

QSAP: Dangeil 2018-19. Conservation challenges and an ever-expanding sacred landscape

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Recent excavations and conservation conducted in the late Kushite temple complex at Dangeil over the course of the Qatar-Sudan Archaeological Project (2013-2019) have revealed many surprises and provided much information about this ancient edifice.¹ Of note, work in the Amun

on either side of the kiosk on top of these pedestals. Pigments remaining on these fragments have provided clues as to the court's original decorative appearance (Figure 1, Plates 1 and 2) (see further Anderson and Salah Mohamed Ahmed 2013; 2015, 91-94; Anderson *et al.* 2017, 159, 161, 167; Anderson *et al.* 2018a, 410-411; Anderson *et al.* 2018b, 111-112).

Wall painting conservation

In 2015, further information concerning the decorative programme of the temple's peristyle court was found during excavation of the south-east corner of the north pylon of the monumental gate when part of a wall painting was uncovered. It was not fully exposed in 2015 and was placed within a temporary protective structure while plans were made to conserve the painting in future seasons (Anderson *et al.* 2017, 165-166, pl. 18). It was fully exposed and conservation initiated in 2018 (Plate 3). The scene, from the lower register on the wall, depicted a repeating frieze of lotus flowers which

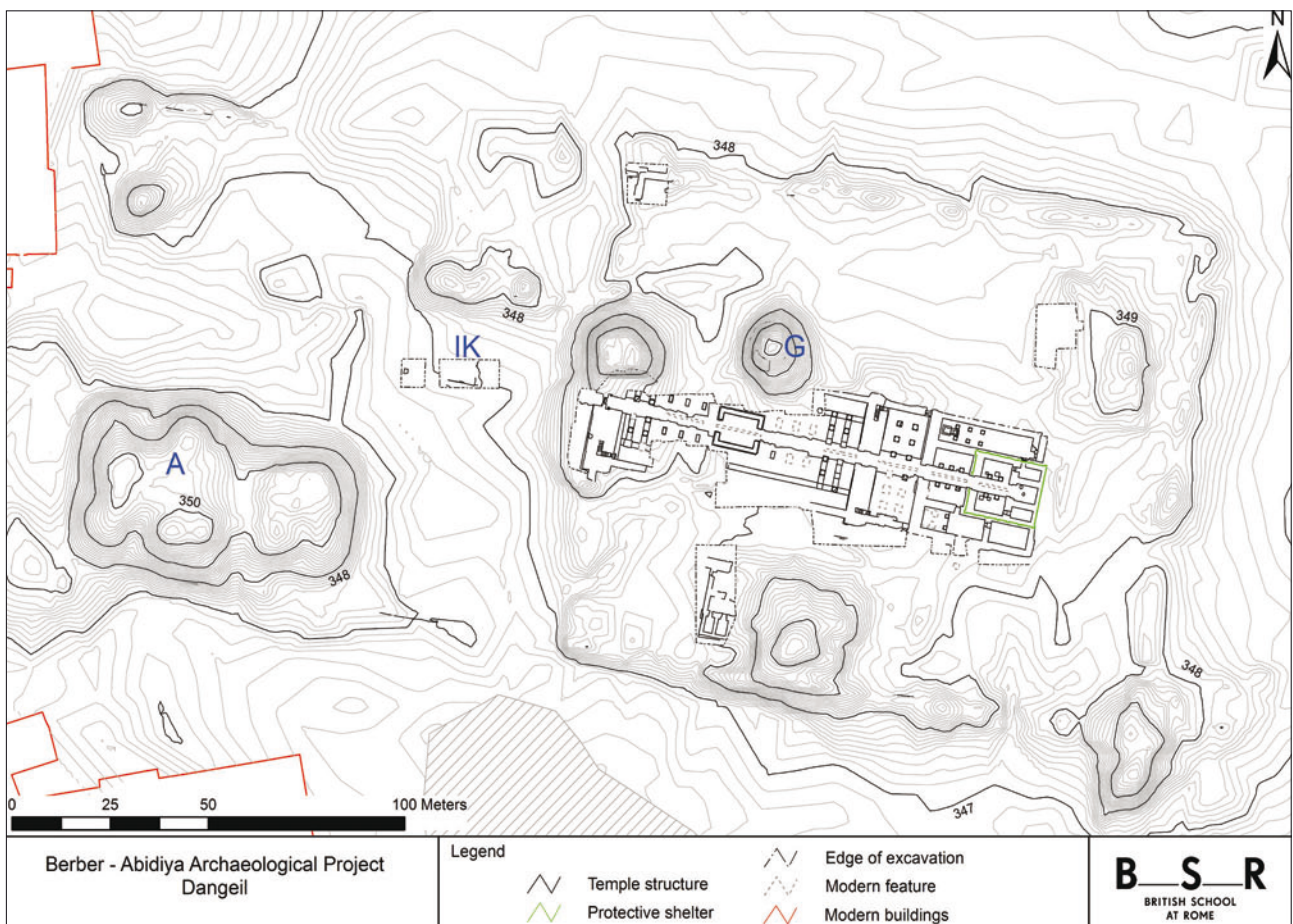


Figure 1. Dangeil site plan.

temple's peristyle court exposed the processional way through the building and part of the colonnade around a central kiosk. Within the court, the processional route was flanked by a total of twelve statue plinths. Numerous fragments of architectural elements and sandstone ram statues were discovered, the latter indicating that three ram statue pairs had been situated

include open blossoms, flowers in the process of blooming and emerging buds. The flowers had been painted in yellow, red and blue pigments on white lime plaster. Red and yellow pigments, likely derived from naturally occurring hematite and goethite ochres, were the colours best preserved. Blue was the most fugitive of the pigments and probably was a man-made



Plate 1. Main entrance to the Amun temple, facing east along the processional way towards the sanctuary (drone photo: Mohamed Tohami).



Plate 2. Peristyle court facing west towards the temple entrance.



Plate 3. Wall painting in situ.

copper silica compound (Egyptian blue ($\text{CaCu}[\text{S14O10}]$)). These pigments were also used elsewhere in the temple, notably on the kiosk in the peristyle court and columns and walls of the first hall.² The image formed part of the lowest

²These pigments were identified using Raman spectroscopy. See further

