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Tell El-Balamun: Geophysical and Archaeological Survey, 2007-2008

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TELL EL-BALAMUN

GEOPHYSICAL AND ARCHAEOLOGICAL SURVEY, 2007–2008

Tomasz Herbich, A. Jeffrey Spencer

As previously reported (Herbich, Spencer 2006; 2007; 2008), the geophysical survey at Tell el-Balamun, commenced in 2005 as a joint project of the British Museum and the Polish Centre of Mediterranean Archaeology of the University of Warsaw, is aimed at generating a complete magnetic map of the temple precinct (21 ha) in support of the British Museum's site excavation program. The work is now nearing completion. It is directed by Tomasz Herbich, who is assisted in the field by Dawid Święch and Artur Buszek. Archaeological testing of the structures mapped by the survey is carried out by the British Museum team excavating Tell el-Balamun, headed by Jeffrey Spencer with the assistance of Patricia Spencer.¹ The survey ran one week in March 2007, supplemented with a few days in March 2008

1 One of the instruments used for magnetic surveying was provided by the Programa de Estudios de Egiptología (Consejo Nacional de Investigaciones Científicas y Técnicas, Buenos Aires) on the grounds of a cooperation agreement with the Polish Centre of Mediterranean Archaeology of the University of Warsaw.

GEOPHYSICAL INVESTIGATIONS

The magnetic mapping of the temple area at Tell el-Balamun was continued in 2007 with work on the western side of the enclosure, adding to the eastern and southern areas mapped in the two previous years. All of the planned area except for a little over two hectares to the west of the Temple of Amun

was surveyed in 2007. This low-lying area, left muddy after the winter rains, was mapped during a brief visit to the site in drier conditions in the spring of 2008, leaving just 0.75 ha of the precinct to be surveyed in order to complete the map. Altogether nearly 7 ha were mapped in 2007

