surface.[11] Regarding the dimensions of the Old Kingdom beer jars, particularly the considerable development concerning the increase in height towards the end of the Old Kingdom, it is difficult to use this criterion to date the PMT beer jars.[12]

Rzeuska's divisions for the late Old Kingdom pottery from Saqqara regarding beer jars are in four phases.[13] She mentions that form 1, from phase 1, distinguished by a thick bottom, is a characteristic for beer jars from the 4th and 5th dynasties.[14] This can be seen in examples from Abou Rawash,[15] Abusir,[16] and Giza.[17] This note, typical for the parts of base sherds from well 1, is represented in the drawn sherd PMT 17, indicating a date for this piece and the other beer jars of the 4th – 5th Dynasties.

PMT 1 is a rim of a beer jar. The height is 6.5 cm, the diameter is 8 cm and the percentage of the vessel rim represented is 10%. The jar is made of

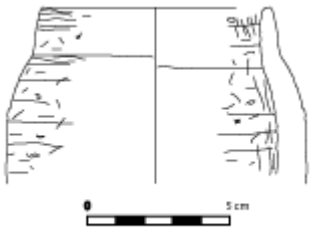
[8] Reisner, 1931, p. 212
[9] Rzeuska, 2006, p. 291.
[10] Barta, 1996a, p. 127
[11] Barta, 1996a, pp. 127-8
[12] Barta, 1996a, p. 128
[13] Rzeuska, 2006, p.382, table 1.
[14] Rzeuska, 2006, p.386
[15] Baud et al, 2003, 19 , fig. 15: 35
[16] Arias, p. 87 fig. 3.3.2, type J-1a
[17] Wodzińska, 2009, p. 232, fig. 5

coarse Nile clay fabric and is handmade. The exterior and the interior surfaces are untreated.



PMT 1

PMT 2 is a rim of a beer jar. The height is 6.3cm, the diameter 8 cm and the percentage of the vessel rim represented is 6%. The jar is made of coarse Nile clay fabric and is handmade. The exterior and the interior surfaces are untreated.

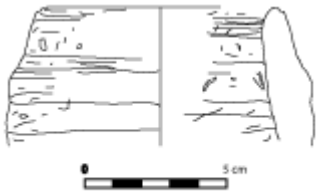


PMT 2

PMT 9 is a rim of a bear jar. The height is 9.3cm, the diameter 8.0cm and the percentage of the vessel rim represented is 25 %. The jar is made of coarse Nile clay fabric and is handmade. The exterior and the interior surfaces are untreated.

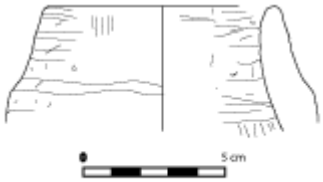
PMT 9

PMT 10 is a rim of beer jar. The height is 4.8cm, the diameter 8.0cm and the percentage of the vessel rim represented is 25%. The jar is made of coarse Nile clay fabric and is handmade. The exterior and the interior surfaces are untreated.



PMT 10

PMT 16 is a rim of a beer jar. The height is 4.4cm, the diameter 8.0cm and the percentage of the vessel rim represented is 20%. The jar is made of coarse Nile clay fabric and is handmade. The exterior and the interior surfaces are untreated.



PMT 16

PMT 17 is a wall and part of base of beer jar. The height is 13.3cm, the wall diameter 10.0cm and the percentage of the vessel rim represented is 30%. The jar is made of coarse Nile clay fabric and is handmade. The exterior and the interior surfaces are untreated.

PMT 17

Bread Molds

The bread mold sherds discovered from well 1 represent parts of bodies and rims. Five rim sherds represent the upper parts of the molds. Three of them have a rim diameter 22.0cm and two sherds have diameters of 22.0 – 28.0cm and 28.0 – 30.0(?)cm. Three rim sherds are made of coarse Nile clay fabric and the two other sherds are made of medium fine and medium coarse Nile

clay. The exterior and interior surfaces are smoothed. The bread mold body sherds recovered from the well have a thickness from 1.0cm to 5.0cm. They are made from medium fine, medium coarse and coarse Nile clay fabrics. Their exterior surfaces are rough and the interior surfaces are smoothed. The bread molds from well 1 were formed by molding over a core and have the characteristic conical shape of the Old Kingdom (*bedja* pots).[18]

The change in shape during the Archaic Period and the Old Kingdom took the form of an increasingly flat shaped base, a continuing decrease in width and more height.[19] With the absence of a complete bread mold from well 1, the careless hand shaping and the remaining percentage of the rim sherds, we cannot follow the development of these bread molds from their dimensions and heights so to date the bread mold sherds from well 1 we will concentrate on the shape of the lower body and base sherds.

In reviewing the shape of bases or the lower parts of Old Kingdom bread molds, we find that those with conical bases remained in use at Giza until the second half of the 5th dynasty and at Sedment from the 6th - 10th Dynasty[20] and here "flat bases appear alongside oval ones".[21] The same situation also can be seen in the Raneferef temple at Abusir[22] where both shapes were found alongside one another and date to the 5th Dynasty. The *bedja* flat bases gradually increase and become common in the 6th Dynasty.[23] Thus there is a possibility that the oval base bread molds appeared in the 5th Dynasty as a transitional stage between the conical shaped and the flatter bread molds.

Despite the above observations regarding the development of the base shape during the Old Kingdom, we should observe a characteristic mark on the body of some Old Kingdom bread molds such as a ledge or a pronounced part on walls when a complete shape for a base is absent. This ledge was formed by adding a lump of clay to the lower part of the vessel. It allowed the bakers to

[18] El-Senussi, 2008, p. 169
[19] Gordon,1981, p.12. Patricia, 1997, fig. 14a
[20] Gordon, 1981, p.14
[21] Reisner, 1932, p. 85 Fig. 36, 9
[22] Bárta, 1996b, p.153
[23] Rzeuska, 2006, p. 419

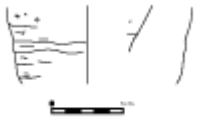
stack the vessels in layers in the ovens. This feature is found on the walls of PMT 3 and PMT 13. In reviewing this ledged feature of Old Kingdom bread molds, we find it to be a characteristic of the conical bread molds of the 5th Dynasty at Abu-Gorab[24] and the 4th dynasty at Dahshur,[25] Giza,[26] al-Shaykh Sa'id,[27] and Elephantine.[28] The feature is not found on the flat-based bread molds of the 6th Dynasty at Saqqara.[29]

Walls of bread molds

PMT 3 is a sherd from the wall and part of the base of a bread mold. The height is 10.8cm, the wall diameter in its highest point 24.0cm and the percentage of the vessel represented is 10%. The pot is made of medium fine Nile clay fabric and shaped on a mold. The exterior surface is untreated and rough and the interior surface smoothed.

PMT 3

PMT 7 is a sherd from the wall and part of the base of a bread mold. The height is 5.4cm, the wall diameter 12.0cm and the percentage of the vessel represented is 8%. The pot is made of medium coarse Nile clay fabric and shaped on a mold. The exterior surface is untreated and rough and the interior surface smoothed.

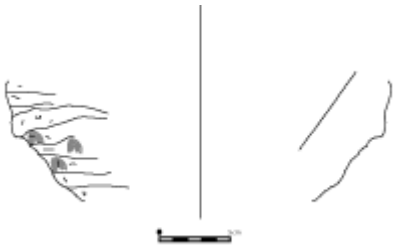


PMT 7

PMT 13 is a sherd from the wall of bread mold. The height is 9.7cm, the wall diameter above ledge 24.0-28.0cm and the percentage of the vessel represented is 12%. The pot is made of coarse Nile clay fabric and shaped on

[24] Kaiser, 1969, p. 77, LIV: 258
[25] Falting1989, Abb.3-C senfru
[26] Wodzinska 2009, p. 235 fig. 14
[27] Willems et al, 2009, p. 312 fig. 11a
[28] Raue 1999, p. 179-180 Abb 36.9
[29] Rzeuska, 2006, PL. 143-50

a mold. The exterior surface is worn and smoked and the interior surface smoothed.



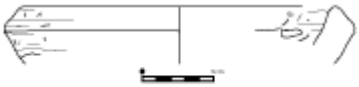
PMT 13

Rims of bread molds

PMT 11 is a sherd from the rim of bread mold. The height is 7.0cm, the diameter 22.0cm and the percentage of the vessel rim represented is 1%. The pot is made of medium fine Nile clay fabric and shaped on a mold. The exterior and interior surfaces are smoothed.

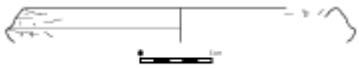
PMT 11

PMT 12 is a sherd from the rim of a bread mold. The height is 4.0cm, the diameter 22.0-28.0cm and the percentage of the vessel rim represented is 12%. The pot is made of medium coarse micaceous Nile clay fabric and shaped on a mold. The exterior and interior surfaces are smoothed.