register on the wall. Horizontal red painted lines underlay the picture and had been used to guide the artist. Part of the right side of the painting was burnt, though it is uncertain at what point in time this occurred. Measuring 0.9m high x 1.2m long, this is one of the largest late Kushite wall painting fragments found thus far *in situ* in a non-funerary context.

The painting's survival *in situ* was threatened by the detachment of plaster layers in several areas and by the volatility of the pigments, but more crucial was the state of the wall face. It was structurally unstable and actively collapsing as the outer brick courses were crumbling and separating from those laid within the wall core. Initially, the painting was documented both graphically and

photographically.

Cleaning and pre-consolidation of the paint layer, followed by the placement of a protective facing of cotton gauze on the image, were done on site, and then it was detached from the wall. The reverse side of the painting was consolidated and covered in a layer of hydraulic lime mortar which was left to carbonate for 20 days. Three layers of carbon fibre textile of different weights were then applied with bi-component epoxy resin, and bars of Aerolam (aluminium honeycomb panel) were inserted for further support as well as to prevent flexion (Plate 4). Following a month of conservation work, the painting was successfully un-faced and its lacunae filled with lime mortar in November 2018 (Plates 5 and 6).

Kiosk IK

Work was conducted on the southern half of the temple's main gate and surrounding area in 2017 and 2018 with the notable discovery of a flag pole niche and carved footing situated midway along the exterior face of the south pylon (Anderson *et al.* 2018b, 108-111). To see if the processional way extended beyond the front of the temple, excavations were conducted to the west of the main entrance. Excavations uncovered a rectangular kiosk aligned with the temple's axis (Figure 1, Plate 7). The foundations were of fired brick, and the floor comprised of regular sandstone flagstones and of randomly laid fired bricks of various shapes and sizes, which included column drum quarters and irregular fired tiles.

The kiosk measured approximately 9.7m north-south x 12.3m east-west, and the bricks used in the foundations were the same size as those found in the Amun temple (360-280 x 180 x 80-100mm). Kiosk IK is the same size as the kiosk enclosed within the peristyle court, and both follow regularised architectural planning principles, were symmetrical, and proportionally constructed at a ratio of 8:5. The unit of measurement used was the cubit (52.3cm)

Anderson and Salah Mohammed Ahmed 2008, 42.