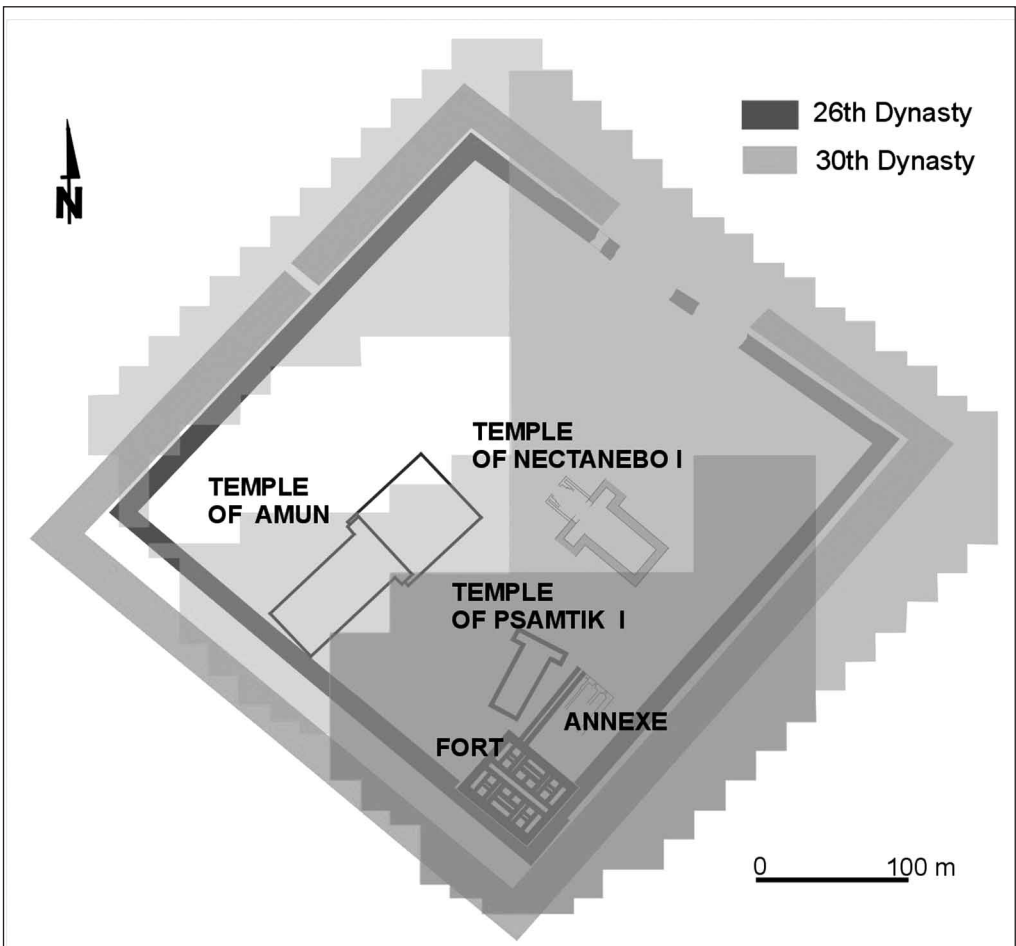


Fig. 1. *Tell el-Balamun, the great temple enclosure. In darker grey, the enclosure wall of the Twenty-sixth Dynasty; in lighter grey, the enclosure wall of the Thirtieth Dynasty. The areas surveyed in particular years (2005–2008) are in grey of different intensity (Prepared by T. Herbich)*

(and 2008), which added to the previously surveyed area (including the strip of land adjacent to the precinct on the outside) gives a total of 20.1 ha [Fig. 1].

The instruments used in 2007 included the Geoscan Research FM36 and FM256. The latter with its bigger memory speeded up the work considerably, as it permitted measurements to be taken in units 20 by 20 m instead of the standard 20 by 10 m used so far. As in previous seasons, the procedure was to take measurements in parallel mode following a measuring grid 0.50 m by 0.25 m, that is, every 0.25 m along lines 0.50 m apart. The sensors of the instrument were adjusted after completing every 20 by 20 m grid unit. The results were presented as greyscale magnetic maps, i.e., maps of changes of intensity in the Earth's magnetic field [Figs 2–5].

The work in 2007 and 2008 covered archaeological features known already from earlier excavations: the main temple on the site (Temple A), dedicated to Amun, and the north corners and northwestern sides of the two enclosure walls.

The northern section of the northwestern side of the exterior wall of the Thirtieth Dynasty shows with great clarity on the map, to the extent that the individual sections of brickwork can be seen (between D5 and B7, Figs 2–4). This effect was noted previously on the scan of the northeastern side of this wall. The length of particular sections is about 30 m; the projecting part is about 18 m long, the recessed part 12 m long. These parameters correspond to those determined for sections on the northeastern side of this wall, the only difference being the wall thickness, which is about 19 m at the widest here, that is, about 2 m more than the wall on the northeastern side. The northwestern gate, excavated in 1994 (Spencer 1996: 57–58), is also quite clear on

the map (in the northeastern part of E4), but the line of the wall to the southwest disappears from view a short distance beyond the gate. The exterior face shows for a slightly longer distance than that on the interior, but the entire western corner of the wall is missing. This is due to ground erosion to a level below that of the wall foundation, the depth of which was not constant but followed the lie of the land at the time of the wall's construction. The section of the wall directly northeast of the gate (between the northeastern part of E4 and the middle part of D5) is just as indistinct — only the inner face is visible. The evident southwestern end of the better preserved northern section of the wall (seen in the central part of D5), is perfectly straight. It could be because of a planned dismantling (or rebuilding) of this fragment of wall adjacent to the north side of the gate.

The inner enclosure wall of the Twenty-sixth Dynasty is also visible around the north corner of the *temenos*, but it becomes difficult to detect in the area southwest of the gate. Due to a high magnetic susceptibility of the fill between the foundations of the walls of the Twenty-sixth and Thirtieth Dynasties, the northwestern face of the Twenty-sixth Dynasty wall is particularly well visible, including the projecting and recessed sections (especially between the northwestern part of D6 and the northwestern part of E5). The inner face of the wall is hardly clear (just two short sections in E5 and in D6 can be discerned on the map).

Inside the north corner of the enclosure measurements recorded a further three concentrations of oval anomalies measuring 1.50 m across with an amplitude range of $-20/+60$ nT (seen in the western part of C7, around the joining of C6 and D6, and in the southeastern corner of D5). The anomalies overlie the remains of the Twenty-

sixth Dynasty wall but do not extend beyond the line of the Thirtieth Dynasty wall. There can be no doubt that they correspond to furnaces. Consequently, the area is to be interpreted as an industrial district established after the Twenty-sixth Dynasty wall lost its function.