PMT 12

PMT 14 is a sherd from the rim of a bread mold. The height is 2.3cm, the diameter (28.0-30.0cm?) and the percentage of the vessel rim represented is 3%. The pot is made of coarse Nile clay fabric and shaped on a mold. The exterior and interior surfaces are smoothed.



PMT 14

PMT 18 is a sherd from the rim of a bread mold. The height is 6.7cm, the diameter 22.0cm and the percentage of the vessel rim represented is 10%. The pot is made of medium coarse Nile clay fabric and shaped on a mold. The exterior and interior surfaces are smoothed.

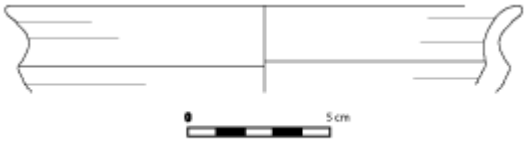
PMT 18

PMT 19 is a sherd from the rim of a bread mold. The height is 4.8cm, the diameter 22.0cm and the percentage of the vessel rim represented is 7%. The pot is made of medium coarse Nile clay fabric and shaped on a mold. The exterior and the interior surfaces are smoothed.

PMT 19

<u>‘Meidum-ware’ Bowl</u>

PMT 15 is a rim sherd of a carinated bowl. The height is 3.0cm, the diameter 17.0-18.0cm and the percentage of the vessel rim represented is 3%. The bowl is made of marl clay fabric and shaped either in a mold or possibly on a wheel. The exterior and the interior surfaces are worn.



PMT 15

Date: Old Kingdom

<u>Test Pits Pottery</u>

The Kom Ombo ground water lowering project (GWLP), retrieved ceramic material from eleven features - from 7 Test Pits (TP): TP 3-F#158, TP 5-F# 110, TP 5-F#111, TP 6-F#127, TP 6-F#128 (2015-1006), TP 6-F#128(2015-1007), TP 7-F#135, TP 8-F#146, TP 10-F#148, TP 11-F#179, TP11-F#180, TP 12-F# 167.

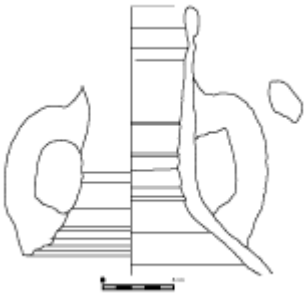
<u>TP 3 pottery</u>

TP 3-F#158

Sherds of amphorae were recovered.

Date: Late Roman Period

TP 3-158-1 is a broken neck and shoulder of an amphora with two handles still attached. The height is 16.5cm, rim diameter 10.0cm and the percentage of the vessel represented is 8%. The amphora is made of a fine Nile clay fabric and wheel turned. The exterior surface is ribbed; the interior surface covered with black bitumen.



TP 3-158-1

Parallel: (LRA 7) Lauffray, 1995, p. 98 Fig. 48:247

Date: Late Roman Period

TP 5 pottery

The pottery finds were recovered from two features F#110 and F#111.

TP 5-F#110

The pottery finds from this feature are few, comprising a base and body sherds of late Roman amphora 7, an Aswan red slip bowl, a very short stand and a black topped neck of jar.

Date: late Roman period

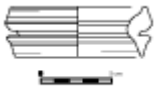
TP 5-110-1 is a twisted base of an amphora. The height is 11.5 cm. The base is made of fine Nile clay fabric attached by twisting it to the body on wheel. The exterior surface is worn; the interior surface is covered with black bitumen.

TP 5-110-1

Parallel: Late Roman Amphora 7

Date: late Roman Period

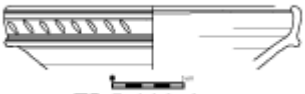
TP 5-110-2 is a sherd from a very short stand; the height is 3.5cm, the upper part (rim) diameter 8.0cm and the lower part (base) diameter 9.0cm. The stand is made of Aswan clay and wheel turned. The exterior and the interior surfaces are slipped.



TP 5-110-2

Date: late Roman period

TP 5-110-4 is a rim sherd of a bowl with painted and incised decoration running over the exterior surface. The height is 4.5cm, rim diameter 20.0cm and the percentage of the vessel rim represented is 7%. The bowl is made of Aswan clay and wheel turned. The decoration is in black. The exterior surface is slipped; the interior surface is smoothed and slipped. The area between the rim and the collar ledge is covered with soot that may indicate use as a lid.



TP 5-110-4

Parallel: Gempeler, 1992, p.95-6, T323a Abb. 38, Nr 8-10
Date: 5th -7th Cent. AD

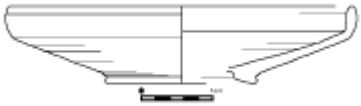
TP 5-F#111

The sherds recovered from this feature are fragments of Aswan red slipped dishes, an imported dish and body sherds of Aswan amphorae
Date: late Ptolemaic – early Roman Period
TP 5-111-2 is a ring base of an imported dish. The height is 1.5cm, base diameter is 8.0cm and the percentage represented is 10%. The dish is possibly in a Greek fabric and was wheel turned. The exterior and the interior surfaces are worn with traces of slip.

TP 5-111-2

Date: Ptolemaic-Roman period

TP 5-111-3 is a rim sherd and part of the base of a bowl. The height is 5.5 cm, rim diameter 24 cm and the percentage of the vessel rim represented is 20%. The bowl is made of Aswan clay and is wheel turned. The exterior surface is slipped; the interior surface is smoothed and slipped. The bowl is heavily sooted outside and towards the rim inside.



TP 5-111-3

Parallel: Ballet, 2001, pp.115, 138- fig. 29

Date: late Ptolemaic period

TP 6 pottery

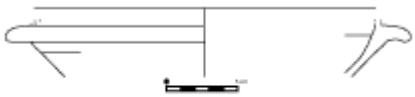
Sherds were recovered from three features: F#127, F# 128 and F# 135.

TP 6 F#127

The pottery finds recovered from TP 6 are seven bases of Late Roman Amphora 7, body sherds of LRA7, a broken handle of a late Roman Aswan amphora, a late Roman Aswan red slipped bowl, two diagnostic sherds of coarse Nile clay bowls one of which has interior decoration, and a coarse Nile clay two-handled jar with ribbed body.

Date: late Roman period

TP 6-127-6 is a burnt wall sherd of a collar-ledge bowl. The height is 4.0cm, the wall diameter 28.0cm, the exterior and interior surfaces are very worn and burnt which may indicate its presence in a firing after it was broken.



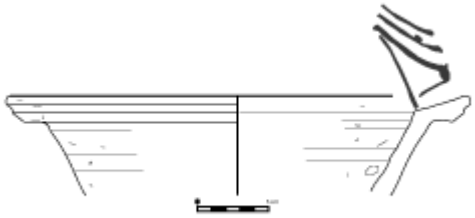
TP 6-127-6

Parallel: Bailey, 1998, pl.12, C377

Date: late Roman period (7th-8th cent. AD)

TP 6-127-7 is a sherd from an everted collar rim of a large basin or bowl with painted decoration running over its interior surface. The height is 7.0cm, rim

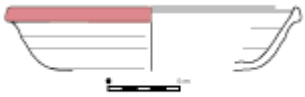
diameter 30.0-32.0cm and the percentage of the vessel rim is 10%. The bowl is made of a coarse Nile clay fabric and is wheel turned. The exterior and the interior surfaces are coated. The painted decoration is in black on a whitish background. The bowl is covered with soot on the interior.



TP 6-127-7

Parallel: Bailey, 1998, p. 93, close in shape to K21-22 pl. 55.
Date: late Roman period

TP 6-127-8 is a rim sherd of a bowl with a red band running over it. The height is 4.5cm, rim diameter 20.0cm and the percentage of the rim is 14%. The bowl is made of Aswan clay fabric and wheel turned. The exterior and the interior surfaces are smoothed and slipped.



TP 6-127-8

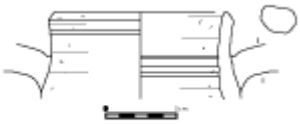
Date: late Roman period

TP 6-127-11 is a broken base sherd of an amphora. The height is 12.0cm, made of medium fine Nile clay fabric and was attached to the vessel by twisting it to the body using a wheel. The exterior surface is untreated and the interior surface covered with bitumen.

TP 6-127-11

Parallel: LRA7
Date: late Roman period

TP 6-127-12 is a rim sherd of a two handled jar. The height is 6.5cm, rim diameter 12.0cm and the percentage of the rim is 15%. It is made of coarse Nile clay fabric and wheel turned. The exterior surface is white washed and the interior surface untreated.