Plate 4. Wall painting conservation. Creation of the painting support and application of the carbon fibre textile.



Plate 6. The conservation team discussing the wall painting after detachment and mounting.



Plate 5. Wall painting conservation. Removal of the protective cotton facing.

and this was also used in the temple.³ Although the walls of Kiosk IK were not preserved to any great height, it may be suggested that the upper part of the superstructure was topped with a carved stone cavetto cornice and had rounded corners with engaged columns as based on the associated architectural fragments found. These remains included a candy-striped cornice and red painted column capital that formed part of the rubble overlying the structure (Plates 8 and 9). It appears that this kiosk was brightly coloured red, yellow, blue and black, pigments also used throughout the temple complex and in the wall painting discussed above.

The processional route that linked the temple with the outer kiosk (IK) was flanked by an avenue of rams. Remains of two rectangular statue plinths were discovered, one on the east side between the temple and the kiosk, and one on the west side of the kiosk suggesting the avenue continued westward, though where it led, and its length remains unknown.⁴ The plinths were made



Plate 7. Kiosk IK (orthophoto: R. Hajduga).

³ For a discussion of the use of harmonic proportions in late Kushite architecture see Hinkel 1989; 1991; 1997. This essentially involves the use and repetition of a rectangle with these proportions in a structure's design (Hinkel 1991, 221). For a discussion of its use in Dangeil's kiosk in the peristyle court see Anderson and Salah Mohamed Ahmed 2008, 41-42.

⁴ A processional relationship between the Amun temple and the structure (presumably a



of fired bricks and mud mortar and constructed in the same fashion as the statue plinths found in the temple's peristyle court. Fragments of scale-shaped fleece from ram statues were also found around and over the IK plinths, and traces of blue pigment on the fleece suggest that these statues may have been similar in appearance to those found in the peristyle court.

A large construction platform (c. 9.1 x 1.90-3.7m x 70-80mm thick) that had been used for the preparation of plaster and mortars was uncovered to the north of the kiosk (IK) (Plates 7 and 10). This feature was immediately recognised



Plate 8. Painted sandstone cornice from Kiosk IK.

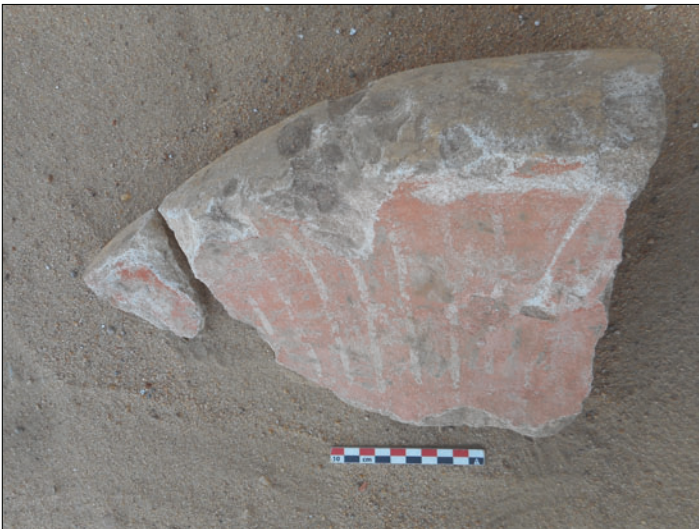


Plate 9. Painted sandstone capital from Kiosk IK.

temple yet to be excavated) within Kom A situated to the south southwest (Figure 1), may be postulated. This may be similar to that found at Jebel Barkal between temples B500 and B700 as suggested by the inscribed barque stand found in B700 for Amun of Napata (B500). Further evidence to suggest that the god Amun travelled in his barque processing around the sacred landscape may be found on blocks from the temple at Sanam Abu Dom. See further Griffith 1922, 95-6, pls XXV, XXVII; and for discussion see Anderson and Salah Mohamed Ahmed 2008, 43-44.



