Defining a City in Napatan Kush: Geophysical Prospection at Sanam[1]

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Introduction

Cities have played a significant role in how archaeologists understand the development of ancient states and empires. They remain focal points of archaeological fieldwork, as sites of monumentality, loci for the aggregation of people, the performance of political authority, the accumulation and display of wealth, and as centres of regional economic systems. For most ancient cultures, it is difficult to conceive of complexity without reference to cities. Evaluating the ways that urbanisation has affected societies requires a comparative perspective, yet to date our models of ancient urbanism remain fundamentally based on the agrarian cities of the ancient Middle East.

There are some exemplary studies of urban settlements in Nubia,[2] with Kerma and Hamadab being the most fully investigated (e.g. Bonnet 2014; 2019; Wolf 2015; and more generally Welsby 2019; we exclude here the walled settlements of the Egyptian New Kingdom occupation – see Spencer 2019), but these are exceptions in a long and presumably varied history of urbanism in the region. Thus, we have a corresponding lack of knowledge about the role played by settlements in the political, economic, and social life of ancient societies in the Middle Nile.

Figure 1. Location of Sanam at the centre of ancient Kush (sources: Esri, DigitalGlobe, Earthstar Geographics, CNES/Airbus, DS, GeoEye, USDA FSA, USGS, Aerogrid, IGN, IGP, and the GIS User Community).

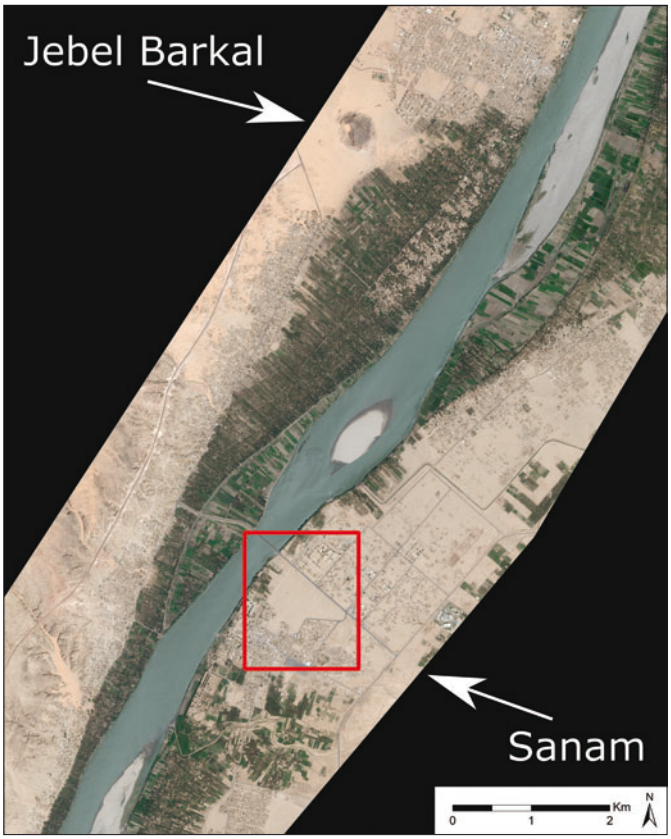

Figure 2. Location of Sanam at the centre of ancient Kush. Jebel Barkal is visible in the top centre of the image (basemap is Worldview-2 satellite imagery).

As a contribution to understanding urbanism in Kush, we report here on an investigation of urban form at the site of Sanam (Figures 1 and 2), part of the heartland of the empire of Kush during the Napatan period (*c.* 800-300 BC).[3] In particular, we present the results and interpretations of a comprehensive magnetic survey of Sanam conducted in

[2] In this paper, we use the term 'Nubia' to designate the broad geographic area extending from modern Aswan in southern Egypt to Khartoum in northern Sudan, encompassing desert regions on either side of the Nile. 'Kush' is the indigenous name of the specific empire we discuss in this paper, but there were other contemporary groups in Nubia, particularly people in the Eastern Desert and also likely to the south. 'Napata' is the name of the capital city of Kush during the mid-1st millennium BC – it is centred on the site of Jebel Barkal, but the term in ancient texts also sometimes refers to the broader region around Barkal, including the site of Sanam that is the focus of this paper.

[3] Thanks to Kitty Picken for her generous support of this work.

2016-2018,[4] together with a test excavation of part of one architectural unit at the site to correlate magnetic signals with archaeological features.

Sanam

The site of Sanam (Figure 3) is well known from its excavation by Griffith in the 1920s (Griffith 1922; 1923) and from renewed excavations in the settlement by Irene Vincentelli (2011; 2018a; 2018b). On current evidence, the site appears to have been founded in the late New Kingdom. Excavations have focused on several discrete structures. The largest is a building known as the 'Treasury', which is 267m long, with a wide colonnade flanked on either side by large rooms along its entire length. The Treasury was largely empty in the original excavation, apart from some burned elephant tusks found in one room, and is thought to have been a storehouse, probably royal due to its size. A building on the east side of the site, SA.K. 300, was a royal workshop for production of valuable trade goods, its connection to the Napatan palace indicated by seal impressions of kings from Piankhy to Anlamani (*c.* 725-600 BC; Vincentelli 2006-2007). A modest sized temple was built to the west of the settlement area during the reign of Taharqo (Griffith 1922; Pope 2014) and is now the focus of a new excavation project (Howley 2018). Griffith's excavations (Griffith 1923) recovered approximately 1500 non-royal burials of the Napatan period (recently re-analysed by Lohwasser 2010; 2012), and more recent excavations at the nearby site of Eltameer (Murtada Bushara Mohamed 2018) have recovered remains of a nearby higher status cemetery that may also have been associated with the settlement.