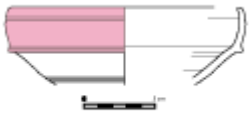
TP 6-127-12

Date: late Roman Period

TP 6-F#128

The pottery recovered from this test pit comprises 2 bases of Egyptian Roman period amphorae, 14 base sherds (most broken and worn) of LRA7, broken handles of Late Roman Aswan amphorae, fragments of neck and handles of Roman Aswan amphorae, a handle of an imported amphora, rims and bases of Aswan red slipped bowls and dishes, ring bases of coarse Nile clay large storage jars, two rims of coarse Nile clay large bowls, 3 bases of Late Roman cups (like TP 11-179-2), a broken ladle and body sherds of Nile and Aswan fabrics. Some sherds are burnt or sooted inside and out.
Assemblage date: Roman to late Roman Period

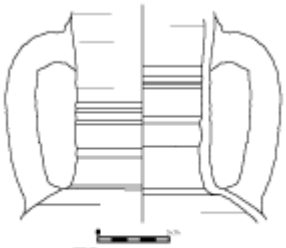
TP 6-128-2 is a rim sherd of a bowl with painted decoration running over its exterior surface between the ledge and rim. The height is 5.5cm, rim diameter 16.0 cm and the percentage of the rim is 7%. The bowl is made of Aswan clay fabric and wheel turned. The exterior surface is slipped and the interior surface smoothed and slipped. The painted decoration is one broad band in red.



TP 6-128-2

Date: late Roman period

TP 6-128-6 is a handle and part of the neck of an amphora. The height is 15.5cm, the neck diameter 12.0cm and the percentage of the vessel is 10%. The amphora is made of Aswan clay fabric and wheel turned. The exterior surface is smoothed and the interior surface untreated.



TP 6-128-6

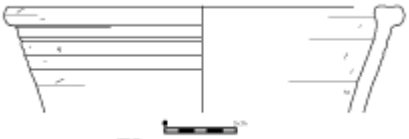
Parallel: Gempeler, 1992, p.189, Abb. 120, No. 5. Ballet & Vichy, 1992, figs. 10-11.

Date: Roman period; 1st – 3rd cent. AD.

TP 6-128-10 is a handle, full length preserved, of an imported amphora. The height is 14.0cm with an oval section. The handle is made of a medium tempered marl fabric.

TP 6-128-10

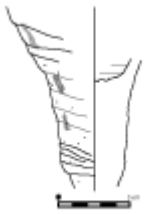
TP 6-128-12 is a rim sherd of a bowl. The height is 7.5cm, the rim diameter 26.0cm and the percentage of the rim is 8%. The bowl is made of medium coarse Nile clay fabric and wheel turned. The exterior and the interior surfaces are coated in red.



TP 6-128-12

Date: late Roman period

TP 6-128-19 is a broken base of an amphora. The height is 13.0cm. It is made of Nile clay fabric (the fabric of the base is coarser than the fabric of the body) and wheel turned. The exterior surface is untreated and the interior surface covered with bitumen.



TP 6-128-19

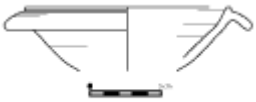
Parallel: (LRA7) Ballet et al, 1991, p.137, fig. 12
Date: late Roman Period

TP 6-128-23 is a knobbed base of an amphora. The height is 8.8cm. It is made of Nile clay fabric and wheel turned. The exterior surface is untreated and the interior surface covered with bitumen.

TP 6-128-23

Date: late Roman Period

TP 6-128-33 is a rim sherd of a bowl with a black band running over it and a ledge collar. The height is 4.5cm, the rim diameter 10.0cm and the percentage of the rim is 10%. The bowl is made of Aswan clay fabric and wheel turned. The exterior and interior surfaces are smoothed and coated.

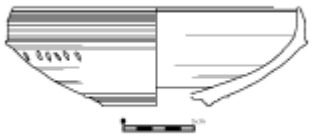


TP 6-128-33

Parallel: Bailey, 1998, p. 23, pl. 12-C367
Date: late Roman period

TP 6-128-37 is a rim sherd of a bowl with bands of decoration running over body. The height is 7.0cm, the rim diameter 20.0cm and the percentage 20 %.

The bowl is made of Aswan clay fabric and wheel turned. The exterior and interior surfaces are very worn. The decoration was carried out by incision.



TP 6-128-37

Parallel: Gempeler, 1992, p. 95-6, T323a Abb. 38, 8-10
Date: 5th -7th cents. AD

TP 6-128-38 is a ring base sherd of a storage jar. The height is 8.6cm, the rim diameter 16.0cm and the percentage of the vessel is 25%. The bowl is made of Aswan clay fabric and wheel turned. The exterior surface is smoothed and coated; the interior surface is untreated.

TP 6-128-38

Date: late Roman period

TP 6-128-44 is a base of an amphora. The height is 7.0cm. It is made of Nile clay fabric and wheel turned. The exterior surface is untreated.

TP 6-128-44

TP 6-128-46 is a rim and handle of a scoop or ladle. The height is 3.7cm, the rim diameter 9.0cm and the percentage of the rim is 12%. The bowl is made of medium coarse clay fabric and wheel turned. The exterior and interior surfaces are smoothed and coated.

TP 6-128-46

Parallel: Gempeler, 1992, pp. 206-7, Abb.132, 8 (S 15), 9 (S16)
Date: 4th – 5th cents. AD
TP 6-128-48 is a base of an amphora. The height is 11.5cm. It is made of Nile clay fabric and wheel turned. The exterior surface is untreated.

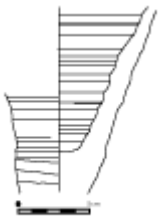
TP 6-128-48

Date: Roman period

TP 7-F#135

This test pit contains broken sherds of LRA7 (7 bases), fragments of necks, handles and bases of late Roman Aswan amphorae, a rim sherd of a Nile clay cooking pot (its exterior surface covered with soot), and a ring base of an Aswan yellow slipped dish.
Assemblage date: late Roman Period

TP 7-135-1 is a broken base of an amphora. The height is 13 cm. It is made of Nile clay fabric and wheel turned. The exterior surface is worn and the interior surface covered with bitumen.



TP 6-135-1

Parallel: Marchand & Deneuve, 2007, p. 332, fig. 15
Date: late roman period

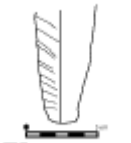
TP 7-135-2 is a base of an amphora. The height is 9.0cm, the base diameter is 4.5 cm – 5.0cm. It is made of Nile clay fabric and wheel turned. The exterior surface is worn and the interior surface is untreated.

TP 6-135-2

Parallel: LRA7

Date: late Roman period

TP 7-135-3 is a base of an amphora. The height is 8.0cm. It is made of Nile clay fabric and wheel turned. The exterior surface is worn and the interior surface is untreated.



TP 6-135-3

Date: Roman period

TP 7-135-6 is a base of an amphora. The height is 4.5cm, the base diameter 3.4cm and the percentage preserved is 100%. The amphora is made of Aswan clay fabric and wheel turned. The exterior and the interior surfaces are untreated.

TP 6- 135-6

Parallel: Aston, 2007, 430-1, fig. 9 group III

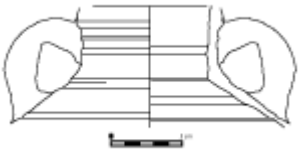
Date: 6th – 8th cent. AD.

TP 7-135-11 is a rim of a cooking pot with knobbed handles. The height is 5.9cm, the rim diameter 16.0cm and the percentage preserved is 12%. The jar is made of medium fine Nile clay fabric and wheel turned. The exterior and interior surfaces are untreated. There is a trace of soot on the exterior surface.

TP 6-135-11

Parallel: Gempeler, 1992, p.128, K380, Abb. 98, 10
Date: 5th – 6th cent. AD.

TP 7-135-12 is a neck with handle of an amphora. The height is 8.5cm, the neck diameter is 10cm and the percentage preserved is 30%. The amphora is made of Aswan clay fabric and wheel turned. The exterior surface is worn and the interior surface is untreated.



Tp 6-135-12

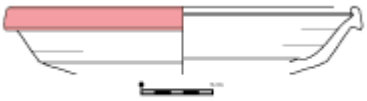
Parallel: Gempeler, 1992, p.198, Abb. 123, Nr 4, K718, Abb.123, Nr 8, K720
Date: 6th – 7th cent. AD.

TP 8 pottery

TP 8-F#146

This test pit contained a body sherd of LRA7, two ring bases of storage jars made in Nile clay (one of them burnt inside and out), two ring bases of Aswan dishes, four rims of Aswan red slipped bowls and dishes, a base of an Aswan cup (like TP 11-179-2), a base of a *saqia* pot, rims of coarse Nile clay bowls and a rim sherd of a two-handled large bowl of Aswan clay.
Assemblage date: late Roman period

TP 8-146-1 is a rim of a bowl with a red band running over the rim. The height is 4.8cm, the rim diameter is 24.0cm and the percentage preserved is 16%. The bowl is made of Aswan clay fabric and wheel turned. The exterior surface is coated and interior surface is smoothed and coated.



