

Kirwan Memorial Lecture

The Qatari Mission for the Pyramids of Sudan – Fieldwork at the Meroe Royal Cemeteries – A Progress report

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The Royal Cemeteries of Meroe and the QMPS – An Introduction

In 2014, Qatar Museums started the Qatari Mission for the Pyramids of Sudan (QMPS) to revive research and conservation at the royal cemeteries of Meroe. This ambitious project aims at archaeological, architectural and culture-historic investigations combined with the preservation and presentation of this World Heritage site.¹ While the introduction to the QMPS and first project results were reported in *Sudan & Nubia 20* (Riedel *et al.* 2016), the Kirwan Memorial Lecture in September 2017 and the present article focus on the project's progress since the summer of 2016. Significant milestones in several key aspects of the mission's program have been reached during these two years. Archaeological research and documentation at Queen Khennuwa's tomb Beg. S.503 as well as the iconographical and epigraphic studies of its burial chamber decoration have been completed and the post-excavation analysis started. After the implementation of the first technical safeguards to prepare for the re-excavation of pyramid tomb Beg. N.9, its burial chambers have been reopened (see Murtada Bushara Mohamed and Mahmoud Suliman Bashir, this volume). The architectural and iconographic documentation of the Begrawiya North and South cemetery pyramids and their offering chapels has been completed in the field and the collection, inventory and preliminary documentation of more than 1000 ornamented blocks that were found divorced from their original context have been achieved. In the fields of conservation and preservation an important step was reached by the preparation of a general conservation and preservation strategy for the pyramids and their chapels. Meanwhile, its implementation started at both cemeteries. Furthermore, the

¹ QMPS closely cooperates with the National Corporation for Antiquities and Museums (NCAM) in Khartoum and the German Archaeological Institute (DAI) in Berlin. The two sub-projects are coordinated by Mahmoud Suliman Bashir (NCAM) and Alexandra Riedel (DAI).

development of a sustainable tourism plan for Meroe and the 'Island of Meroe' was finalised and the implementation of necessary infrastructure such as an improved site entrance, a visitor centre and site boundaries has begun. Last but not least, the digitization of the Friedrich-Hinkel Research Archive at the German Archaeological Institute (DAI) in Berlin has been completed and the archive is now accessible online, and the digitization of the architect's archive at NCAM in Khartoum has been started.

Re-excavation and documentation of selected pyramid tombs

In 1921-1923, the Harvard University-Boston Museum of Fine Arts Egyptian Expedition under the direction of G. A. Reisner undertook a tremendous endeavour by excavating all known royal tombs and commoners' graves at the three royal cemeteries of Meroe. In only three seasons lasting altogether 12 months, more than 1,250 pyramids, mastaba tombs and pit graves were completely excavated by Reisner's Egyptian Quftis, which were led by his highly experienced foreman Said Ahmed, and not less than 100 local workmen (Plate 1). The



Plate 1. The Harvard University-Boston Museum of Fine Arts Expedition excavations in Meroe; tombs Beg. N.12 and 13 (Photograph © 2018 Museum of Fine Arts, Boston).

short time for archaeological and epigraphic documentation that Reisner and his few assistants, many of whom changed every season, had at their disposal, hints at the not always perfect quality of their records. For instance, the excavation diary reports that pyramid Beg. S.503 was excavated and documented in just five days, from 12th to 16th January 1922, alongside other expedition tasks.²

Amongst the 142 identified royal pyramids, burial chamber decoration was discovered in only three tombs – Beg. N.9, Beg. S.10 and Beg. S.503. However, Reisner and his staff

² Dunham summarises these days: 'A few more tombs in the South Cemetery and the large Queen's Pyramid in the wadi between the North and South cemeteries (Beg. S. 503) were excavated from January 12 to 18. A preliminary survey of the West Cemetery was made on January 15, and on January 19, excavation of this site was begun and digging at the North Cemetery was terminated' (Dunham 1950, 9).



recorded them very poorly with only a few photographs and a number of inaccurate and sketchy hand drawings. The photographs covered just small parts of the decorated walls and the hand drawings were never fully published.³ Because of these factors, the inscriptions and paintings of these tombs remained poorly recorded and a thorough epigraphical and iconographical evaluation was hitherto impossible. This unfortunate situation was one of the reasons that led QMPS to consider the re-excavation and re-documentation of these three important tombs and to evaluate the possibility of permanently reopening their substructures for public access.