Mapping has shown an empty area of irregular shape and indistinct borders

located to the west of the buildings arranged along the northwestern side of the Roman street (fragments of which were excavated in 1991, 1994 and 2003 (Spencer 2005) and which was mapped magnetically in 2006). This area spreads around the joining of squares D6, D7, E6 and E7. It is difficult to say at present whether this space on the map represents

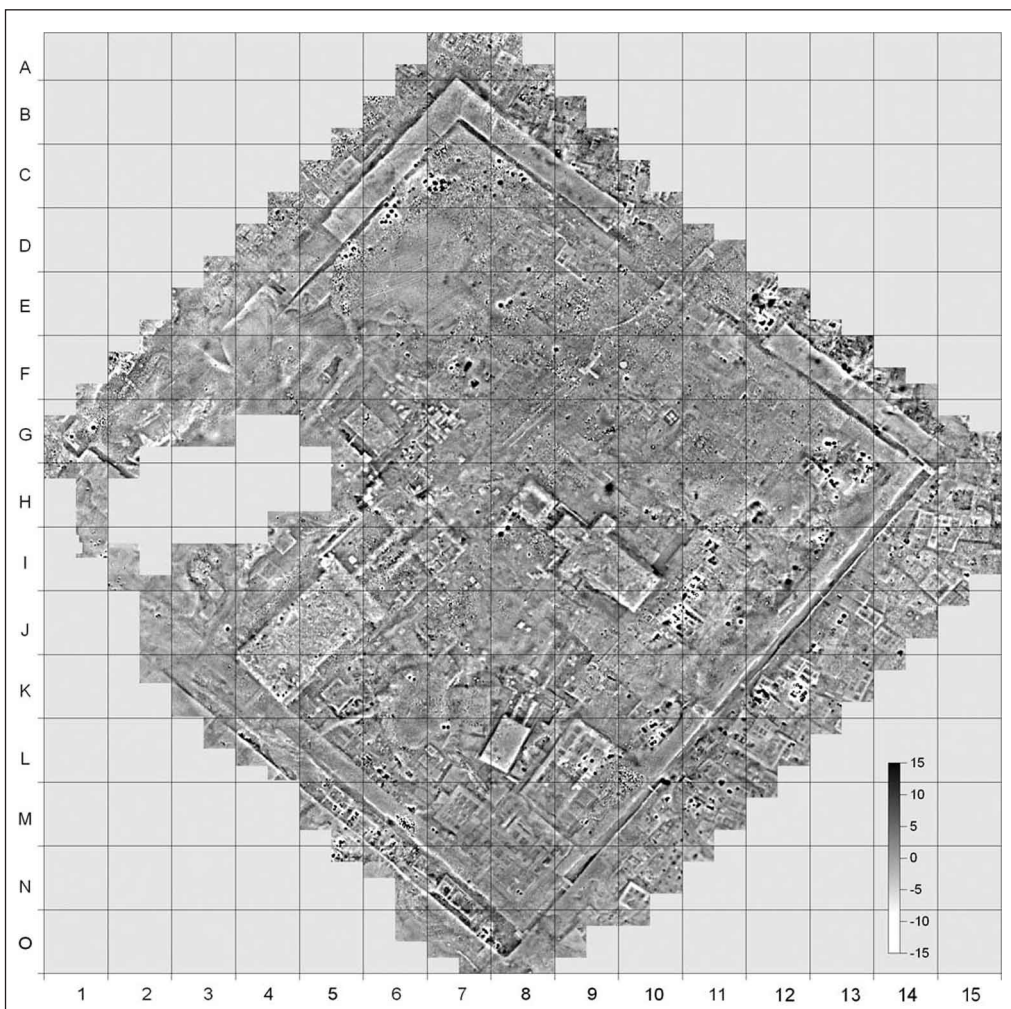


Fig. 2. Magnetic map of Tell el-Balamun. Fluxgate Geoscan Research FM36 and FM256 gradiometers. Sampling grid 0.25 by 0.50 m, interpolated to 0.25 m by 0.25 m. Dynamics -9 nT (white)/ $+16$ nT (black). Grid lines every 40 m (Processing T. Herbich)

an area empty of architecture, the position of a sacred lake or simply intensive digging by the *sebakhin*.