Geophysical Prospection Methods

In order to investigate the settlement around the previously known features at Sanam, our project undertook a preliminary season of geophysical prospection in 2016 to test methods (Tucker and Emberling 2016), followed by two seasons of more complete survey coverage at Sanam in 2017 and 2018. With the potential demonstrated by the clarity of the features in the 2016 preliminary season, we continued with magnetic gradiometry, sometimes referred to as 'magnetometry', in the subsequent seasons. Magnetic gradiometry is a method in which the gradient of the magnetic field is measured across the surface of a site, or survey area, and then plotted, giving

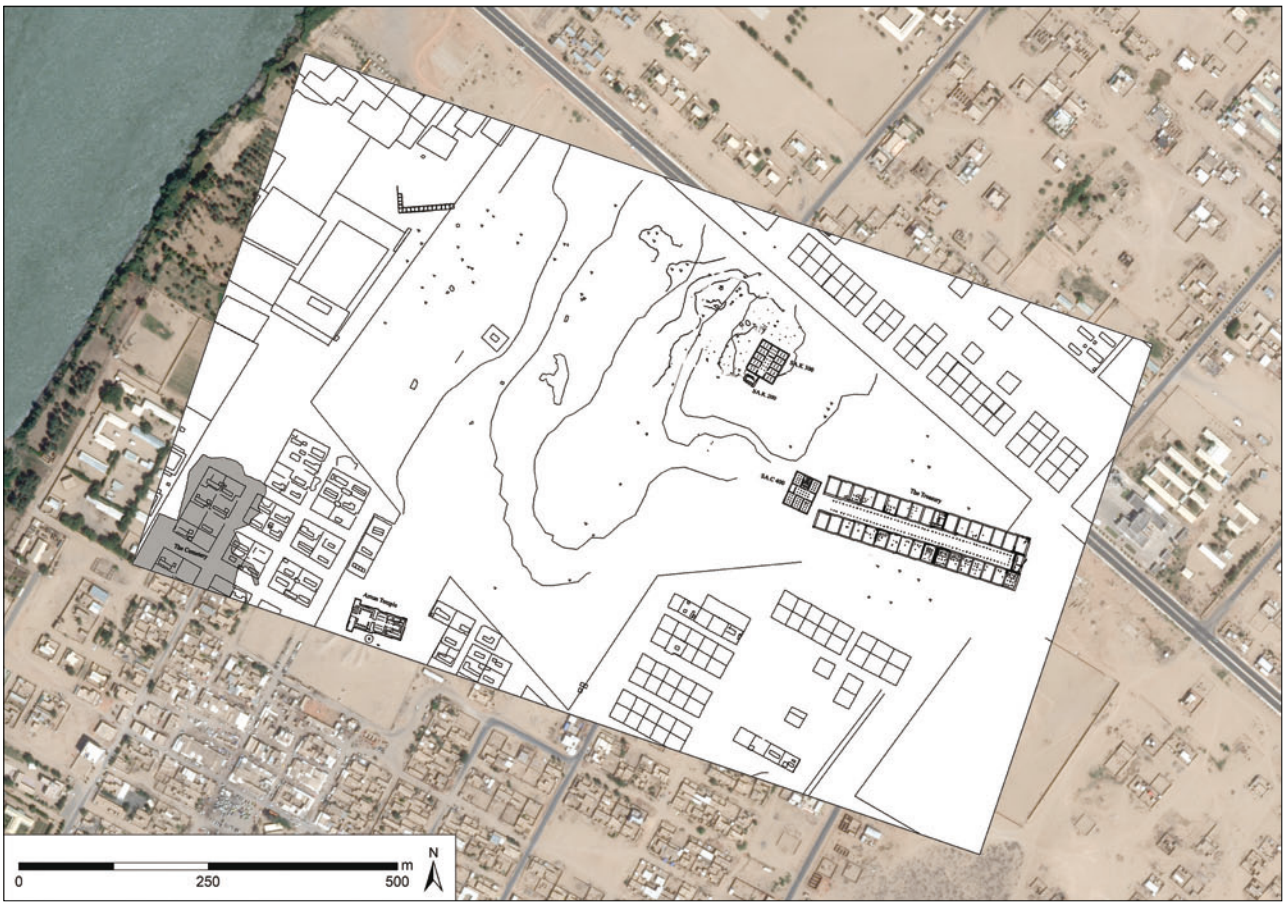

Figure 3. Plan of Sanam with previously excavated structures (basemap is Worldview-2 satellite imagery).

[4] The site is currently encircled by two fences, one delimiting a large settlement area, and one protecting the Temple of Taharqo. Magnetic survey covered the entire area within the larger fenced area as well as the area between that fence and the Temple of Taharqo. It is clear however, that the fence does not encompass the entire area of the ancient settlement.

a two-dimensional map of the measured values. These values do not indicate depth but do indicate where anomalies or features, often associated with human activity, lie in the near subsurface. Although the exact depth detected varies based on the strength of the signal, in general features are more readily detected in the uppermost 1-2m of deposits.

We conducted our survey at Sanam using a Bartington Grad 601-2 fluxgate gradiometer and data was collected in a zig-zag pattern of traverses spaced 0.50m apart in 30 x 30m grids across the entire site, including overlapping some of the previously excavated features to confirm the effectiveness of the technique.[5] The results confirmed the conclusions from the preliminary season, and the outlines and occasionally interior features of a number of distinct structures emerged from the landscape. In the case of architectural traditions in Nubia we would expect baked brick to return the greatest positive contrast with the surrounding sandy site matrix, since the process of firing induces a higher magnetic charge, while mudbrick or sandstone may appear less distinct, although still producing a negative signal (Fassbinder 2017).

Geophysical Prospection Results

At Sanam, our survey was conducted within the context of the active archaeological excavations at the site, which have recently focused on a number of structures at the eastern edge of the protected area, including the Treasury. In the end, we covered 29.5ha of the site, stretching from the Temple of Taharqo on the west to the area past the Treasury to the east (Figures 4 and 5).

The results at Sanam are interesting because of the large scale of the buildings (cf. Sievertsen 2015), the apparent absence of areas of domestic housing or a city wall, and the concentration of architectural features in the central portion of the site between the Temple and building SA.K. 300.

The northern quadrant of the site is a large area gently sloping down to the Nile dotted with small mounds that do not necessarily align with our magnetic results on a one-to-one basis (Figure 6). The scale and density of results in this area is in stark contrast to areas near to the Treasury, which were notably 'blank'. The survey also revealed multiple parallel rows of point anomalies, which are at times evenly spaced, other times unevenly. These features have been interpreted as features lining roads such as tree pits in previous magnetic surveys of Kush (Török 1997, 193; Welsby 2009, 76; Welsby 2014, 6), but when excavated by Welsby (2018, 91-92), they were not tree pits, but deposits of enigmatic function. They appear too large to be column bases in our survey, and their interpretation remains inconclusive (Figure 7). Two other magnetically 'quiet' areas are also notable: one along the paved road to the north and northeast could be an underlying geological feature such as an infilled wadi; and a second in front of the Taharqo temple could be an open area surrounding the temple (Figure 4).