Pyramid Beg. N.9, excavated by Reisner between 21st March 1921 and 17th January 1922, is one of the best-preserved pyramids in the cemetery. It is generally assumed to belong to King Adikhalamani (generation 39), a contemporary of the Upper Egyptian revolt in 207/6-186 BC.⁴ Since Beg. S.503 and Beg. S.10 both date to the Napatan period and were made for non-ruling queens, the preserved paintings of this tomb represent the only known Meroitic royal burial chamber decoration: the rock-cut coffin-bench bears a painted relief representing the king and various deities as well as scenes of the king's mummification (Dunham 1957, 66 and pl. xxiii B-C). Completing the chamber's decorations are paintings on the ceiling and the walls, amongst them a sun barque (Dunham 1957, 66 and fig. 38). In the original fill of the stairway Reisner recovered 'decayed wooden logs, varying in length from 1.60 to 4 m. and 15 to 22 cm. thick' (Dunham 1957, 66 and fig. 37). Finding even small fragments of this non-fibrous wood,⁵ probably cedar from the Near East, would be instrumental for dating the grave by radiocarbon analysis and possibly even by dendrochronology. During the last days of March 1923, Reisner deposited pottery and artefacts which he did not ship abroad in the tomb's burial chambers.⁶ Modern scientific approaches and present-day analytic methods can now use such objects to reveal many new insights into the Kushite past. At a time when the Meroe region was barely under any official control, Reisner's decision to store these

³ Some of the hand copies made by Reisner and/or Dunham in the burial chambers of tomb Beg. S.503 were found by T. Kendall in the written archives of Dunham and were published by J. W. Yellin in 1984. Further copies found by Yellin in the archives of the Boston Museum of Fine Arts will be published in the first volume of the series *Necropolises of Kush I* (Hinkel and Yellin forth.). The sections in the present article related to the funerary decorations and inscriptions of Beg. S.503 are based on new results of the QMPS fieldwork and also consider the state of research in *Necropolises of Kush I.1*.

⁴ Dunham 1957, 66f; Eide *et al.* 1996, 590f [nos 130f]; Török 2015, 72f. Cf. also Rilly 2017, 225-228.

⁵ As the field diary for 1st April 1921 states. However, the logs were removed during excavation.

⁶ The excavation diary states: 'Mar 30. 1923. Stored unwanted pottery and other objects of no museum interest in chambers C and B, and blocked up both these doors with sandstone masonry. A bottle containing a paper with the date and circumstances and names of the members of the Expedition was sealed up with the objects. March 31. 1923. Filled room A with discarded antiquities and sealed door at foot of stair with sandstone masonry. Started refilling stair.'; see also Dunham 1950, 10.

objects in the burial chambers of Beg. N.9 was certainly based on deliberate consideration: 10m below ground, these burial chambers are still the most secure places in Meroe and even today it is not a trivial task to access them. After deposition of the finds, he backfilled the stairway with numerous sandstone blocks. Only major public institutions with extensive funding would be able to access safely the largest corpus of grave goods from the Kushite royal cemeteries still present in the Sudan.

The excavations of QMPS, begun at the tomb's staircase in the autumn of 2015, revealed, however, serious structural problems in the surrounding bedrock: large holes were washed out by percolating water under the south-western corner of pyramid Beg. N.18 (Dunham 1957, 146-153), which had been erected for Queen Amanikhatashan at the edge of that stairway three centuries after Beg. N.9.⁷ Therefore, a concrete ring with crossing beams was inserted into the upper part of the stairway as a preliminary stabilisation measure in the 2016/2017 season⁸ to prevent a collapse of the stairway walls under the weight of pyramid Beg. N.18. This thick, reinforced, steel construction (up to 2.5m high and about 300mm thick) interlocks with the surrounding rock. Respecting the visual integrity of the World Heritage site, only a small concrete ring is visible on the ground surface level (Plate 2). Installations to allow public access, such as a



Plate 2. The concrete ring supporting the staircase of Beg. N.9 to prevent a collapse of the stairway walls under the weight of pyramid Beg. N.18, shown during construction in January 2017 (© QMPS, P. Wolf, 2017).

roof and a staircase, were considered during implementation. This measure allowed the re-excavation to continue, but unfortunately, unstable bedrock at a lower level necessitates

⁷ Already Reisner had to introduce temporary security measures in the weak rock surrounding the staircase. His diary of 3rd April 1921 reports: '... fragments began falling from the south side of the stairway from the top of the second stratum, a streaky clay. So [he] withdrew locals until a prop could be put in. But Egyptians continued breaking up the debris at the west end (thieves' debris and washed debris).'

⁸ Developed in cooperation with the structural engineering consultant J. Steiner and implemented by the construction division of NCAM under the supervision of T. Bunk (Klessing Architects, Berlin).

additional structural stabilisation. The re-excavation of the tomb meanwhile succeeded in the spectacular re-opening of its burial chambers by the QMPS-NCAM project division, which is reported in the article by Murtada Bushara Mohamed and Mahmoud Suliman Bashir elsewhere in this volume.