The plan of the temple of Amun shows up well on the magnetic map, with the sand-filled foundations marked by uniformly low values of magnetic field intensity. The plan

agrees with that established through the excavations of 1991 to 1997 (Spencer 1999), but shows, of course, all building phases together. The naos area and second pylon (with corners visible in K4, the southern part of I5 and in the northwestern corner of J6) are the most distinct as it is here that the sand

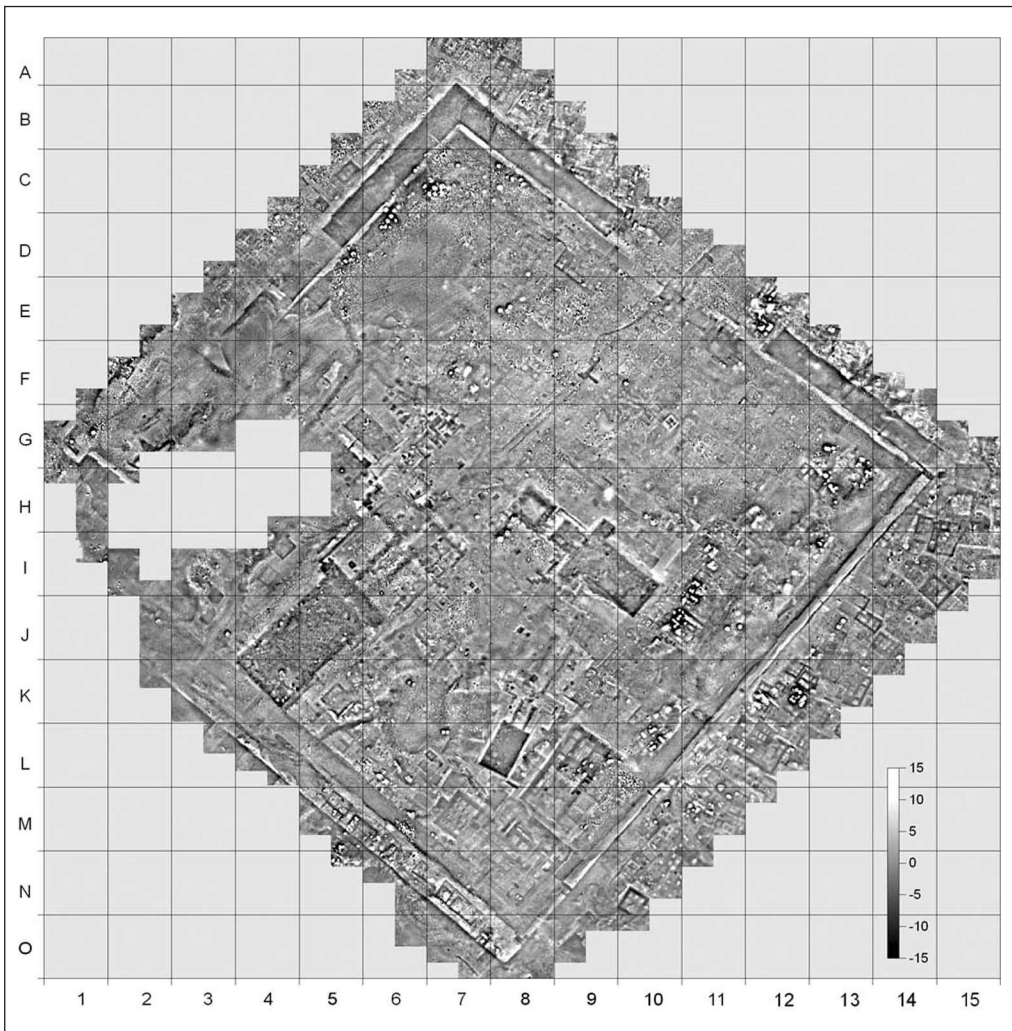


Fig. 3. Magnetic map of Tell el-Balamun. Fluxgate Geoscan Research FM36 and FM256 gradiometers. Sampling grid 0.25 by 0.50 m, interpolated to 0.25 m by 0.25 m. Dynamics -13 nT (black)/+10 nT (white). Grid lines every 40 m (Processing T. Herbich)