TP 8-146-1

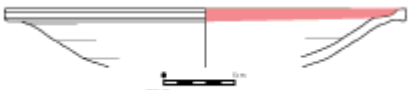
Parallel: Bailey, 1998, p. 19, pl.10 C 270-3
Date: late Roman Period

TP 8-146-4 is a rim sherd of a bowl with round handles. The bowl has painted black bands of decoration running over the rim and partly on the body, and two vertical incised lines on the outside of the rim. The height is 5.5cm, the rim diameter 30.0-32.0cm and the percentage preserved is 15%. The bowl is made of Aswan clay fabric and wheel turned. The exterior and interior surfaces are worn.

TP 8-146-4

Date: late Roman period

TP 8-146-6 is a rim sherd of a dish with a red band running over the rim. The height is 4.2cm, the rim diameter is 28.0cm and the percentage preserved is 8%. The dish is made of Aswan clay fabric and wheel turned. The exterior surface is coated and interior surface is smoothed and slipped.



TP 8-146-6

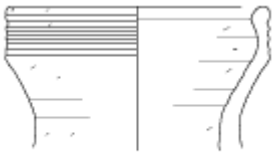
Date: late Roman period

TP 8-146-8 is a rim sherd of a wavy rimmed bowl with red painted decoration running over it. The height is 3.4cm, the rim diameter is 34.0-36.0cm and the percentage preserved is 8%. The bowl is made of coarse Nile clay fabric and wheel turned. The exterior surface has soot on it and the interior surface is white washed.

TP 8-146-8

Parallel: Egloff, 1977, pl. 76, type 264 (3)
Date: late Roman Period

TP 8-146-12 is a rim sherd of a bowl. The height is 10.2cm, the rim diameter is 18.0cm and the percentage preserved is 15%. The bowl is made of coarse Nile clay fabric and wheel turned. The exterior and interior surfaces are coated.



TP 8-146-12

TP 8-146-15 is a knob base of a *qadus* (*saqia* pot). The height is 2.5cm. It is made of Nile clay fabric and wheel-turned. The exterior surface is smoothed and the interior surface untreated.

TP 8-146-15

Parallel: Gempeler, 1992, p. 208, Abb.133, 6-S23
Date: 5th-7th cent. AD

<u>TP 10 pottery</u>

<u>TP 10-F#148</u>

This test pit contains body sherds of Late Roman Amphora 7, a rim sherd of an Egyptian Roman period amphora, a ring base and a rim of a Roman Aswan amphora.
Assemblage date: Mid-Roman to Late Roman period

TP 10149-2+3 is a ring base of an amphora. The height is 6.0cm, the diameter 5.0cm and the percentage preserved is 50%. The base is made of Aswan clay fabric and is wheel turned. The exterior and interior surfaces are untreated.

TP 10-149-2+3

Parallels: Gempeler, 1992, p. 189, Abb. 120, 5- K703 & Ballet &Vichy, 1992, p. 115 fig.10b.
Date: 1st-3rd cent. AD

TP 10-149-5 is a rim of an amphora. The height is 9.4cm, the diameter 10.0cm and the percentage preserved is 10%. The rim is made of Nile clay fabric and is wheel turned. The exterior and interior surfaces are untreated.

TP 10-149-5

Parallel: Marquie, 2007, p. 106, Fig. 27. Marchand, 2007, p. 186: Fig. 9.
Date: 1st -3rd C. AD

TP 10-149-6 is a rim of an amphora. The height is 11.6cm, the diameter 10.0cm and the percentage preserved is 12%. The rim is made of Aswan clay fabric and is wheel turned. The exterior and interior surfaces are untreated. The neck has a hole drilled after firing to allow fermentation gasses to escape.

TP 10-149-6

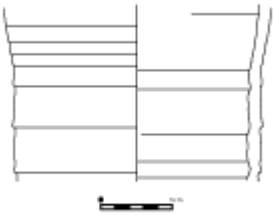
Parallel: Gempeler, 1992, p. 189, Abb. 120, 5- K703 & Ballet and Vichy, 1992, p. 115, Fig. 10a.
Date: 1st – 3rd cent. AD

<u>TP 11 pottery</u>

<u>TP 11-F#179</u>

This test pit contains body sherds of LRA7, a body sherd of LRA1, a rim of an amphora and a base of a cup.
Assemblage date: late Roman period.

TP 11-179-1 is a wall sherd of an amphora. The wall diameter is 26.0cm and the percentage preserved is 18%. It is made of imported fabric (LRA1) and wheel turned. The exterior and the interior surfaces are untreated.



TP 11-179-1

Parallel: (LRA1) Peacock & Williams, 1991, p. 185-187. Class 44
Date: late Roman period

This type of amphora is found in great quantity in Egypt. Its manufacturing date range is from the last quarter of the 5th century AD to the end of the first quarter of the 7th century. Because of its durability vessels were probably re-used and probably remained in circulation throughout the 7th century. Late Roman Amphora 1 (LRA 1) originated from Cilicia, Anatolia and/or Cyprus.

TP 11-179-2 is a string cut base of a cup. The height is 3.6cm, the diameter is 4.0cm and the percentage preserved is 100%. The base is made of Aswan clay fabric and is wheel turned. The exterior and interior surfaces are untreated.

TP11-179-2

Parallel: Gempeler, 1992, p.128, T624a Abb. 73, 7-9
Date: middle of 6th cent. – 7th cent. AD.

TP 11-179-4 is a rim sherd of a jar or amphora. The height is 10.0cm, the diameter is 12.0cm and the percentage preserved is 15%. The rim is made of marl clay fabric and is wheel turned. The exterior and interior surfaces are untreated.

TP 11-179-4

TP11-F#180

This test pit contained one base and a body sherd of LRA7, rims of Aswan red slipped bowls and dishes, a rim sherd of a coarse Nile clay storage jar, a rim of a cooking pot and the base of a cup.

Assemblage date: late Roman period

TP 11-180-1 is a rim of a large jar. The height is 7.5cm, the diameter is 18.0cm and the percentage preserved is 18%. The base is made of medium coarse Nile clay fabric and is wheel turned. The exterior surface is coated and interior surface is untreated.

TP 11-180-1

TP 11-180-2 is a rim of a bowl. The height is 4.0cm, the diameter is 14.0cm and the percentage preserved is 10%. The rim is made of Aswan clay fabric and is wheel turned. The exterior and interior surfaces are smoothed and slipped.

TP 11-180-2

Date: late Roman period

TP 11-180-5 is a rim of a cooking pot. The height is 4.9cm, the diameter is 11.0cm and the percentage 12%. The rim is made of medium fine Nile clay fabric and is wheel turned. The exterior and interior surfaces are sooted.

TP 11-180-5

TP 12 pottery

TP 12-F# 167

This test pit contained bases of three censer beakers, the rim of a two handled storage jar, a rim of a cooking pot, a rim sherd of a jar and ring bases of Nile clay bowls.

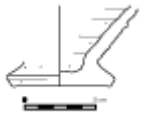
Assemblage date: Ptolemaic period

TP 12-167-1 is a rim sherd of a storage jar. The height is 6.7cm, the diameter 10.0cm and the percentage preserved is 22%. The jar is made of medium coarse Nile clay fabric and is wheel turned. The exterior surface is washed (scum). The interior surface is divided into two zones; the upper part towards the rim is washed while below this the rest is untreated.

TP 12-167-1

Date: Ptolemaic period

TP 12-167-2 is a string cut base of beaker. The height is 5.5cm, the base diameter is 7.0cm and the percentage preserved is 50%. The beaker is made of medium coarse Nile clay fabric and is wheel turned. The exterior and the interior surfaces are untreated.



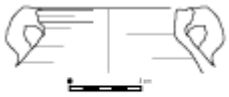
TP 12-167-2

Parallel: Aston, 1999, pp. 334-5, pl. 115:3033

Date: late 3rd - 2nd cent. BC.

TP 12-167-4 is a rim sherd of a jar or cooking pot. The height is 4.8cm, the rim diameter 9.0cm and the percentage preserved is 25%. The jar is made of

medium coarse Nile clay fabric and is wheel turned. The exterior surface is smoothed and the interior surface is untreated. A trace of soot is on the exterior surface.



TP 12-167-4

TP 12-167-5 is a string cut base of a beaker. The height is 4.6cm, the base diameter is 5.0 to 5.5cm and the percentage preserved is 90%. The beaker is made of medium coarse Nile clay fabric and is wheel turned. The exterior and the interior surfaces are untreated. A trace of soot is inside.

TP 12-167-5

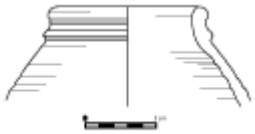
Parallel: Aston, 1999, pp. 334-5, pl. 112:2965
Date: late 3rd - 2nd cent. BC.

TP 12-167-8+3 is a rim sherd with part of a base of a bowl. The height is 6.2cm, the base diameter is 6.0cm and the percentage preserved is 90%; the rim diameter is 18.0cm and the percentage preserved is 10%. The bowl is made of medium coarse Nile clay fabric and is wheel turned while the ring-base was made by attaching a coil of clay. The exterior and the interior surfaces are smoothed and slipped.