The city plan suggests two axes lined with buildings ranging in size from quite large to massive, many with a similar rectangular form. We now present the results building-by-building, with observations on the size, internal structure, and other features of each.

Building 1 is a mudbrick building built of grey bricks that are clearly visible on the surface of the site toward the southern edge (Figures 8 and 9). The building measures approximately 45 x 25m, with its largest room being 15 x 13m. A possible platform or earlier construction is visible to the SW and SE. The grid of walls may be primarily foundations. Unlike many of the buildings on the site, this structure contained no visible column bases, although there is a row of parallel columns to the northeast that may be part of a barely visible building.

Building 2 in the centre of the site appears to be the largest building discovered by our magnetic survey, with dimensions of roughly 90 x 120m, although the outer walls are not rectangular (Figures 10 and 11). In comparison, the platform of the Meroitic palace of Natakamani at Jebel Barkal is roughly 63m on each side (Maillot 2016). It is also possible that this represents an enclosure wall with structures inside it. There is an entrance midway along the southeast wall that appears to be over 10m wide with 2-3 columns across the entrance. Two of the apparent interior rooms contain four columns each; one of these rooms is apparently 17m along one side.

Building 3 is about 60 x 35m in size with a large entrance (about 9m in width), slightly off-centre, on the southeast wall (Figures 10 and 11). The entrance leads to a courtyard roughly 22m wide that contains 4 columns. One corner of this building was excavated by Vincentelli; see below.

Building 4 seems to have had its four corners damaged by later pits (Figures 12 and 13). It measures roughly 80-65m and has a series of rooms along its SW edge measuring 8-11 x 6m in size. A room to the northwest is 7.5 x 11.5m in size and contains no visible columns.

Buildings 5 and 6 are located to the west, forming a separate row of structures. It is possible that the area between these buildings and Buildings 2 and 3 may also have contained large enclosures, but these are only very partially visible on the magnetic plan.

Building 5 is about 60 x 37m in size with a probable entrance portico on the southeast side that is 6m wide and 6m deep (Figures 14 and 15). The two anomalies on either side of the entrance, marked by arrows on the plan, are in the locations where we might expect guardian lion statues or at least plinths, as proposed for the Napatan palace at Jebel Barkal (Kendall 1997, 323). This interpretation is of course speculative, based on the spatial relationship with these features and the entrance. There is little internal construction visible on the magnetic plan.

A building to the south of Building 5 is cut by pitting and possibly wadi erosion and is too fragmentary for further interpretation (Figures 14 and 15).

Building 6 to the north is about 50 x 30m in area with a

[5] Thanks to Bakri Abdelmoneim, Abdelbaqi Salah, and Ibrahim Sidahmed from the El-Kurru village for their assistance with the survey in the field.

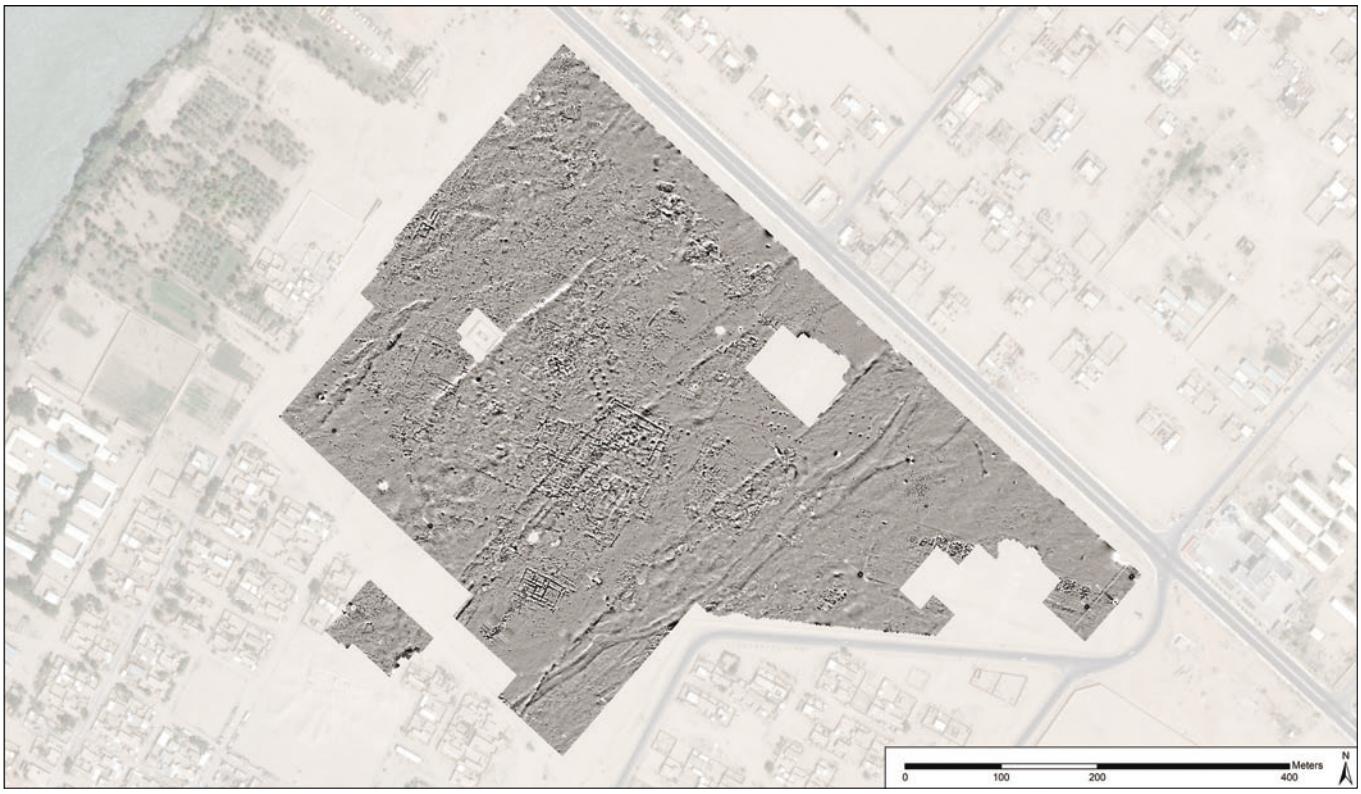

Figure 4. Overall geophysics results plot (basemap is Worldview-2, satellite imagery).