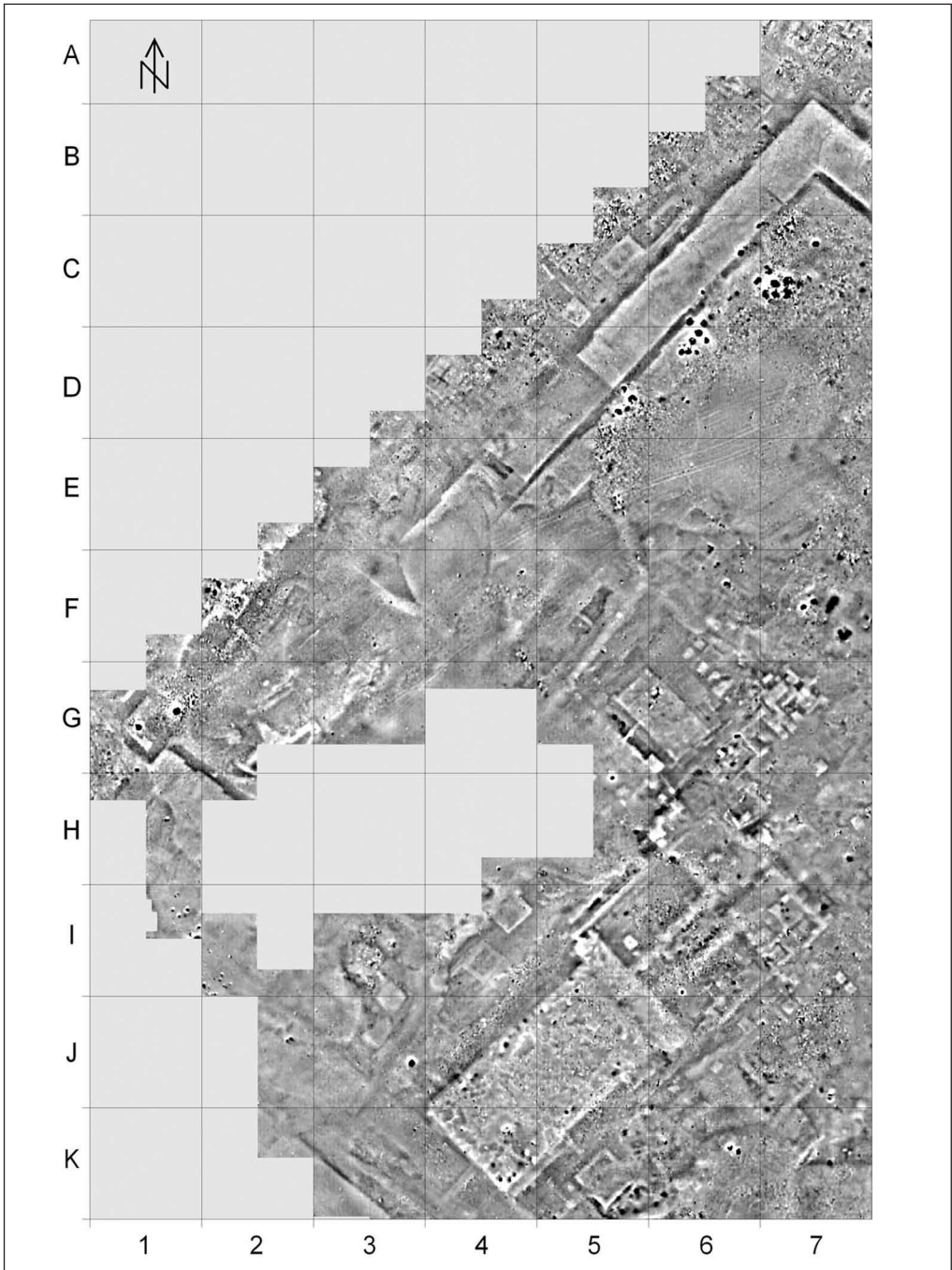


Fig. 4. Magnetic map of the area of the Amun temple and the northwestern part of the great temple enclosure. Dynamics -10 nT (black)/ $+16 \text{ nT}$ (white). Grid lines every 40 m (Processing T. Herbich)

filling the temple foundations is the deepest.² The high-amplitude anomalies of oval shape, 1 m in diameter, visible around the interior of the naos, are perhaps blocks of basalt, like the ones found in 1995 in the rear corner of the foundation, which also show (Spencer 1999: 27, Pl. 29). In front of the second pylon both the narrow colonnade foundation-trenches

of the Twenty-sixth Dynasty (in I6) and the thin courtyard wall of the Thirtieth Dynasty can be seen (with the eastern corner visible in the northern part of I7 and the northern corner in the northern part of H6). The limits of the huge Saite pylon at the front of the colonnade are just about visible, the rear edge being additionally defined by the