TP 12-176-3+8

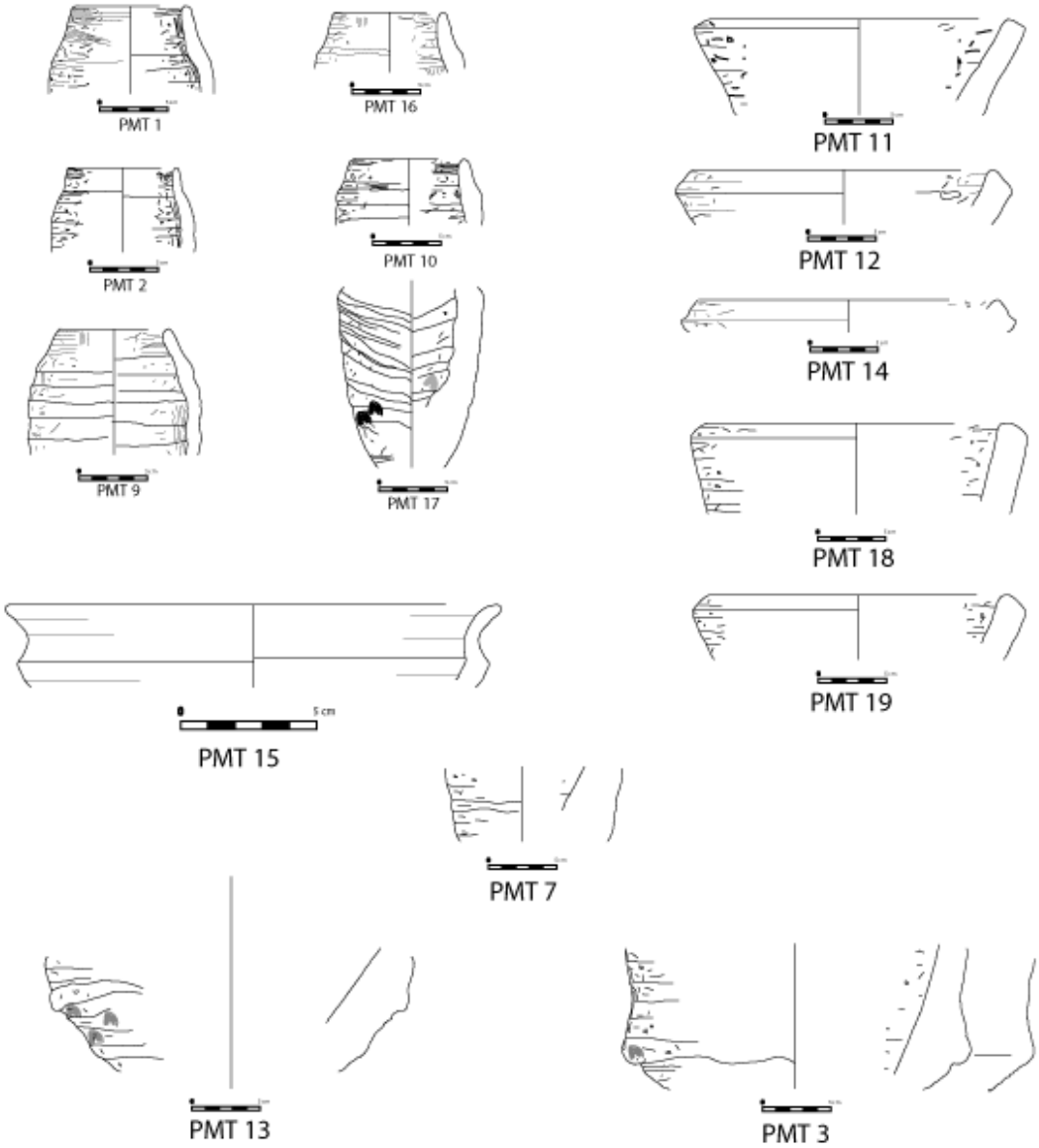
Parallel: Herbert & Berlin, 2003, pp. 87, 89, fig. 66 no. H3.17 (made in marl clay) & Aston, 1999, pp. 334-5, pl. 111:2949
Date: Ptolemaic period (late 3rd - 2nd cent. BC.)

TP 12-167-11 is a rim sherd of a storage jar. The height is 6.8cm, the diameter is 10.0cm and the percentage preserved is 25%. The jar is made of sandy Nile clay fabric and is wheel turned. The exterior surface is washed (scum) and interior surface untreated.

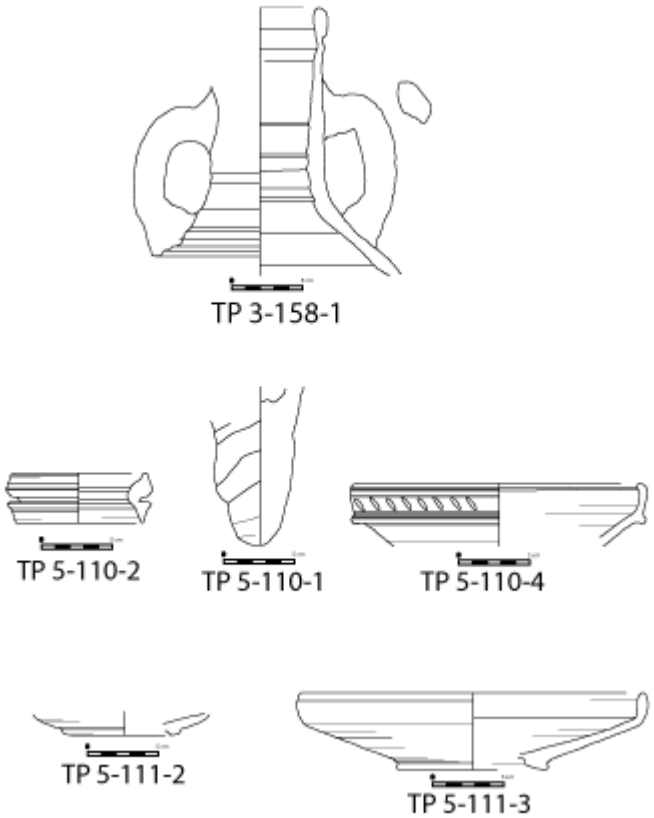


TP 12-167-11

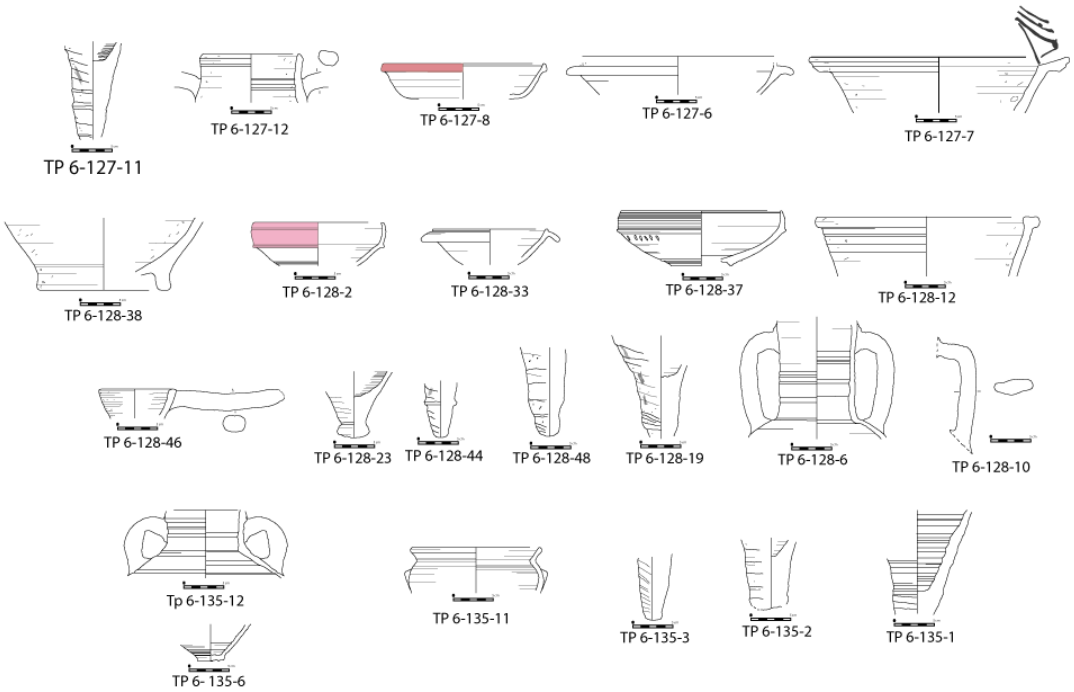
Parallel: Grataloup, 1989, pp. 94-5, pl. 123, no. 128