Figure 5. Overall geophysics results plot with interpretation highlights in red (basemap is Worldview-2 satellite imagery).

Figure 6. The surface of Sanam, looking west, showing the slope down towards the Nile and some reddish mounds. The northern edge of the fenced area is bounded by the road at the upper right (photograph: Tim Boaz Bruun Skuldbøl).

narrow portico 3m wide and 5m deep that may have been a staircase entrance (Figures 14 and 15). It is connected to Building 5 by one or more small walls.

Building 7, located against the site fence on the Nile side of the side, appears very fragmentary on the magnetic plan, which could perhaps indicate that bricks have been robbed from the walls (Figures 16 and 17). Exterior walls or foundations enclose an area about 43m wide, and there appears to be a central rectangular room 16 x 12m in size.

Building 8 is also located on the Nile side of the fenced area (Figures 18 and 19). Its exterior walls are not clearly visible on the magnetic survey but the structure extends at least 40 x 18m.

Finally, Building 9, discovered in our 2018 season, is located on the east side of the site closer to the Treasury (Figures 20 and 21). It is a small square building, 15 x 15m in size, with a regular internal grid structure of walls. It has two possible additional extensions on 2 or 3 sides.

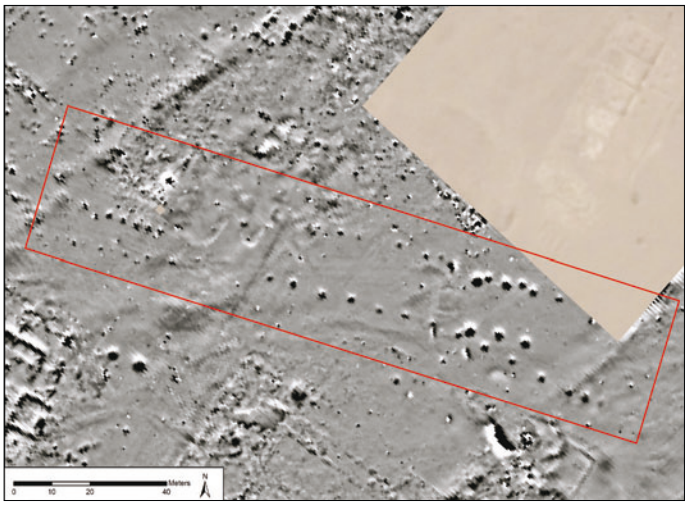

Figure 7. Example of somewhat regular, but large, point features.

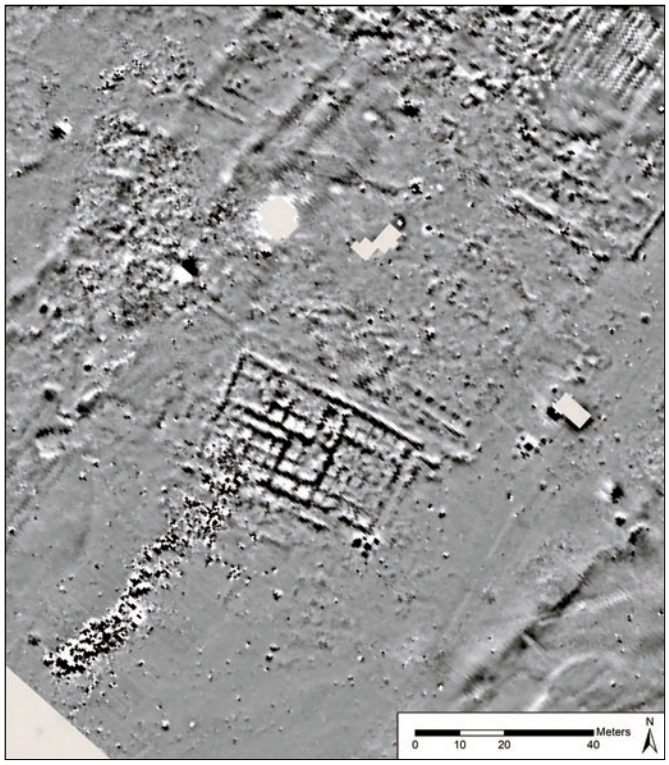

Figure 8. Building 1 - Results.

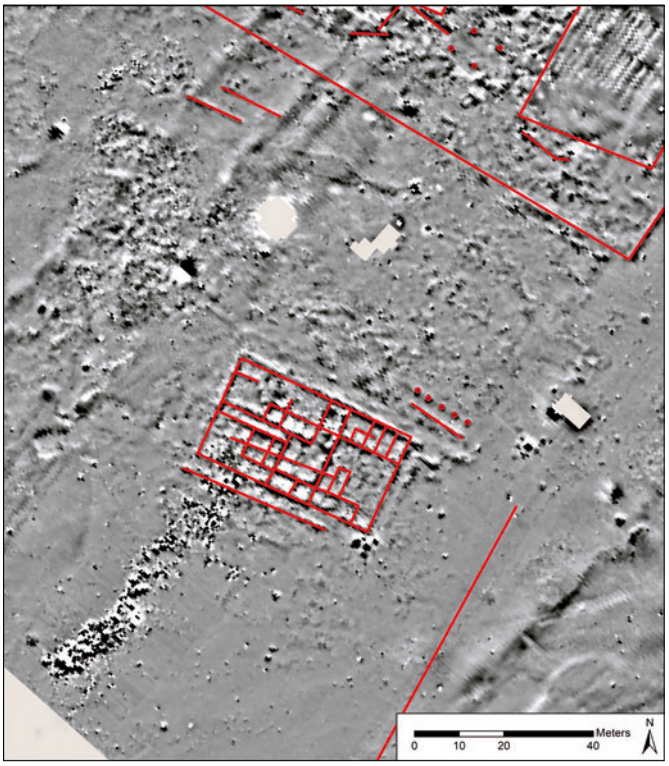

Figure 9. Building 1 - Interpretation.