Re-investigation of Tomb Beg. S.503

Pyramid Beg. S.503, the tomb of Queen Khennuwa, was chosen for re-excavation and re-documentation in December 2015. Before the excavations of Reisner in 1922, the tomb's significance was hardly noticed. E. A. W. Budge wrote: 'At the western mouth of the valley are the ruins of a pyramid of a very late date; it is unimportant, and except for its connection with the Southern Group would not have needed mention' (1907, 416). Our fieldwork involved the excavation of its staircase and the documentation of its burial chambers by a thorough cleaning of their floors, the recording of the scattered coffin bench blocks, the collection of small finds and pottery, and systematic photographic recording of the chambers and their decoration in normal and UV-light that yielded high-resolution photographs and permitted the preparation of exact 3-D models by 'Structure for Motion' (cf. Riedel *et al.* 2016, 68-70). A conservation analysis was undertaken and a large number of samples of materials including charcoal, wood, pigments and plaster were taken for scientific analyses. After completing the re-documentation of the substructure in March 2016, it was decided to block the tomb again and to backfill its stairway. Apart from the structural instability of the surrounding bedrock, the conservation analysis indicated that the chambers, and particularly the plaster and paintings, would hardly survive visits by tourists without complex and

the architecture, relief imagery and graffiti.¹⁰ Two trenches were dug into the pyramid's rubble fill to retrieve data on its internal structure. The re-documentation was completed in December 2017 following excavations in the tomb's immediate vicinity (Plate 3).



Plate 3. Excavations at pyramid Beg. S.503 in December 2016
(© QMPS, P. Wolf, 2016).

The Archaeology of the Tomb

The tomb is located about 120m west north west of the South Cemetery's hilltop ridge. At this location, on the slightly elevated southern bank of the *wadi* between the two cemeteries of Begrawiya North and South, the subsoil consists of three major geological strata (Plate 4). The

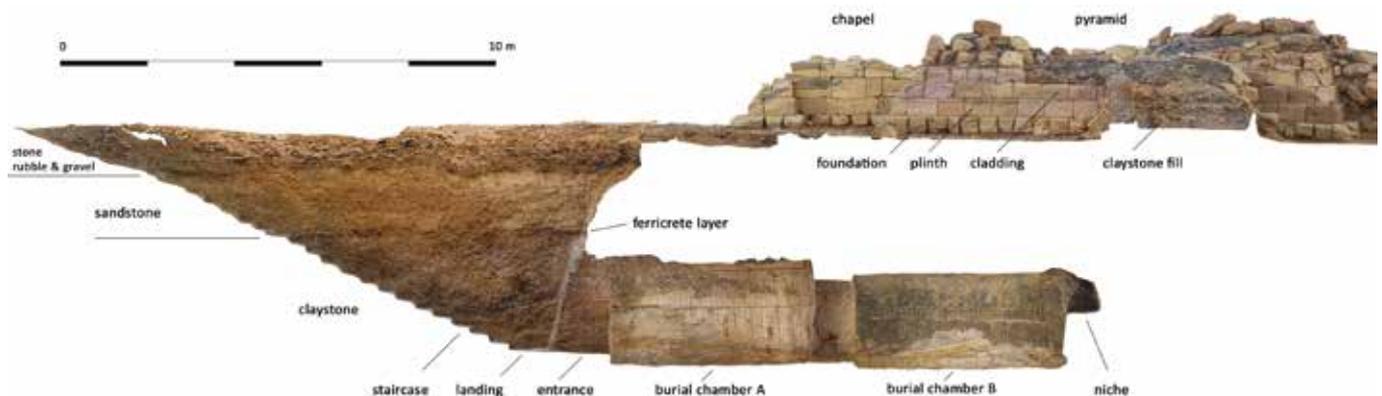


Plate 4. East-west section through tomb Beg. S.503 (© QMPS, P. Wolf, 2018; 3-D model by P. Wolf and A. Rodenwaldt, 2016).

extremely expensive conservation measures and technical safeguards.⁹ In the 2016/17 season, the pyramid and the chapel were cleared to prepare for detailed recording of

1m thick topmost stratum is a loose mixture of eroded sandstone debris with numerous black-patinated ferricrete stones and pebbles. It rests on a 1.5m thick stratum of a soft yellow to reddish sandstone, which is separated by a thin ferricrete stone layer from a several metre thick horizon of very soft, pale-white to violet kaolinitic claystone – an argillaceous rock with kaolinitic binder matrix and quartz

⁹ Different proposals to present the burial chambers to the public are under discussion including a new approach, which would be unique in Sudan and Africa: the reproduction of an accurate 1:1 model of the burial chambers on the basis of the 3-D model to be presented in the Wadi Tarabil Museum.