Plate 10. Construction and mortar preparation platform, facing southwest.

by the local workmen and builders on site. Numerous sherds reused as plastering applicators were found as was a large jar base reused as a palette (8/19S). The plaster remaining in the palette displayed finger marks. Four moulded, round, plaster objects (c. 150mm in diameter x 30-45mm thick) came from fill in the kiosk area. They had been painted yellow with details marked in red. These were remnants of the building's decoration and were either sun discs, or possibly clappers held by a queen or goddess (Plate 11). If large areas of the building had been covered with moulded plaster, this might partly account for the enormity of the construction platform. Moulded plaster of late Kushite date, for example, has been found at the Amun temple in el-Hassa where a large painted, moulded plaster fragment depicting a part of a queen holding a round clapper or similar object was uncovered.⁵

A circular pit beneath the floor in the southwest corner housed a sealed foundation deposit of 21 small, wheel-made, close-mouthed globular vessels with cut bases (diameter 40-50mm, height 20-30mm), a purposefully broken jar and two fist-sized lumps of unfired clay with hand marks (78/18) (Plates 7 and 12). Within the temple's sacred enclosure, the same type of vessel was found in temple LT, an ancillary temple south of the Amun temple (Anderson *et al.* 2018b, 67). They were also found at Naqa in Temple 700. The other ceramics found in Temple 700 were those typically associated with buildings of Amanitore and Natakamani, and a recent C14 analysis of charcoal associated with the vessels gives a date between 57 BC and AD 71 (K. Kroeper pers comm.). Similar pots have also been found at Wad Ban Naqa, again associated with structures of Amanitore and Natakamani (P. Onderka pers. comm.).

Kom G

Recently, excavation began on Kom G, a mound situated just north of the Amun temple's peristyle hall. Kom G is the highest mound on site, standing about 4.5m high and covering

⁵ J. Anderson is grateful to G. Nogara (Field Director, el-Hassa) for showing her this fragment in 2016.

an area of about 23.5m x 26.5m (Figure 1). Mudbricks, fired bricks and white lime plaster were visible on the surface and there was little pottery. When excavation began, the expectation was that an altar with a ramp leading up to it would be uncovered, as has been identified on late Kushite sites of similar date for example, as at Naqa in front of the Amun temple (Wildung 1999, fig. 46), Hamadab (Wolf 2015, 115-117, pls 1 and 2), Awilib (Borowski and Paner 2005, 55, figs 15 and 16) and in the dromos at el-Hassa (Rondot 2018, figs 1 and 2). Such a feature is also depicted in relief on the west side of the lower podium of the Sun Temple at Meroe (Meroe 250) (Hinkel 2001, 234-235, figs 82, 84). However, as excavation progressed it became evident that the structure being revealed was not rectilinear but was round (Plates 13 and 14).

It is a large round building, 15m in diameter and currently standing about four metres high, although the ancient ground surface has not yet been reached. The wall has a mudbrick core faced on the exterior with lime plastered, fired bricks,



Plate 11. Moulded plaster decoration from Kiosk IK.

which is similar in construction to the walls of the Amun temple and there appears to be a door, as yet unexcavated, on the west side. The bricks utilised are the same size as those used in the temple (340-360 x 180-200 x 80-100mm).

The roof is possibly a corbelled dome of mudbrick that appears intact in places although there is a large hole visible in the centre at the apex (Plate 15). Each horizontal course of brick visible on the building's extrados is cantilevered slightly until the concentric courses meet in the centre. Wooden beams, approximately 100mm in diameter, which had been inserted crosswise through the wall, tied the mudbrick wall core and dome together. They were regularly spaced, vertically every five courses and horizontally every two to three bricks depending on their relationship to the apex of the roof. The spacing becomes closer together as the apex is approached. It is not yet certain if a dome starts at the structure's base or if the base is a cylinder from which a dome springs, though the latter seems more probable as this would provide the



Plate 12. Foundation deposit in Kiosk IK with small globular vessels visible in situ.

resistance required to prevent the collapse of the dome. The original height also remains unclear; however, based upon the current preservation of the extrados and presumed ancient ground level, the structure would not have stood much more than five metres high when extant.

The round structure and the north wall of the peristyle hall of the temple are very close together. At the haunch section of the wall (approximately halfway between the base and the top), these walls are separated by less than 200mm and it is not inconceivable that when the ancient surface level is reached these features will touch. It is odd that both the round structure and the external north face of the temple



Plate 13. Round building in Kom G at the end of excavation Spring 2019, facing southeast.



wall were lime plastered. It is probable that the round building was constructed before the north wall of the peristyle court simply for reasons of ease of construction. After further excavation, it will be interesting to learn more about the extent of the plaster on each of these walls.