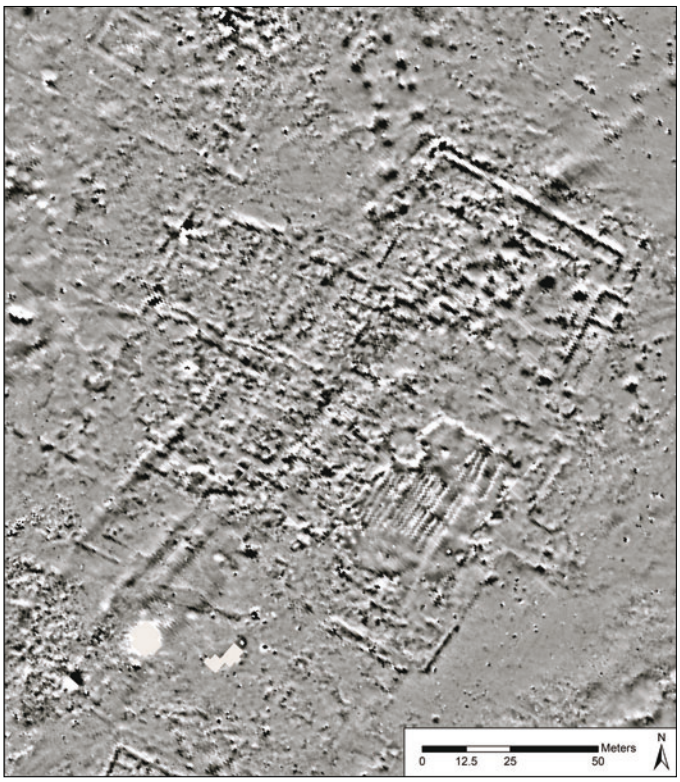

Figure 10. Building 2 (larger, southern) and 3 (smaller, northern) - Results.

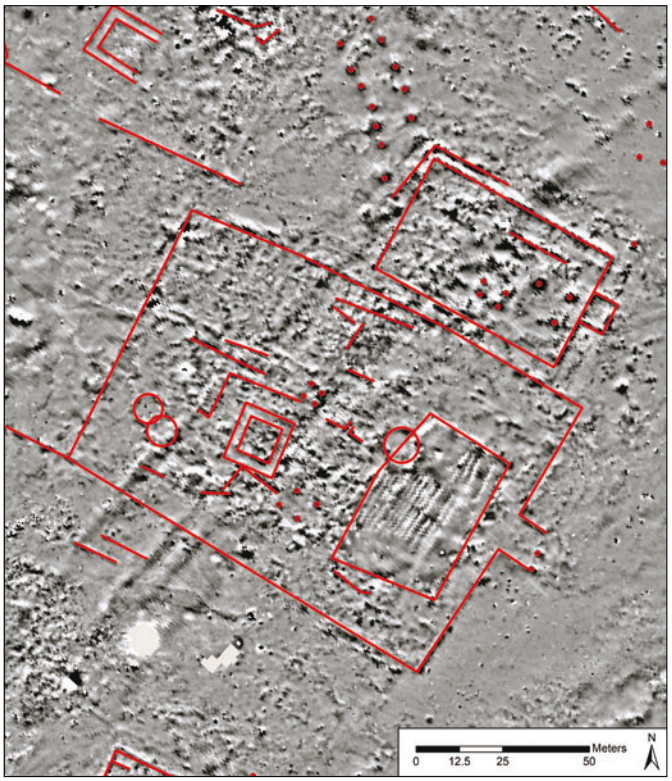

Figure 11. Building 2 (larger, southern) and 3 (smaller, northern) - Interpretation.

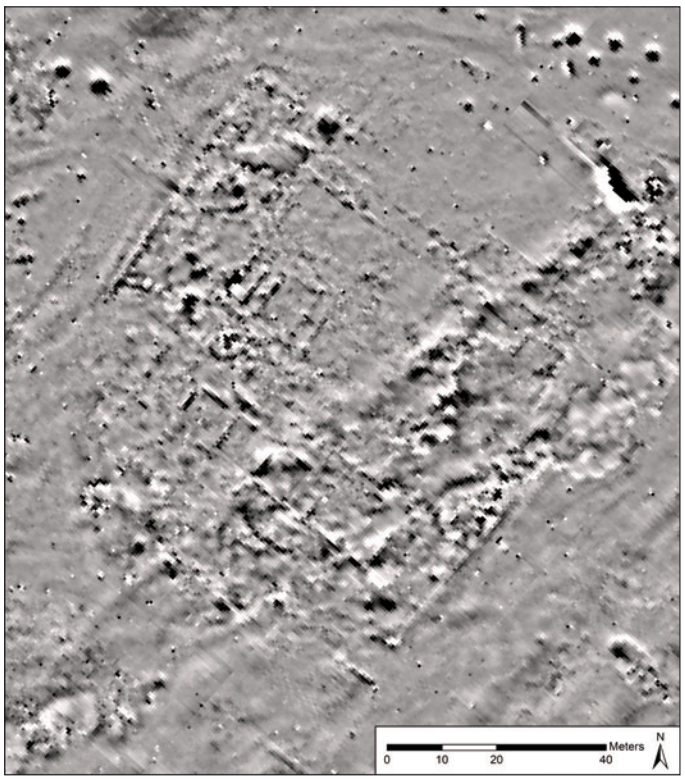

Figure 12. Building 4 - Results.

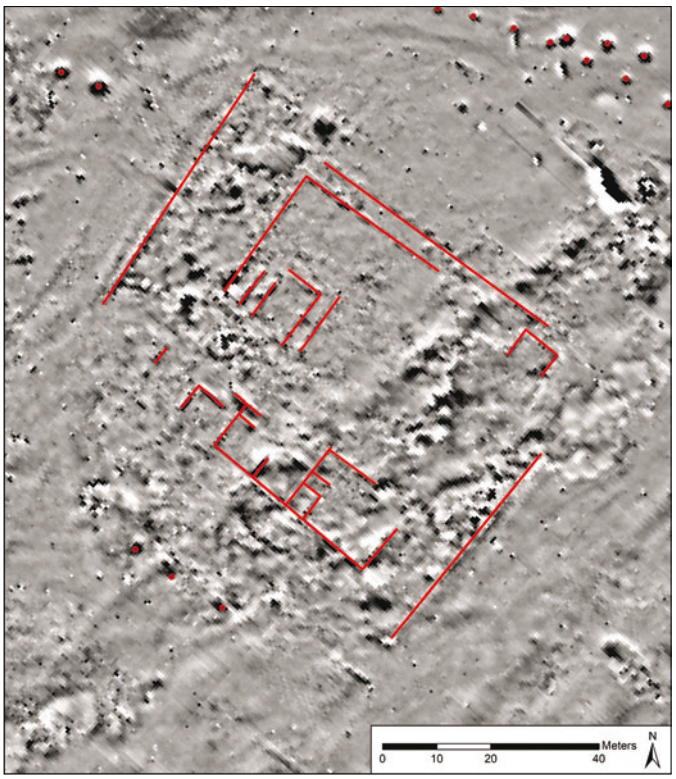

Figure 13. Building 4 - Interpretation.