¹⁰ The relief remains in the mortuary chapel, which F. W. Hinkel was able to record in 1993, are completely gone.



sand interspersed with yellowish ferric oxides and calcite-rich inclusions.¹¹

The tomb's 12.5m long stairway of 25 steps¹² cuts through these strata down to a small landing at a depth of 5.2m. As Reisner noted elsewhere in the Meroe royal cemeteries, the burial chambers were quarried into the rock beneath the hard and relatively stable ferricrete layer. The stairway is oriented 90.5° east and its western end is located well in front of the chapel (Plate 5; cf. Dunham 1950, 126, Reisner 1923a, 50f).

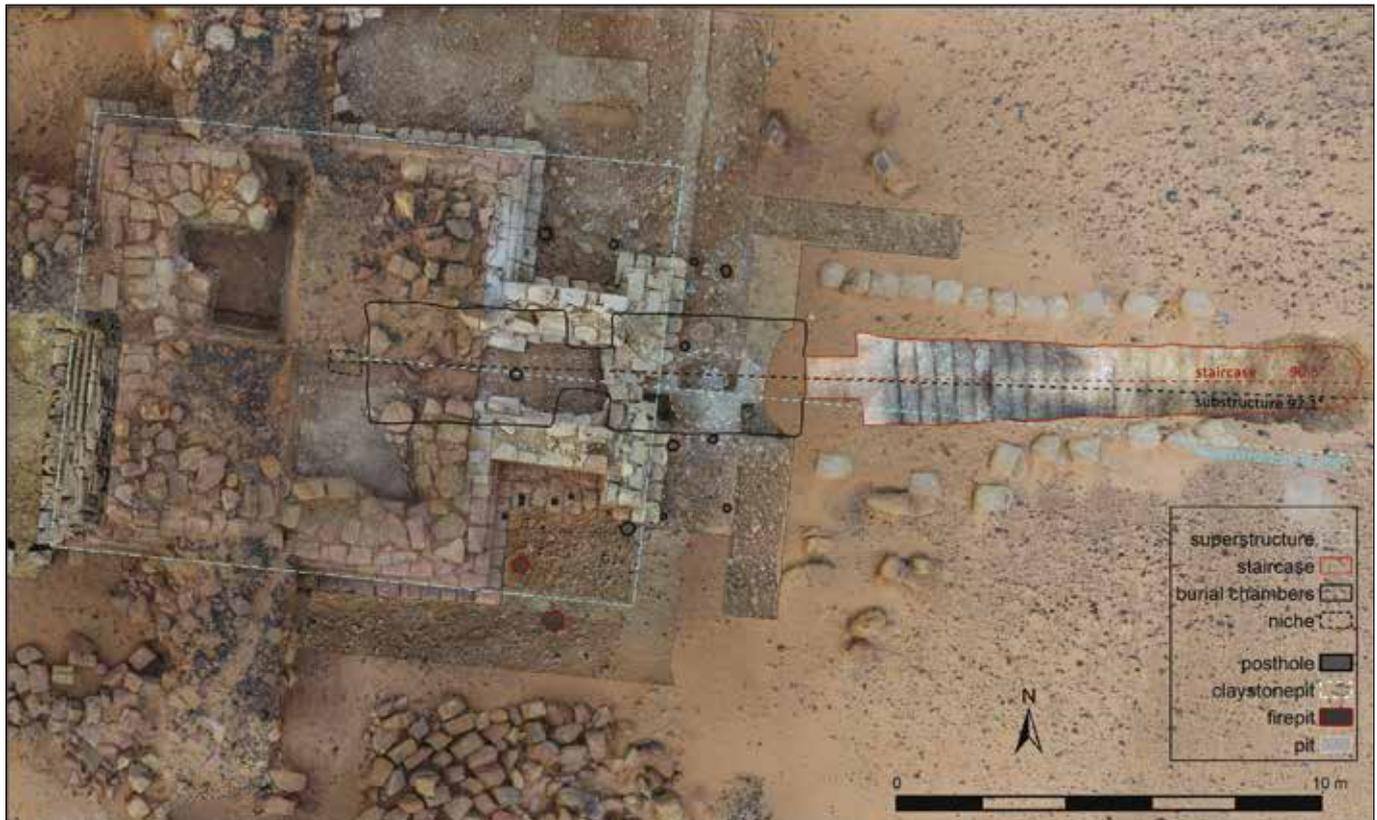


Plate 5. Ortho-photographic plan of tomb Beg. S.503 combining various stages of its excavation (© QMPS, P. Wolf, 2018; 3-D model by P. Wolf, A. Rodenwaldt and L. Jansen, 2016-2018).