Apart from small silos, round buildings have been noted in Kush throughout time and usually have been associated with expressions of indigenous culture. For example, there are circular structures created by wooden posts such as one of medieval date found at Soba East (i.e. MN11, (48) (Welsby 1998, 22, 23, fig. 3)). Some examples of circular structures with mud and brick components include, from the Kerma period (2500-1500BC), the 'Great Hut', at Kerma, a combination post and mud building which has been postulated as the audience hall of the kings (Bonnet 1990, figs 32 and 28, pl. 27). Later during the colonial pharaonic period at Amara West, a rounded building (E12.11) dated to the late 19th-early 20th dynasties was found amongst the rectilinear structures. Its function is uncertain (N. Spencer, pers. comm.). Yet a further example, possibly a temple, dated mid to late 6th century BC (after the reign of Aspelta), comes from Dokki Gel (Bonnet and Valbelle 2010, 47, fig. 39). Many round buildings, ranging from pharaonic to late Kushite in date, have been reported at Dokki Gel, of which this is just one illustration.

There is an unusual round building (WBN 50) at Wad Ban Naqa provisionally dated to between the 3rd and 1st centuries BC (Onderka and Vrtal 2013, 74). It is this building which is the closest parallel to the Dangeil structure. As described by W. Y. Adams, this building is one of three 'enigmatic monumental buildings' from the Kushite period.⁶ WBN 50 was excavated 1958-1959 by a Sudanese mission led by Thabit Hassan Thabit, further investigated by Friedrich Hinkel in



Plate 15. Close-up of structure with the stepped brick courses clearly visible.

the early 1980s, and then re-excavated by the Czech mission in 2009, 2010 and 2013 (Vercoutter 1962, 273-277; Hinkel 1984, 300; Hinkel and Sievertsen 2002, 76). Pavel Onderka and Vlastimil Vrtal have published a good description of this structure and evaluated the various theories regarding its function, ranging from silo to shrine, so these will not be repeated here except for comparative reference to Dangeil's Kom G structure (Onderka and Vrtal 2013, 67-74).

With a diameter of 18.3m, WBN 50 is slightly larger than Kom G. It currently stands 2.7m high and has a ramp or staircase a little over a metre in height that led up to an entrance on the west side. The physical construction of WBN 50 is the same as the Dangeil building, although a ramp has not yet been uncovered in the latter. WBN 50 has a red brick exterior facing and a mud brick core, with wooden ties spaced throughout the brickwork. The exterior was lime plastered. No trace of roofing was recorded and it is uncertain whether any was present at the time of the original excavation. The circular room in the centre was reached by two internal staircases and no trace of wall plaster remained. Little was recovered from the interior, though a fragment of sandstone may have formed part of an altar. Onderka and Vrtal noted that WBN 50 was orientated towards the Isis Temple (WBN 300). They postulated that the function of the two buildings was related and WBN 50 was most likely a shrine with a unique architectural form (Onderka and Vrtal 2013, 74).

An object that might aid in understanding this structural form is a small domed, sandstone shrine or naos (625 x 592mm), excavated from the Jebel Barkal Amun temple B500 by G. Reisner in 1916, now in the Museum of Fine Arts, Boston (MFA 21.3234). The dome of the shrine springs from a cylindrical base. Above the base, the dome is divided into three inscribed horizontal registers. The lowest register depicts a series of lotus flowers, much like the wall painting found on the Dangeil temple's gate discussed above. The central register shows the king on both sides of a doorway in an attitude of praise, followed by a winged goddess, and then this is repeated. On the back of the shrine, this register bears



Plate 14. Kom G building from above
(orthophoto: R. Hadjuga).