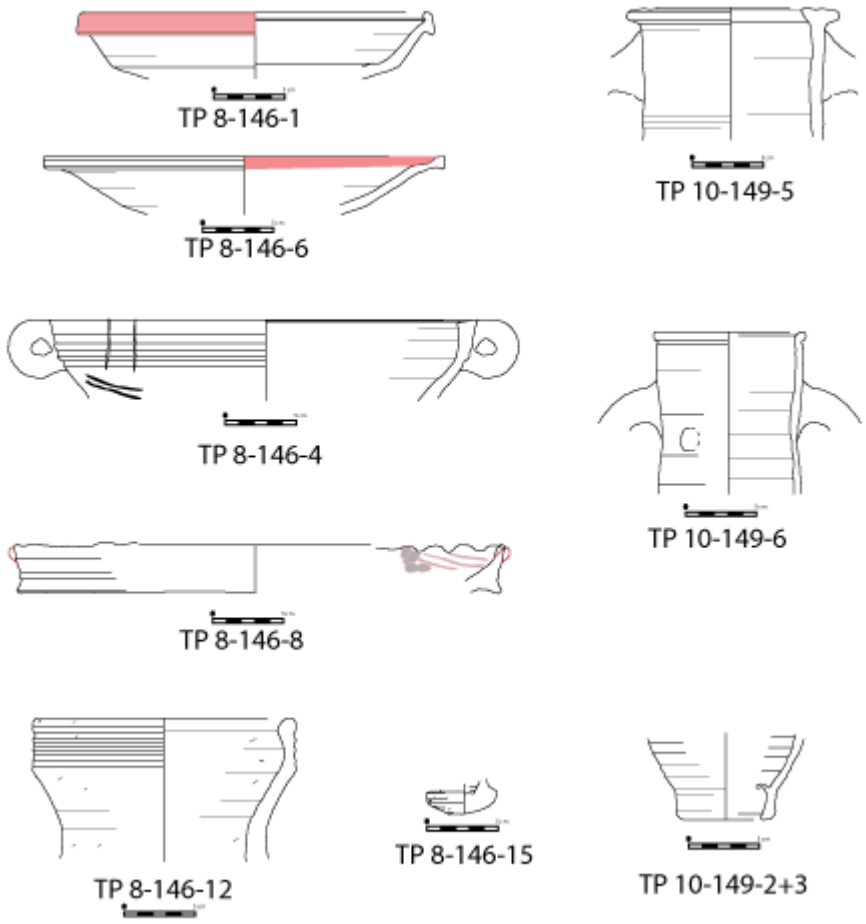
Old Kingdom pottery sample from well 1



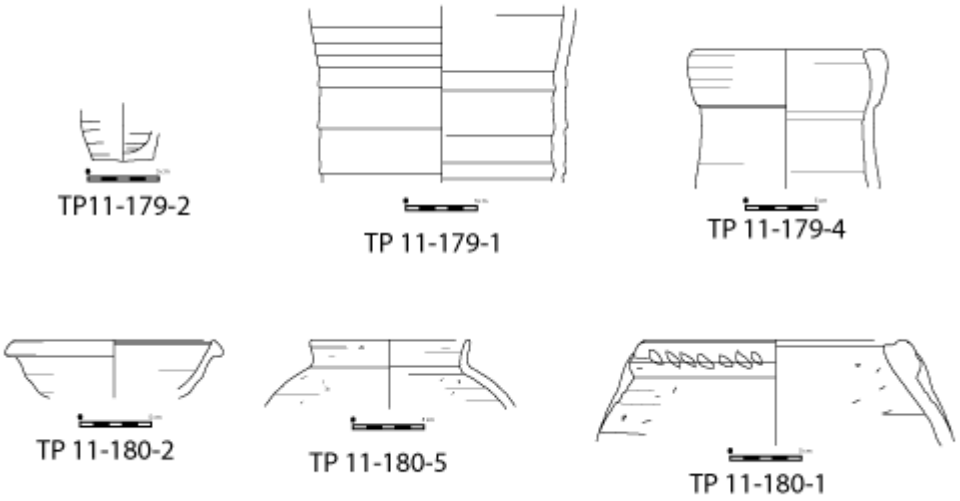
TP 3 and 5 pottery sample



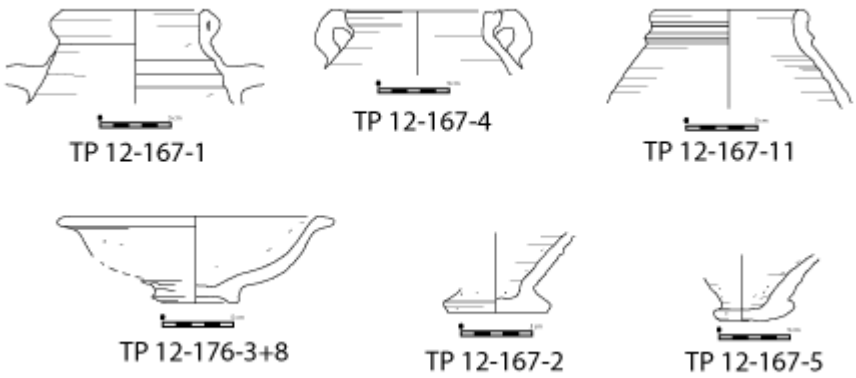
TP 6 pottery sample



TP 8 and 10 pottery sample



TP 11 pottery sample



TP 12 pottery sample

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15 APPENDIX 4. BOREHOLE AND PIEZOMETER REPORT

Introduction

Between 27th March and 15th April 2015 CDM Smith drilled eight boreholes (BHs 3,7,9,10,11,12,14 and15), as part of their geotechnical data collection to inform in their creation of a groundwater lowering design (Figure 1). All of the boreholes were drilled outside the temple, but within the limits of the site, except for BH 15, which was located one kilometer to the east of the temple in agricultural land on the northern edge of a small drain to the north of El-Shatb village (Figure1). The boreholes were drilled to a depth of between 15.45m (BH 10) and 22.5m (BH 9). Boreholes 3,7,11,12,14 and15 were drilled to a depth of approximately 30.5m.

The drilling was done mechanically in the presence of CDM Engineer Dr. Mohamed Kansoh, Engineer Gomaa and the ARCE team (Hussain Rekaby and Mohamed Ahmed Abdel Rahman) with the drilling team of Misr Raymond. The drilling core takes a continuous sequence of sample tubes, usually 1.5m in length with a diameter of 0.06m. Each sample was classified according to its composition and assigned a feature number. For the lose samples, the SPT (Standard Positioning Test) was used to get the sample, also the casing was used for the same purpose. The casing consists of lengths of steel pipe joined together. The number of strings of casing set in the well depends on the depth drilled.

The ARCE team kept their own borehole logs and photographs alongside CDM Smith who also kept their own geotechnical log. The information that we recorded in the borehole logs appear in Section 16.1

Two piezometers were drilled beside every borehole. Since the results were the same as the piezometers they are not discussed here. Additional piezometers were also drilled (PZs 1, 2, 4, 5 and 8; the logs from these are presented here in Section 16.1. All of the piezometers were drilled outside the temple except PZ 1, which was located in the northern court, and PZ 2 and 5, which were located inside the temple (Figure 2). Apart from PZ 15 which was

located one kilometer to the east of the temple, in agricultural land on the northern edge of a small drain to the north of El-Shatb village, the other piezometers were located within the MoA site boundary.

The piezometer drilling core takes a continuous sequence of sample tubes, usually 1.0m in length with a diameter of 0.20m. Each sample was classified according to its composition. The casing consists of lengths of steel pipe being joined to another. A number of strings of casing are set in the well to prevent drilling problems.

Between 29th July and 3rd August 2015, CDM Smith drilled a well (well 1) for use as a pumping test and as part of their geotechnical data collection to provide information for the creation of a groundwater lowering design. The well was drilled outside the temple, between the crocodile museum and the entrance of the temple (Figure 2). The same team members were present as before (with the boreholes and piezometers) and a log was maintained. The drilling core took a continuous sequence of sample tubes, usually 1.0m long with a diameter of 0.30m. Each sample was classified according to its composition.

Boreholes

The sequence of layers in all the boreholes alternated between sand, sandy silt, silty sand and clay (silty clay or sandy clay). Gravel was found in boreholes 3, 9, 10, 11, 14 and 15. Layers containing cultural material, such as pottery sherds and burned mud brick fragments appeared only in boreholes 3 and 14. It is worth mentioning that we did not knowingly hit any archaeological structural remains in the boreholes.