While its inclined side walls were left roughly cut, the outer face of the doorway to the burial chambers was decorated with an unfinished cavetto cornice and framed by dressed mouldings (Plate 6).¹³ The cornice is damaged by a grave robber trench that led directly into the entrance of the grave. The burial chambers correspond to Reisner's type VB with a vaulted roof of type IV and each forms a 92.1° east oriented rectangle of almost equal size: 4.55 x 2.8m and 4.55 x 2.75m respectively. A single step without a threshold leads down into each chamber.

¹¹ The petrological analysis was carried out by the Amtliche Materialprüfungsanstalt der Freien Hansestadt Bremen.

¹² Length measured along the stairway; the steps in the upper sediment rubble are completely worn. Dunham counted, therefore, just 23 steps and notes a short slope at the top (1957, 37).

¹³ It was apparently mis-seen by Reisner and/or Dunham, who recorded a round-topped plain doorway of type I (Dunham 1957, 37). With cornice, the doorway corresponds to type III (cf. Dunham 1950, 128 and chart II).

Careful cleaning of the chamber floors revealed a slight depression along the walls of the antechamber (A) and a shallow 'E'-shaped trench in its centre. Post-holes had not been recorded. The floors were partially covered with a thin layer of clay mortar fall, deposited during the chambers' plastering. Tiny pieces of charcoal were found embedded in these plaster remains. When Reisner opened the tomb in 1922, the complete set of eleven plastered coffin bench blocks was already scattered in the burial chamber (B). According

to the distribution of the plaster remains on the floor, the bench must have been centrally located with its rear side *c.* 750mm in front of the chamber's west wall into which a vaulted niche of 850 x 570mm was roughly cut at the height of 1.2m above the floor.

The superstructure is a rubble-filled pyramid with stepped courses and plain corners corresponding to Reisner's type IX (Dunham 1957, 37; cf. 1950, 122 and chart I on p. 123). It is oriented 95.65° east, has an inclination of roughly 62° and measures at the base of its plinth course *c.* 10.33m east-west x 10.41m north-south. The location of the tomb, neither disturbed by any structures in the neighbourhood, nor hampered by irregularities in the bedrock, permitted the Kushite builders to construct the tomb exactly according to their ideal plan. It is probably not incidental that a virtual perpendicular line, dropped from the centre of a rectangle comprising the pyramid and the chapel, precisely hits the main axis of the burial chambers at its intersection with the niche in the rear



Plate 6. Entrance to the burial chambers of Beg. S.503. The remains of the unfinished cornice are visible to the left and right of the doorway arch (© QMPS, P. Wolf, 2016).

wall of burial chamber B – aligning the tomb’s substructure with its superstructure (cf. Plate 5).¹⁴ The clockwise changing orientations of the tomb’s staircase, the burial chambers and the superstructure by 1.6° and by 3.55° indicate that these axes were aligned on celestial objects. At the present state of research we can only speculate on the explanation of this evidence. In any case, the re-documentation of Beg. S.503 resulted in a number of differences to the plan published by Dunham (1957, 38 fig. 15) and shows that, without reviewing Reisner’s data, studies associated with the measurements of Kushite pyramids can hardly be exact.

A 200-350mm high foundation block layer supports the pyramid’s cladding masonry as well as the chapel walls and the pylon (Plate 7). These roughly hewn foundation blocks

project c. 300mm from the plinth, the first course of dressed cladding blocks, and form a small platform to the south of the chapel. Apparently, they were set directly onto the subsoil, since we did not note any remains of sand or mortar beneath them, as was recorded by Hinkel at several pyramids in the North Cemetery (Hinkel 1982, 33). On top of the plinth, that has an almost vertical inclination, up to five courses of battered blocks are preserved. They step back for 80mm per course as is indicated by fine guidelines scratched into their horizontal faces. The cladding is supported inside the pyramid structure by strong supporting masonry of two rows of roughly hewn sandstone blocks 1.3m thick and some unfinished column drums that apparently were rejects from the stone quarries (Plate 8). The wide joints of this masonry were sealed with a fluid mud mortar. The 1.1m thick chapel walls and the slightly thinner pylon were executed in double shell masonry with stone rubble and earthen mortar core between the faces of dressed blocks. Remains of a temenos have not been recorded.