⁶ The other two are the Great Enclosure at Musawwarat es-Sufra and a bastion at Qasr Ibrim (see further Adams 1984, 266-267).

the name of King Amanakhareqerema who reigned after Natakamani and Amanitore at the end of the 1st century AD (AD 80-90) (Rondot 2018),⁷ and whose name is inscribed on the ram statues associated with the Amun temple at el-Hassa. The chamber within has a socket for the attachment of a figurine, possibly seated. The uppermost register is decorated with a row of drop pendants above which are a series of ever smaller concentric rings of discs. There appears to have been a finial, now missing, at the apex. It has also been suggested that this shrine is a model of Jebel Barkal based upon its similarity to the hieroglyphic representation of the mountain as a dome and to reliefs depicting Amun enthroned within the mountain (Kendall 1997, 270-272, no. 288).⁸

A prominent round structure (B 2200), approximately 12m in diameter, was detected by a magnetometer survey conducted at Jebel Barkal in 1989. This feature is located northwest of the palace of Natakamani and Amanitore (B 1500) and several other contemporary late Kushite structures variously interpreted as temples or kiosks (B 1800; B 1900; B 2000). At the time, it was suggested that B 2200 appeared similar to WBN 50 and it was postulated as being a well or a dome-shaped tomb (tholos). No date for the structure was put forward (Kendall 1994, 142-143) and it remains unexcavated.

In light of sandstone shrine MFA 21.3234, Kom G's position within the sacred temenos of the Amun temple at Dangeil, and its round shape, it seems not inconceivable that the Kom G building may have been an indigenous Kushite shrine to a local god. Many Kushite gods, like Amun, are familiar from the Egyptian pantheon but little is known about Kushite religious beliefs before their conquest of Egypt in the mid-8th century BC and many of their indigenous deities, associated rituals and temples remain enigmatic. Further, given the analogous structure WBN 50 at Wad Ban Naqa and also potentially at Jebel Barkal, it might be suggested that while these round structures may have had a historical non-brick antecedent, the fired and mud brick manifestation of these circular features was introduced by Natakamani and Amanitore. This hypothesis is based upon the close spatial association between the round features and buildings, particularly sacred ones, built by Natakamani and Amanitore, and on the similarities of the materials and construction techniques used across all of these structures (with the exception of a dome). The use of domes is very uncommon both in Sudanese and Egyptian architecture before the Late Antique (Egypt) and medieval (Sudan) periods. A few examples do exist such as may be found at Sedeinga, where some Kushite pyramids (i.e. Sector II, T. 232) had been constructed with an infrastructure that included a corbelled dome (Rilly and Francigny 2013, 63, fig. 2) but these are small in size. The earlier domes largely tend to be associated

with funerary contexts.⁹ Although the technology existed, no brick dome precursors similar in size to Kom G or WBN 50 have been as yet identified in the Nile valley and while it remains uncertain, these Kushite structures do not appear to be funerary in nature based upon the existing evidence. The method and technical skill required for constructing a large-scale corbelled dome would need to have arrived fully developed, and its use, should these buildings have been domed, limited.

Conservation and Site Protection

Extensive conservation work has been undertaken with the aim to preserve, conserve and protect Dangeil for the future and to make it accessible to visitors through the creation of an archaeological park.¹⁰ Each season conservation work carried out in previous seasons is reviewed and evaluated. Site management and accessibility are being addressed together with the local village and NCAM. The site is enclosed by boundary posts, streetlights were installed, a public transit stop and information point built. One issue that the mission struggled to address was enabling visitors to view the carved columns and panels in the sanctuary area of the Amun temple, while also keeping these features secure and protected from destructive natural elements and anthropogenic factors. The facings and columns were conserved, and from 2003 until November 2018 had remained within temporary sealed protective structures. Following consultations with NCAM, conservators, architects and builders, it was decided to roof the sanctuary area, approximately an 18 x 16m space (Figure 2).

The sanctuary shelter was constructed by a professional team of builders from NCAM supported by builders from Dangeil village. It has a zinc and fibreglass roof and drainage pipes which are supported by cantilevered steel beams and fired brick walls. The structure is removable. The fibreglass panels provide natural lighting which changes over the course of the day as the sun moves, casting different light and shadow on the reliefs (Plates 16 and 17).

Acknowledgements

The Berber-Abidiya Archaeological Project is very grateful for the assistance and support we have received from many different people, projects and institutions and particularly, the National Corporation for Antiquities and Museums, Sudan, Qatar Museums, The Qatar-Sudan Archaeological Project, the British Museum, the Institute for Bioarchaeology, Dr D. Bird and the people of Dangeil village.