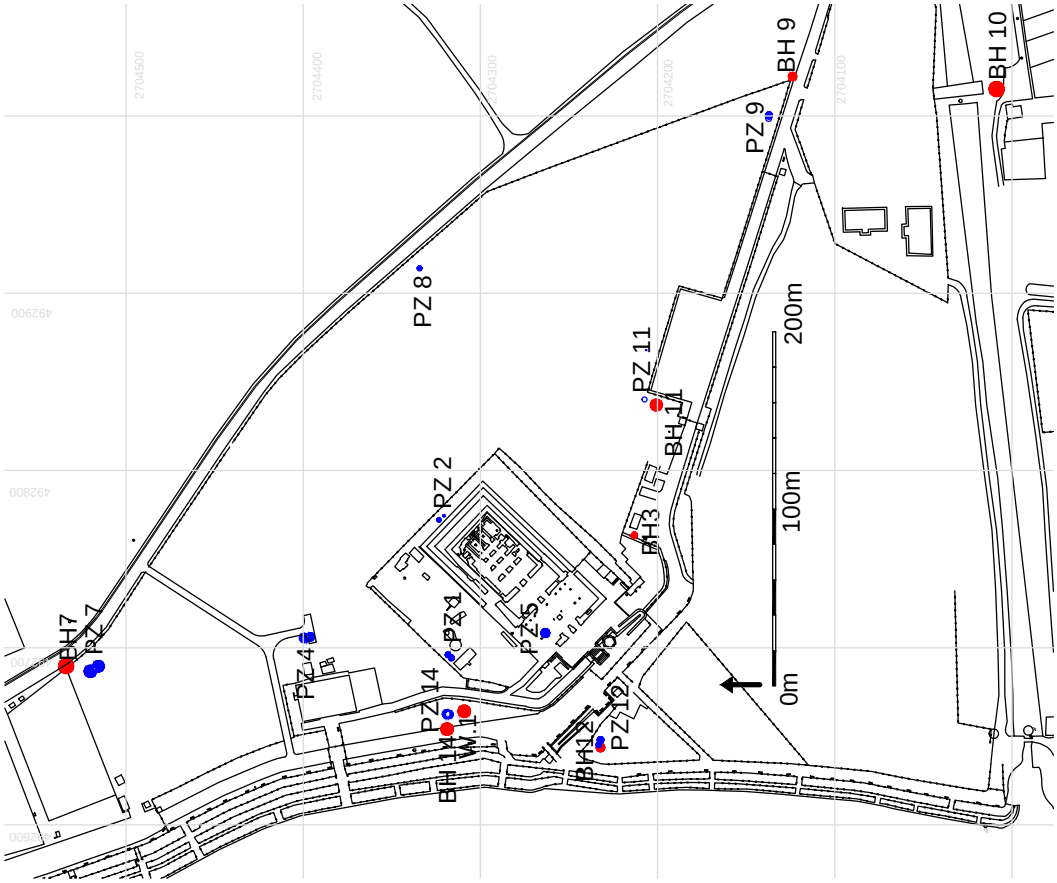

Figure 1. Location of boreholes, piezometers and Well 1

Boreholes 12 and 14 were located to the west of the temple, a little to the east of the Nile riverbank. Borehole 12 contained sand, silty clay and silty sand deposits from 58.34m asl. This sequence included a 10.50m thick deposit of fine sand [226] between 69.84m asl and 80.34m asl (between 8.0m and 18.50m below ground level). This was sealed by a deposit of silty clay at 85.34m asl to 80.34m asl, although no pottery fragments were retrieved from this deposit it may be similar to deposit [232] in Borehole 14 or possibly represent alluvial deposition. The upper three meters of Borehole 12 contained a modern deposit up to 88.34 m asl, presumably laid when this area was developed in 2005 forming its current appearance; made-ground for the tourist area to facilitate docking of cruise ships.

Borehole 14 was located to the northeast, east of the ramp that leads to the Crocodile Museum. Here we encountered fine sand at the base, at 64.01m

asl, sealed by a deposit of silty clay about 5.0m thick which was overlain by a 1.85m thick deposit of sand and gravels [235] (between 68.66m asl and 70.51m asl. This was sealed by a 5.0m thick deposit of fine sand [234] similar to the fine sand [226] in Borehole 12. Sand [234] was encountered between 75.01m asl and 70.51m asl, some 5.0m lower than the sand in Borehole 12, suggesting that the top of the sand slopes downward significantly to the north.

The sand was sealed by a silty sand, upon which was recorded a 3.0m thick deposit of silty clay mixed with occasional pottery sherds [232], between 84.01m asl and 81.01m asl. Crucially therefore, Borehole 14 contained anthropogenic activity between 8.0m and 11.0m below the current ground level. The pottery did not show signs of being abraded and therefore does not appear to have been carried by water. This was sealed with a 4.60 m thick silty clay, up to 88.61m asl, possibly an alluvial deposit? Above this we recorded the recently deposited layers of silty sand mixed with gravel which combined were 3.40m thick.

Boreholes 3, 11 and 9 were located to the south of the temple. Borehole 3 was located just outside the boundary wall beside the western slope of the tell. The borehole contained a sequence of silty sands, silty clay and clay up to 67.70m asl. Upon this, we recorded two layers of gravel, and two layers of fine sand. The upper sand [217] was between 73.20m asl and 71.70m asl, some 7.0m lower than the sands [226] identified in Borehole 12.

This was overlain by silty sand, which in turn was overlain by a 3.50m thick deposit of silty clay containing charcoal [215] indicative of anthropogenic activity. This was recorded between 80.70 m asl and 83.20m asl, which is at a comparable level with the anthropogenic activity found in Test Pit 14 between 84.01m asl and 81.01m asl. Between 83.20m asl and 90.80m asl we recorded two features containing burnt mud brick, a characteristic feature of an early phase abandonment horizon (Kemp:1985) so this could either represent a later leveling of the area (Ptolemaic) or simply accumulated settlement debris related to the tell.

Borehole 11 was to the southeast of Borehole 3 next to the slope of the tell and beside the car park. Here we recorded silty clay at the base overlain by sand with gravel at 74.51m asl. A deposit of silty sand sealed this and was overlain by fine sand [192] between 78.26m asl and 76.01m asl, possibly suggesting a southeasterly upward slope of the sand from Borehole 3 (if this is the same sand layer). Hard clay [191] sealed this from 83.21m asl to 78.26m asl, which may either represent alluvial activity or settlement activity, possibly mudbrick structures given that this horizon is comparable to the charcoal rich material [215] recorded in Test Pit 3. A 6.0m deposit of silty clay sealed this (possibly an alluvial deposit or mudbrick) upon which a 4.30m deep deposit of sand was recorded. This sand probably relates to the restoration of the area in the early twentieth century.

Borehole 9 was located on level ground further to the east, on the corner of the MoA protected land outside the modern enclosure wall. Here we recorded gravel at 71.11m asl, overlain by fine sand between 80.61m asl and 71.11m asl. This was sealed by a sequence of silty sand and silty clay deposits.

Borehole 7 was located to the east of the magazine, on the northern corner of the MoA protected land. Here we recorded sandy clay at the base, overlain by fine sand between 76.92m asl and 64.42m asl, overlain by alluvial deposits up to 83.27m asl. Between 83.27m asl up to 90.92 m asl we recorded what may be three archaeological layers overlain by the modern topsoil.

Piezometers

- **Piezometers 2 and 5**

Piezometers 2 and 5 were originally planned as boreholes, but because of the sensitive nature of the chosen locations it was decided to drill them as piezometers using hand operated equipment.

Piezometer 2 was located to the east of the temple between the outer temple wall and the mud brick enclosure wall (Figure 3). Here we encountered a sandy clay layer from 78.09m asl. This was sealed by a 12.5m thick silty clay

deposit up to 90.59m asl. No sand was recorded. This in turn was sealed by a black deposit containing black burnt brick between 95.59m and 90.59m asl. This was sealed by a 0.65m thick deposit of burnt mudbrick powder between 96.24m and 95.59m asl. This horizon is seen elsewhere on site (see Test Pit Report) and is thought to represent the abandonment of an earlier Old Kingdom/First Intermediate Period settlement (Kemp 1985). This was sealed by a very thin sandy silt layer up to 96.36m asl. Above this we recorded the sandstone floor at 96.59m asl.

Piezometer 5 was located in the west corner of the forecourt of the temple (Figure 4). Here we recorded silty sand at 78.43m asl. Above this, between 90.43m and 78.43m asl, we recorded a 12.0m thick deposit of silty clay with pottery sherds. This material may represent occupation that pre-dates the temple or derive from make-up added to the front of the temple in order to construct the Roman forecourt. This was sealed by a 5.0m deposit of black burnt bricks with an upper elevation of 95.43m asl. (Compare the upper limit of the similar deposit recorded in Pz 2 at 95.59m asl.) In Pz 5 there was no clear reddened powder sealing the burned brick as there was in Pz 2, but there was a reddish sandy silt that may possibly be a related horizon. The paving blocks sealed this at an upper elevation of 96.43m asl.