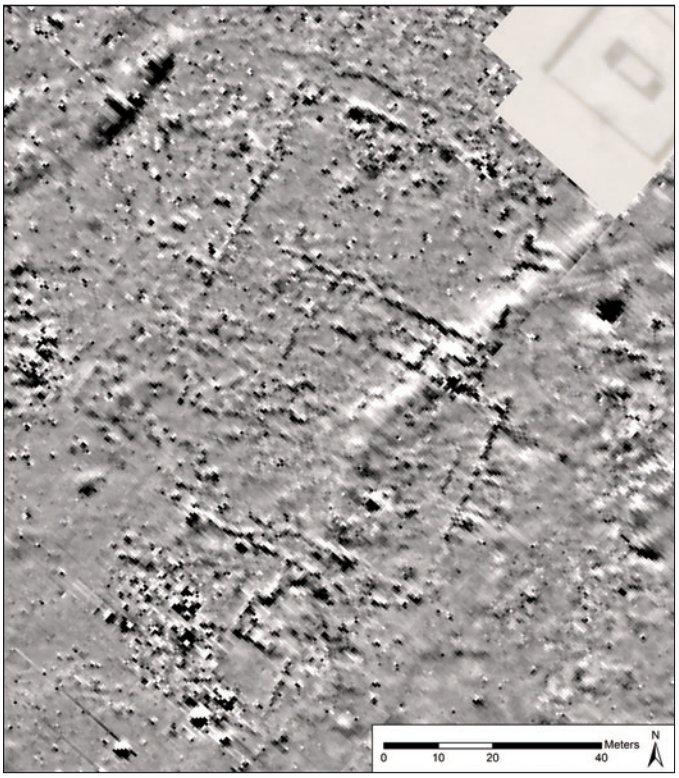

Figure 14. Building 5 (larger, southern) and 6 (smaller, northern) - Results.

Figure 15. Building 5 (larger, southern) and 6 (smaller, northern) - Interpretation.

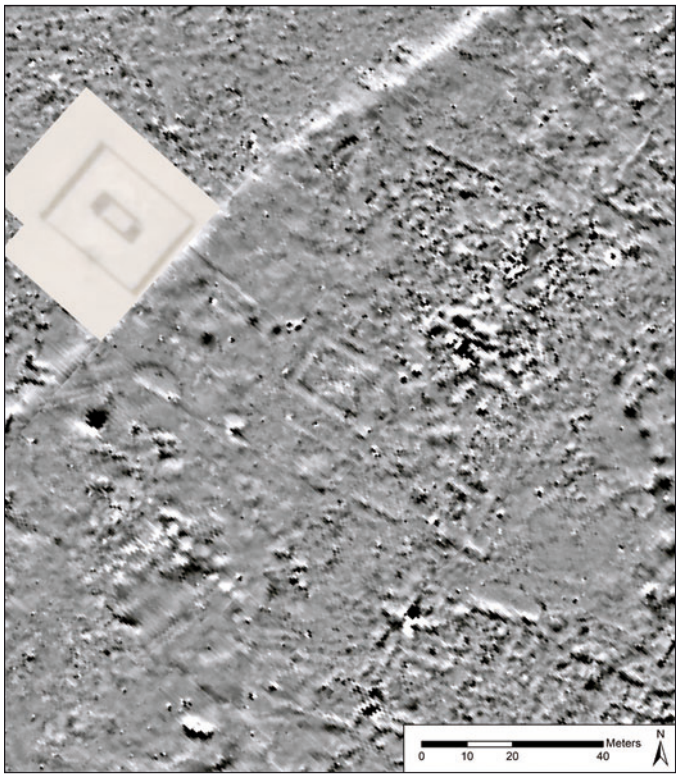

Figure 16. Building 7 - Results.

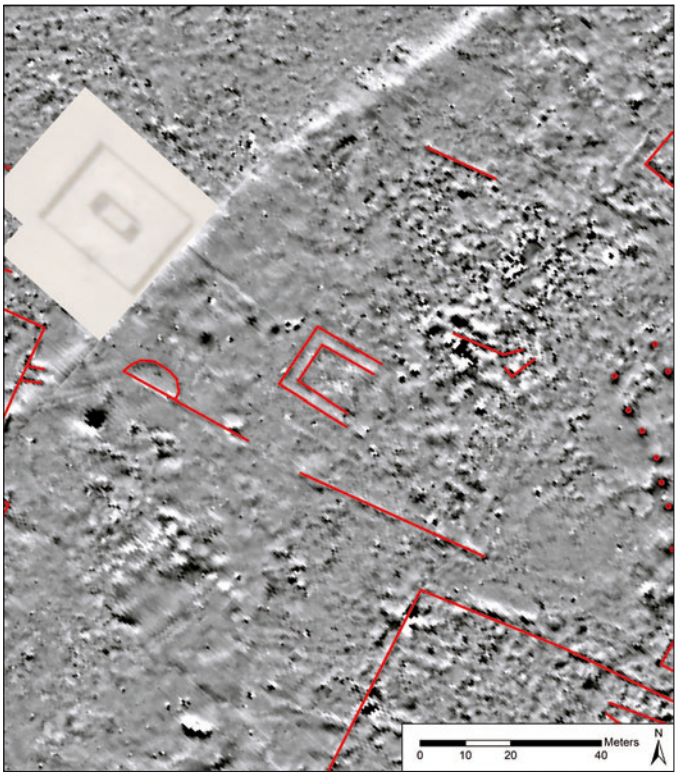

Figure 17. Building 7 - Interpretation.