The interior supporting masonry of the pyramid rests on kaolinitic claystone rubble that obviously originates from the quarrying of the burial chambers (cf. Plates 4, 6-8). This kind of material is not available above ground in the neighbourhood of the pyramid and the evidence, therefore, clearly indicates that the construction of the superstructure followed the quarrying of the burial chambers (cf. Hinkel 1984, 326). Up to the height of 1.5m, most of the pyramid’s rubble fill consists of this claystone. It is not heterogeneously mixed, but its structure is reminiscent of a layer cake – clearly stratified by more or less self-contained horizontal layers that correspond approximately to the height of the sandstone block courses. The fill-material was, therefore, brought into the pyramid and carefully distributed layer by layer according to the setting of the pyramid masonry. Some sharper-edged sandstone debris within the lower fill layers attests to the concurrent masons’ work at the site. A 400-800mm broad pathway in the fill running along the pyramid’s main axis from the chapel towards the pyramid’s centre may have been a way

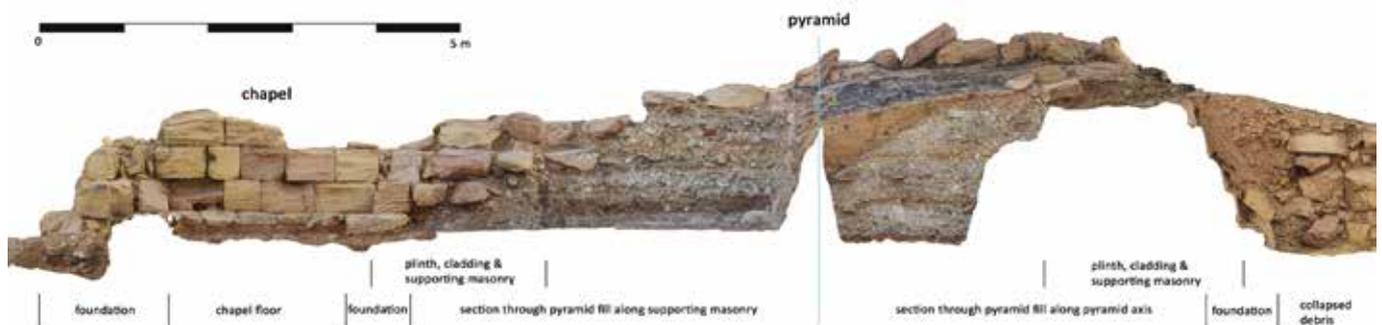


Plate 7. East-west section through the pyramid and the chapel of Beg. S.503 (© QMPS, P. Wolf, 2018; 3-D model by P. Wolf, A. Rodenvaldt and L. Jansen, 2016-2018).

¹⁴ Locating the centre of the superstructure exactly above the centre of the rear wall of the second burial chamber is possible by sight along a plumb bob dropped at the western end of the staircase, measuring the distance between this point and the west wall of the chamber and setting this distance out on top of the ground.

to enter the pyramid during its construction and to bring in masonry blocks and fill material (Plate 8, b). The centre of the pyramid was destroyed down to 750mm above the subsoil by a 5.5m diameter pit filled with wind-borne sand (cf. Plate 7,



Plate 8. The south-eastern excavation trench inside pyramid Beg. S.503: a – claystone fill of the pyramid body c. 200mm above ground level; b – pathway along the pyramid’s E-W axis; c – supporting masonry; d – double shell masonry of the chapel; e – reused column drum (© QMPS, P. Wolf, 2016).

right of blue central line). As is obvious from the preserved fill surrounding this pit and from the heaps of collapsed material at the foot of the pyramid, construction debris, sandstone and ferricrete rubble dominated in the fill layers above 1.5m.

Hinkel demonstrated the use of a *shaduf* to lift sandstone blocks and other building materials to higher levels during pyramid construction at Meroe (Hinkel 1982, 39-51; 2000, 19f). We did not find any wooden trunks of a *shaduf* or their post-holes within the pyramid, which suggests the use of the supporting masonry as a kind of staircase or external ramps to transport construction materials to levels of between 2-4m (cf. Hinkel 1982, 36-38). A 500mm deep pit, almost 2m in diameter, full of claystone rubble, was discovered next to the western end of the staircase in front of the chapel doorway (cf. Plate 5). It may represent a claystone-filled post-hole for a *shaduf* or a platform used to lift debris quarried from the burial chambers. We did not find any scaffold post-holes around the pyramid. However, a series of

200mm deep post-holes up to 400mm in diameter recorded 1-1.2m in front of the chapel walls and the pylon attests to the use of a scaffold during construction and decoration of the funerary chapel. Finally, two charcoal-filled fire pits 400mm in diameter were recovered next to the south-eastern corner of the pyramid. According to the radiocarbon age of charcoal samples taken from them, they are neither related to the construction of the tomb nor to the burial rituals. Instead, they may testify to the looting of the tomb during the later Meroitic period (see below).