- **Piezometer 1**

Piezometer 1 was located in the northern court to the northwest of the large well. Here we encountered fine sand at 81.35m asl sealed by a silty sand deposit. Above this, we recorded a 2.0m thick deposit of reddish burnt bricks with an upper level at 91.35 m asl. This was sealed by a 1.50m thick deposit of silty clay and then a 0.50m thick deposit of burnt mudbricks, with an upper elevation of 93.35m asl. Above this we recorded a 2.0m thick deposit of clay above which was 1.0m of gravels and sandy silt that make up the modern floor of the Open Court. The Piezometer location is close to an area of kiln activity (see Section 7.3) which may account for some of the burned bricks, as well as the burning horizon already noted. The results from Piezometer 1 however, show that archaeological remains are present in this location to a depth of at least 7.0m below the current ground level.

Well 1

The well was drilled to a depth of approximately 24m. Well 1 was located to the west of the temple, a little east of the Nile riverbank, west of the ramp that leads to the Crocodile Museum. Here we encountered silty clay at the base, overlain by a 3.50m thick deposit of sand mixed with gravel. A fine sand layer sealed this between 79.78m asl and 72.78m asl. A silty sand deposit sealed this and was overlain by a 4m thick deposit of silty clay mixed with pottery fragments between 84.78m asl and 80.78m asl. A 5 m thick deposit of possibly alluvial silty clay sealed this overlain by a 1.35m thick modern deposit of asphalt and gravel. The pottery from Well 1 is dated to the Old Kingdom and comprises bread molds, beer jars and a fragment of a 'Maidum' bowl. These have been dated to the 4th - 5th Dynasties (see appendix 3).

Summary

The data from the boreholes, piezometers and wells indicate a considerable depth of archaeological features and deposits, below the current ground level, both within and outside the temple. The boreholes and well drilled to the west of the temple (Well 1, Boreholes 12 and 14) indicate that there are archaeological horizons down to 80.78m asl, c. 10m below ground level. The pottery from Well 1 is dated to the 4th - 5th Dynasties (Old Kingdom). To the east of these, within the Open Court, Piezometer 1 also encountered archaeological horizons up to 7m below the current ground level. And to the southeast of the temple we recorded archaeological horizons in Borehole 3 down to 11m below ground level. These horizons probably relate to an earlier, pre-Ptolemaic phase of the settlement and temple. Above these, it seems, is evidence of a burnt horizon (as was suggested by Kemp - 1985), possibly related to a destruction event that pre-dated the construction of the Ptolemaic Temple. This horizon was not identified to the west of the temple (in Well 1, Boreholes 12 and 14), but to the southeast (in Borehole 3), although the burnt brick here may be settlement waste; Piezometer 2, behind the temple; Piezometer 1, in the Open Court; and possibly in Piezometer 5, in the forecourt.

Piezometers 2 and 5 picked up an interesting sequence. These showed that the area to the back of the temple was founded on a 5m thick black, burnt mudbrick deposit that underlay red burnt mudbrick powder. An identical, 5m thick deposit of black burnt bricks was recorded in front of the temple proper – beneath the forecourt. The upper level of this deposit in both piezometers was identical (at 95.43m asl to 95.59m asl).

16 Borehole Log

Borehole 3

Depth	M ASL	Feature No.	Description	Color	Suggested Type	Photograph
0- 1.30 m	92.20	211	clay with roots	Dark grey	modern	
1.30-1.40 m	90.90	212	fine sand	dark brown	Archaeology	
1.40-2.00m	90.80	213	sandy silt with burnt brick fragments	Reddish brown	Archaeology	

2.0- 8.00 m	89.20	214	Fine silty sand mixed burnt brick fragments	reddish brown	Archaeology	
8.00-11.5m	83.20	215	silty clay with charcoal	dark brown	Archaeology	

11.5-19m	80.70	216	Silty sand	light brown	Archaeology?	
19-20.5m	73.20	217	fine sand	brownish yellow	Natural	
20.5-22.00m	71.70	218	gravels	olive brown	Natural	

22.00-23.5m	70.20	219	fine sand	olive	Natural	
23.5-25m	68.70	159	gravel	grey	Natural	
25- 28m	67.20	220	compact clay	dark grey	Natural	

28-30m	64.20	221	silty sand	mid grey	Natural	
30-30.30m	62.20	222	silty clay	dark grey	Natural	
30.30-30.45	61.90	223	silty sand	light grey	Natural	

Borehole 7

Depth	M ASL	Feature No.	Description	Color	Suggested Type	Photograph

0- 0.5 m	91.42	181	sand	light yellow	modern	
0.5- 5.00 m	90.92	182	loose fine silty sand	greyish yellow	Archaeology	
5.00- 7.70 m	86.42	183	compact clay	dark grey	Archaeology?	

7.70-8.15 m	83.72	185	sandy silt	brownish grey	Archaeology?	
8.15-14.5m	83.27	186	fine silty sand	brownish grey in top and dark grey in bottom	Natural	
14.5-27.00m	76.92	187	fine sand	greyish yellow	Natural	

27.00-30.5	64.42	188	Sandy clay	Olive grey	Natural	

Borehole 9

Depth	**ASL**	**Feature No.**	D	**Color**	**Type**	
0- 1.00 m	91.61	173	sand and silt and roots	yellowish grey	modern	
1.00-2.40 m	90.61	174	silty sand	yellowish brown	Archaeology	

2.40-5.25m	89.21	175	silty clay	dark brownish gray	Archaeology?	
5.25-11.00 m	86.36	176	sandy silt	dark brownish grey	Archaeology?	
11.00-20.5m	80.61	177	fine sand	brownish grey	Natural	

20.5-22.50m	71.11	178	gravel	Olive grey	Natural	

Borehole 10

Depth	M ASL	Feature No.	Description	Color	Suggested Type	Photograph
0- 1.00 m	90.79	196	silty sand mixed with gravel and red brick fragments	brown	modern	
1.00-2.10 m	89.79	197	silty clay	dark brown	modern	
2.10-2.20m	88.69	198	sandy silt	dark brown	modern	

2.20-5.00 m	88.59	199	silty clay	dark brown	Archaeology?	
5.00-5.7m	85.79	200	silty clay	dark olive grey	Archaeology?	
5.7-7.50m	85.09	201	loose silt	Dark grey	Archaeology?	

7.5-10.5m	83.29	202	fine silty sand	olive grey	Natural	
10.5-15.45m	80.29	203	silty sand	light brown	Natural	

Borehole 11

Depth	M ASL	Feature No.	Description	Color	Suggested Type	Photograph

0- 4.3 m	93.51	189	Fine sand	Greyish brown	Archaeology	
4.3-10.30 m	89.21	190	silty clay	dark brownish grey	Archaeology	

10.30-15.25m	83.21	191	Hard clay	dark gray	Archaeology?	
15.25-17.5 m	78.26	192	fine sand	dark greyish brown	Natural	
17.5-19m	76.01	193	silty sand	dark brown	Natural	

19-22.80m	74.51	194	fine sand with very occasional gravel	olive grey	Natural	
22.80-30.0m	70.71	195	silty clay	dark grey	Natural	

Borehole 12

Depth	M ASL	Feature No.	Description	Color	Suggested Type	Photograph
0-3.00m	88.34	224	sandy silt	Greyish brown	modern	

3.00-8.00 m	85.34	225	Silty clay	Dark greyish brown	Natural	
8.00-18.5m	80.34	226	Fine sand	Greyish brown	Natural	
18.5-24.70 m	69.84	227	Sandy silt clay	Olive grey	Natural	

24.70-29.5m	63.64	228	Fine silty sand	Olive grey	Natural	
29.5-30m	58.84	229	Silty clay	Dark grey	Natural	

Borehole 14

Depth	M ASL	Feature No.	Description	Color	Suggested Type	Photograph
0- 3.40 m	92.01	230	silty sand mixed with gravel	dark brown	modern	

3.40-8.00 m	88.61	231	Silty clay	Dark brown	Arch.?	
8.00-11.00m	84.01	232	Silty clay mixed with pottery fragments	Reddish Grey	archaeology	
11.00-17.00 m	81.01	233	Silty sand	Grey brown	Archaeology?	

17.00-21.5m	75.01	234	Fine Sand	Greyish brown	Natural	
21.5-23.35m	70.51	235	Sand mixed with gravel	Olive grey	Natural	
23.35-28.00m	68.66	236	Silty clay	Dark grey	Natural	

28.00-30.5m	64.01	237	Fine sand	Olive grey	Natural	

Borehole 15

Depth	M ASL	Feature No.	Description	Color	Suggested Type	Photograph
0- 1.00 m	89.52	204	modern gravel	brown	modern	
1.00- 5m	88.52	205	silty clay	light grey	modern	
5-13.0m	84.52	206	light brown fine sandy silt	light brown	modern	

13.0-22.50 m	76.52	207	fine sand	greyish yellow	Archaeology?	
22.50-28.10	67.02	208	compact silty clay	dark grey	Natural	
28.10-30.35m	61.42	209	fine silty sand	Dark grey	Natural	
30.35-30.45m	59.17	210	clay	dark grey	Natural	