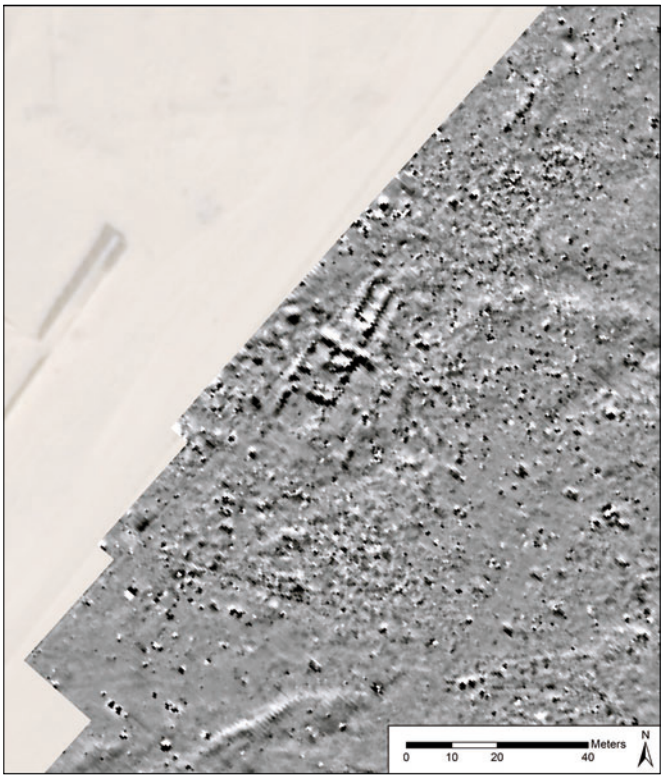

Figure 18. Building 8 - Results.

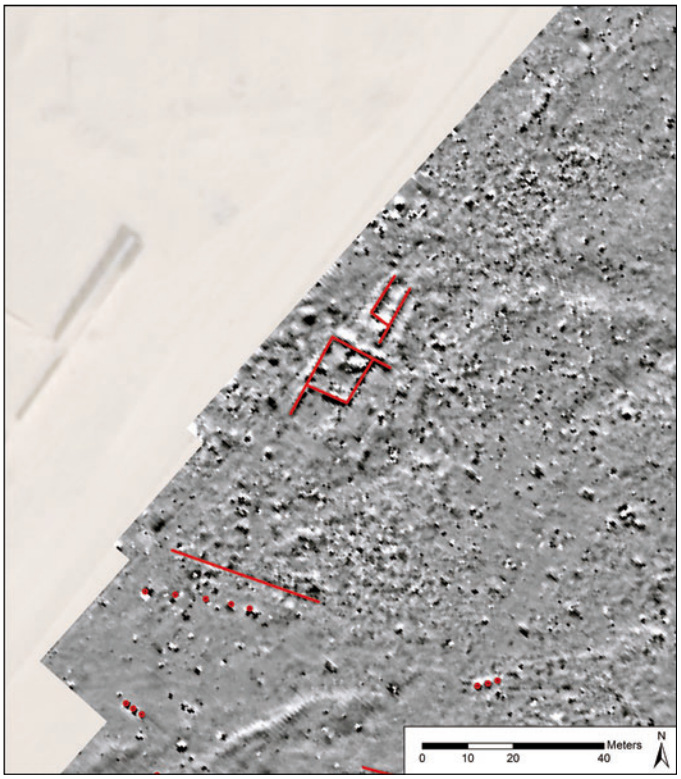

Figure 19. Building 8 - Interpretation.

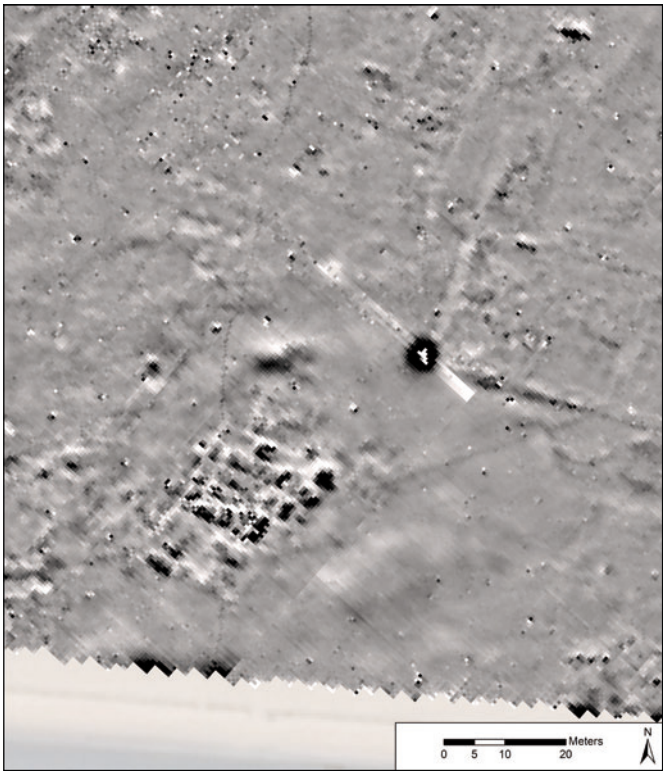

Figure 20. Building 9 - Results.

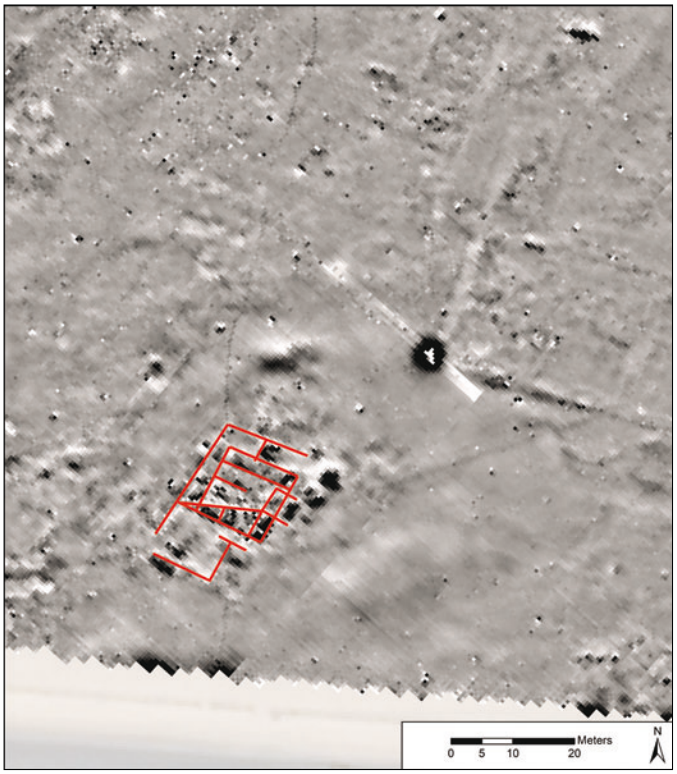

Figure 21. Building 9 - Interpretation.