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⁷ As dated by Claude Rilly in Rondot 2018.

⁸ See also Museum of Fine Arts, Boston, <https://collections.mfa.org/objects/144530>.

⁹ For a discussion of domes and corbelling in the Nile valley along with examples and sites see Arnold 2003, 62-63 and Spencer 1997, 126-127.

¹⁰ For the principles and theory behind the conservation programme at Dangeil see Anderson *et al.* 2014.

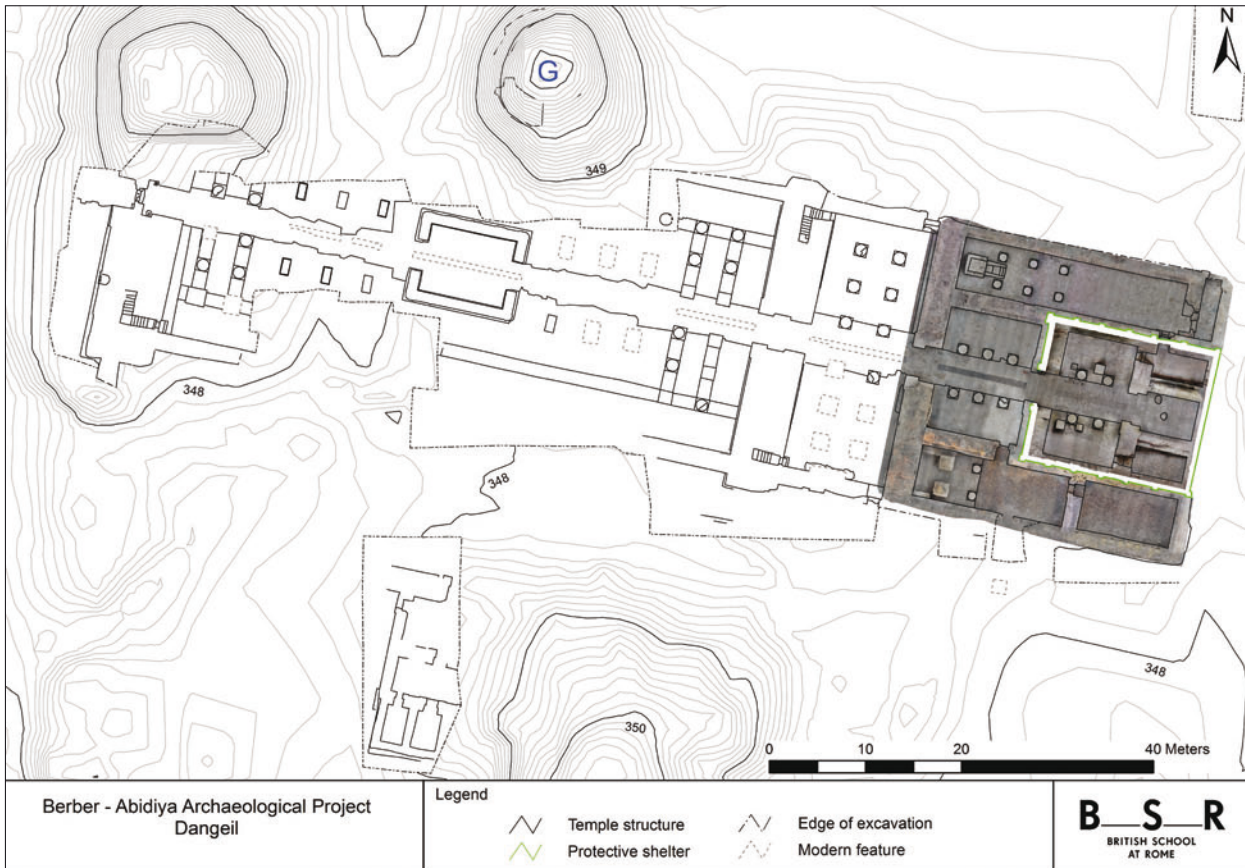


Figure 2. Dangeil temple plan with sanctuary and area of the protective shelter indicated.



Plate 16. Amun temple sanctuary area within the protective shelter, facing east towards the sanctuary.



Plate 17. Amun temple sanctuary area within the protective shelter, facing northwest.

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