The Burial Chambers’ Decoration and Funerary Texts

Since the re-blocking of the substructure in 1923, relatively few parts of the painted plaster had fallen, mostly near the northern and southern chamber walls. Their decoration was still preserved in 2016 to roughly three quarters of the way from ceiling to floor – exactly as Reisner must have seen it a century ago (Plate 9; cf. Riedel *et al.* 2016, pls 7-8). Apart from the bottom of the walls in the lower lying burial chamber B, which must have been eroded over a longer period of time by stagnant water (cf. Riedel *et al.* 2016, pl. 9), the only substantial rock damage was recorded on the walls and the ceiling near the entrance to the tomb. This certainly results from the air exchange at the interface between the chambers’ humid and constantly warm interior and the cooler and dryer exterior. This damage indicates that the chambers were left

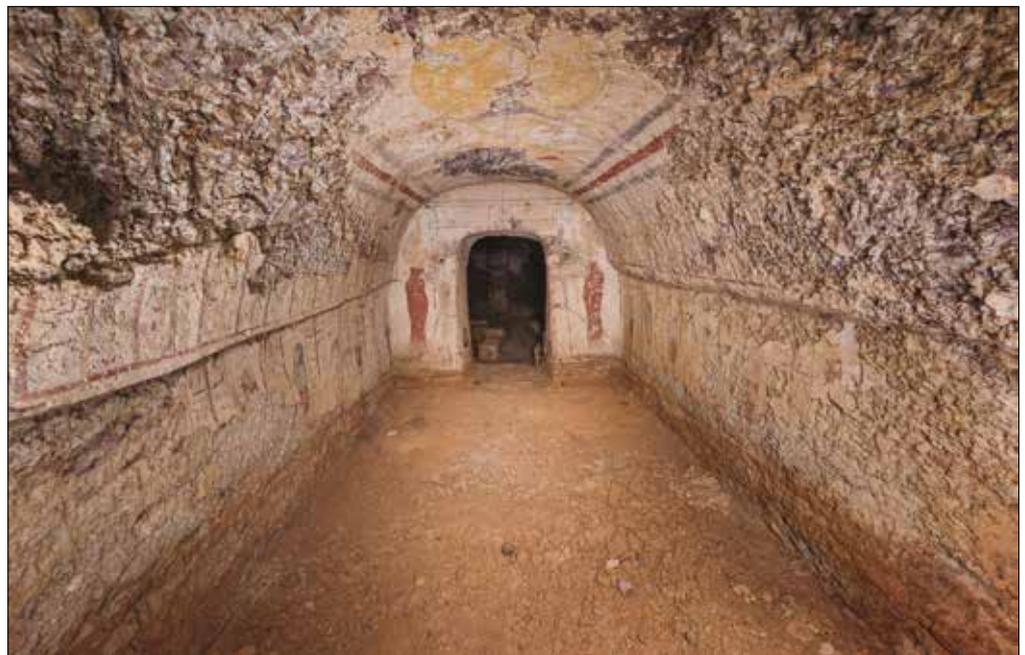


Plate 9. Burial chamber A of Beg. S.503 after the tomb’s re-opening in February 2016 (© QMPS, P. Wolf, 2016).

open for a long period sometime after their looting and before their excavation by Reisner. In January-March 2016, we recorded all walls and their paintings with high-resolution ortho-photographs under normal and UV-light. The UV-light photography substantially clarified the details of both figures and inscriptions. By combining Reisner’s and Dun-

ham's records with this new documentation, personal field notes and photographs,¹⁵ J. W. Yellin and J. Hallof completed their studies on the iconography and epigraphy of the burial chamber paintings.

Both chambers are decorated with Egyptian-style funerary texts and accompanying scenes. On the white plastered walls of chamber A, texts and figures are painted in bright colours – white, black, red, yellow and blue. Its north and south walls display vertical text columns in their upper zones and mummiform deities separated by text columns in their lower parts (Plate 10). Without any relationship to these deities, the texts represent standardised *htp-dj-nswt* offering formulae and

chamber into a northern and a southern hemisphere. As is indicated by the texts, the northern side was devoted to Khennuwa, while the southern half was devoted to Osiris. The ceiling vault and the upper parts of the north and south walls are covered by an astronomical text of the Senmut Family tradition – a family of texts first identified in the 18th Dynasty tomb of Senmut in Western Thebes and popular during the Ramesside and Saite Periods as well as in several Theban 25th Dynasty tombs. Clearly following forms, spellings and palaeography of its Egyptian templates, our text lists the names of decans, the epagomenal decanal stars and the planets. In that way the chamber's decoration represents