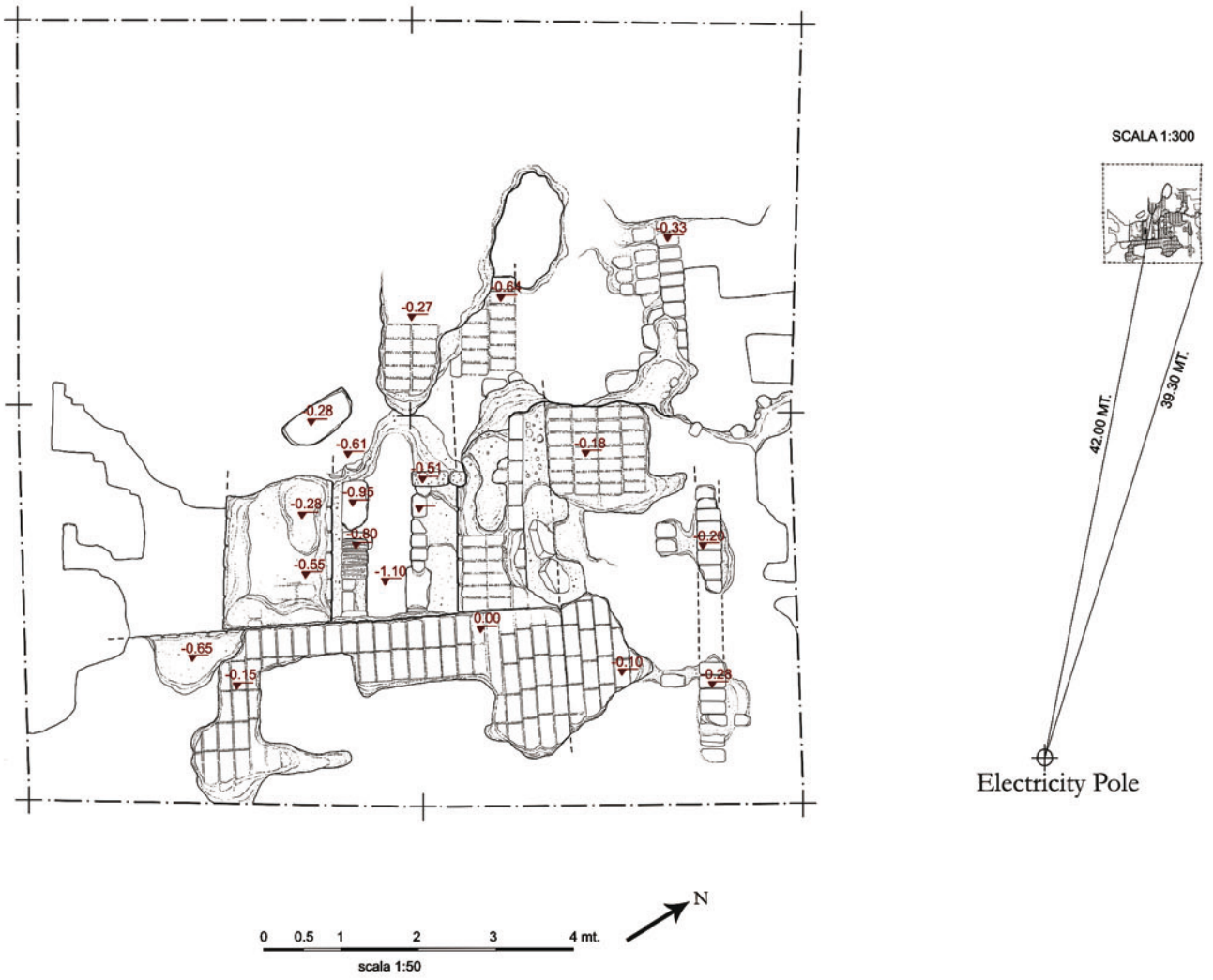

Figure 22. Plan of sondage at the eastern corner of Building 3, Test 1.

Test Excavation of 'Building 3' (Irene Vincentelli)

The test excavation was complicated but interesting. The building appeared to be subdivided in a number of sections of varying dimensions, and it had been cut by a number of later pits of probably modern date (Figures 22 and 23).

We excavated a total of 20m² and, with some difficulty, were finally able to expose two large walls, 2m thick, joining at a right angle, forming a corner. Other smaller walls (about 1.2m thick) abutting the larger north-south wall, were preserved to a height of 800mm, creating such small spaces that they cannot be called rooms. At the bottom of the better preserved of those spaces we found large slabs of white sandstone that must have formed the original floor of the building. Layers of red bricks had been added in order to raise the floor level. More red bricks had been used to repair small areas where the internal face of the walls had collapsed.

The pottery found was not abundant – mainly fragments of Egyptian marl clay storage jars, dating from the 8th-6th centuries BC, and some traditional handmade Nubian pottery. However the presence of red bricks, which were not used during the Napatan period, points to the Meroitic period. The resulting chronology would probably indicate a building erected during the Napatan period, restored and modified during the Meroitic period.

At this point it is too early to be able to state how the building was used, but there is evidence of a long period of occupation that is reminiscent of what occurred in the nearby Temple of Taharqo.

Conclusions

It is obvious that these results provide a tantalising hint of the nature of settlement at Sanam, and that a fuller programme of surface collection and excavation will be required to understand the construction, use, and chronological placement of the site. At the same time, they are useful on their own – we have shown that the area within the modern fence at Sanam was a special purpose site constructed on a mostly massive scale. Analysis of the excavation results at least one of these buildings indicates that it was constructed

Figure 23. Photo of sounding at the eastern corner of Building 3, looking west.

during our period of interest and continued in use, with modification, in later periods. We may hypothesise that the other structures with similar alignments and of similar scale and form also have a similar lifespan, at least covering the Napatan through the Meroitic periods. Although these structures may help us understand some kind of expenditure and control of resources, we are still left with some questions about the city, namely those related to the local population. The residential settlement at Sanam – the dwellings of all the people buried in the cemetery there – remains to be located.

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