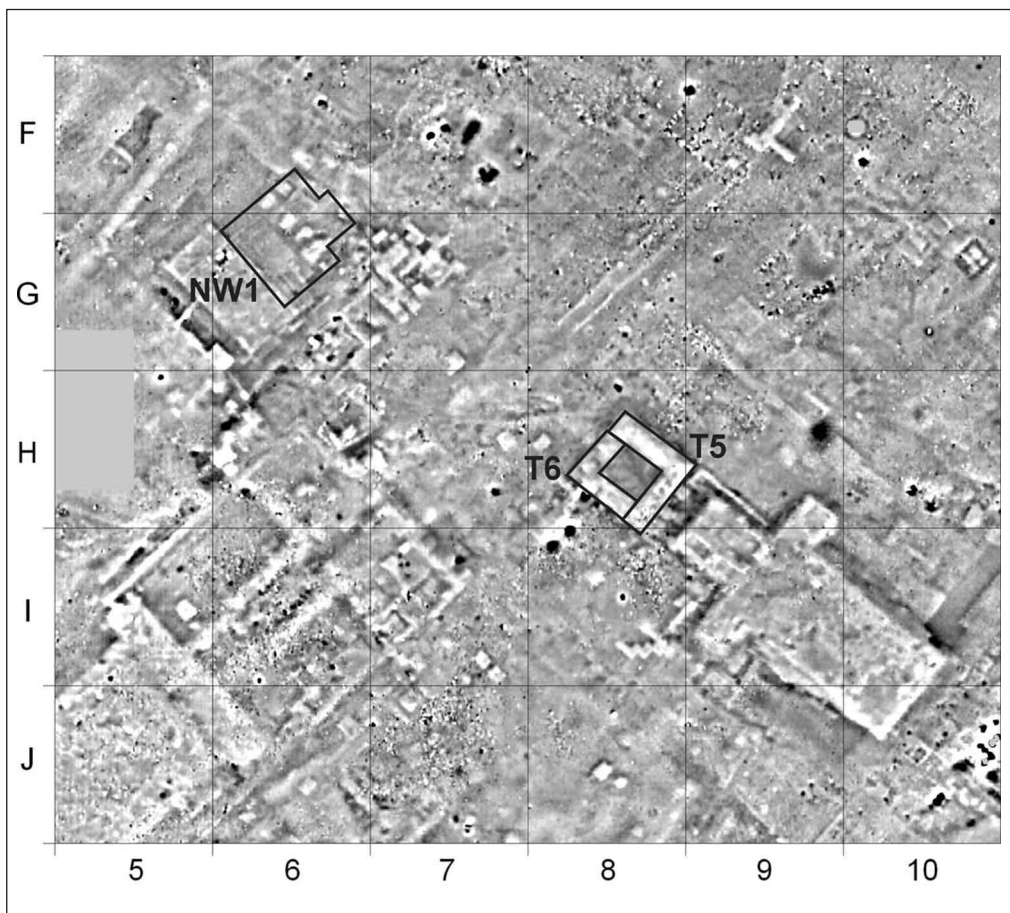


Fig. 5. Magnetic map of the central part of the great temple enclosure and location of the trenches. Dynamics -7 nT (black)/ $+17 \text{ nT}$ (white). Grid lines every 40 m (Prepared by T. Herbich and A. J. Spencer)

2 In the southern corner of the naos the sand layer is 0.85 m deep (counting from the top of the wall foundation); at the short sides of the pylon, this layer increased to 1.20 m in thickness (cf. Spencer 1999: Pl. 8).

negative linear anomaly corresponding both to excavation trenches of the British Museum expedition and the sand-filled foundation.

To the north of the front of the Amun temple lies the elite cemetery, excavated in 1998–1999 (Spencer 1999: 70–72; 2003, 20–30). The many excavation trenches in the area show up as negative anomalies (in the eastern part of G6 and the western part of G7), but their presence actually obscures details of the tombs themselves.

Just outside the front of the temple, to the northwest, the magnetic map reveals a clear rectangular area of slightly lower magnetic values, measuring 16 by 32 m (in the western part of G6, crossing into G5); it corresponds to the sand-filled foundation of the Thirtieth-Dynasty *Mammisi*, studied by excavation in 1998 (Spencer 1999: 56–57). The lesser contrast between the sand fill of the foundation as compared to the environs is due to the lesser depth of this foundation than in the case of the naos of the Temple of Amun (from 0.30 to 0.50 m for the *Mammisi*, see Spencer 1999: Pl. 66). The linear anomaly seen immediately to the southwest of the *Mammisi* (and parallel to it) corresponds to

the edge of a small subsidiary temple, also excavated in 1998, and probably dating from the Third Intermediate Period (Spencer 1999: 73). The thin negative anomaly between these two features (in the southeastern part of G6) marks the position of a cross-section trench dug in 1998.³

The area between the *Mammisi* and the projected wall of the Twenty-sixth Dynasty features fairly stable values of magnetic field intensity. The only anomaly that appears to correspond to the remains of architecture is visible in the center of F5, but this has not been tested by excavation.

In the western corner of the mapped area fragments of a structure perpendicular to the enclosure walls were recorded (between G1 and H2). The structure is most likely a wall, 3 m wide, furnished with evidently projecting sections on the southwestern side. This wall adjoins the southeastern side of a square complex, 21 m to the side, seen in G1. This complex, which still lies concealed in the waterlogged part of the site waiting to be mapped, could not have existed before the destruction of the Thirtieth-Dynasty wall.

ARCHAEOLOGICAL TESTING OF STRUCTURES MAPPED IN THE GEOPHYSICAL SURVEY

In 2007 (and in 2008) the structure discovered in front of the Nectanebo temple continued to be excavated (for earlier work, cf. Herbich, Spencer 2008). Half of the building, comprising the northeast and southeast walls together with the entire southern corner, was excavated in 2007 (Trench T5 in *Fig. 5*) and the remaining walls were cleared in the Spring season of

2008 (Trench T6). The blocks of the lowest course of all the walls were found to be in their original positions, set on a bed of sand, but the masonry of the upper courses had been greatly disturbed during quarrying operations in the Roman period [*Fig. 6*]. At the conclusion of this quarrying, the site was left to fill up gradually with rain-washed mud, so the fill above the masonry

3 The area in which the *Mammisi* and the small subsidiary temple lie was mapped during the short foray in 2008, aimed at reducing the area left unmapped because of waterlogged conditions.



Fig. 6. Northeastern side of the limestone foundation of the kiosk in front of the Nectanebo temple, seen from the southeast (trench T5) (Photo P. Spencer)



Fig. 7. Blocks from a monument of King Sheshonq III, reused in the limestone foundation of the kiosk in front of the Nectanebo temple (Photo P. Spencer)

contained nothing of archaeological consequence. The only informative stratigraphy remained at the edges, where the original foundation trench of the building could be detected, cut into domestic layers of the early Third Intermediate Period. Since the monument was later overbuilt by the approach to the temple of Nectanebo, its stratigraphic context indicates a most likely date of construction in the Twenty-sixth Dynasty. This dating was reinforced by the presence in the foundation of many re-used blocks of Sheshonq III, some with remains of fine reliefs [Fig. 7]. The rectangular shape of the monument suggests that it was a chapel on an elevated platform, probably of the type with columns around the perimeter and

a shrine in the center, approached by a ramp. The building measured 21.20 x 18.40 m.

The feature that was registered to the northeast of the *Mammisi* (situated in the northern part of G6) was tested in trench NW1 [cf. Fig. 5]. The feature proved to consist of a mud-brick foundation platform [Fig. 8] for a structure built adjacent to, and probably contemporary with, the foundation of the *Mammisi*. The row of pale anomalies on the northeast side of this platform proved not to be individual features, but the effect of a single large area of loose pit-fill overbuilt at intervals by mud brick. Apart from the monuments mentioned above, neither the area inside the northern corner of the enclosure nor that in the western corner has so far been investigated by excavation.



Fig. 8. View of the brick foundation platform located by the magnetic survey to the north of the temple of Amun (trench NW1) (Photo P. Spencer)

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