Plate 10. Ortho-photograph of the north wall in burial chamber A (© QMPS, P. Wolf, 2016; 3-D model by P. Wolf and A. Rodenwaldt, 2016).

inscriptions describing actions by Osiris in favour of the deceased. It is difficult to identify the deities depicted solely on the basis of their iconography. They represent a form of Osiris, perhaps magistrates found in Egyptian judgment scenes, as well as jackal-, human-, baboon- and hawk-headed gods – the latter possibly being the sons of Horus. The doorway into chamber B is decorated with a pylon and a winged disc cornice flanked by Isis and Nephthys (Plate 9 and Riedel *et al.* 2016, pl. 8). The goddesses have their traditional Egyptian headdresses, wear long red garments with thick white straps and offer funerary bandages to show that Khennuwa has passed through the Osirian judgment and had become Osiris herself. The chamber's ceiling is spanned by a figure of the goddess Nut and is filled with rows of five-pointed yellow ochre stars. At the eastern wall, only the legs of guardian figures are preserved on either side of the entrance.

In contrast to the bright and colourful chamber A, which represents the day, chamber B represents the night and the underworld. Texts and figures are executed exclusively by yellow ochre line drawings on an entirely black background (Plates 11 and 12; cf. Riedel *et al.* 2016, pl. 9). A cordon displaying the name and the titles of the queen¹⁶ divides the

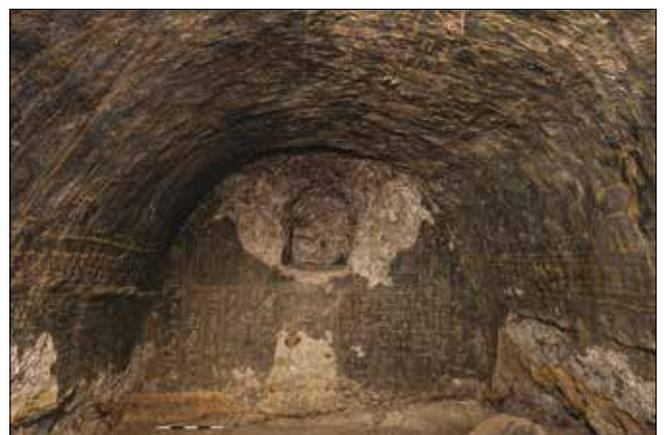


Plate 11. Burial chamber B in tomb Beg. S.503 (© QMPS, P. Wolf, 2016).

the cosmos as part of the night journey of the sun god Ra before his triumphal daily rebirth and was intended to guide Khennuwa on her descent into and through the underworld. On the north wall, the text frames representations of astronomical constellations, e.g. of Sothis and Orion, but does not refer to them. On the opposite, southern wall, eight lunar

¹⁵ J. W. Yellin was at Meroe when the burial chambers were re-opened in 2016.

¹⁶ The name of the queen appears in several different spellings in the tomb. With Kheñuwa, Reisner and Dunham had chosen one of the

most rare examples. According to the majority of them, her name should be read as Khenu-dua. It forms the Egyptian name *Hnw-dw³=w* with the meaning 'The offering-bearer is praised'.



deities, who represent various stages of the lunar cycle, are led by the Isis-crocodile – a goddess closely resembling the hippopotamus-headed Taweret with a crocodile in front of her (Plate 12). Despite being placed on the southern wall, these deities are nevertheless part of the so-called Northern Constellation. Below this procession, a hymn addresses Osiris, while the lower part of the north wall contains a speech of Osiris to the queen.



Plate 12. The south wall's upper panel in burial chamber B depicting deities of the 'Northern Constellation'. The upper ortho-photograph was taken in normal light, the lower one in UV-light (© QMPS, P. Wolf, 2016; 3-D model by P. Wolf and A. Rodenwaldt, 2016).

Reisner found the rounded niche in the centre of the west wall empty (Plate 11). Originally, it may have held a sculpture of an Osirian triad or a statuette of Osiris similar to the decoration of some of the Western Cemetery and Jebel Barkal West pyramid chapel walls. The shape and decoration of this wall recall that of a typical funerary stela with a rounded lunette having antithetic offering scenes depicting the queen and Osiris. The north side of this 'lunette' depicts the Queen showing the ample proportions also typical for later Meroitic queens. She wears a long mantle and stands in a gesture of adoration behind Osiris who sits on a block throne. In front of each Osiris, pedestal-base offering tables with wine jars stand on each side of the central niche. The Osiris represented on the south side of the niche sits on a block throne and wears a false beard and a *bembem*-crown. Two figures are represented behind him: Isis with a horned moon crown, who places her right arm on his shoulder, and a small female with arms raised in adoration, standing behind her. Two groups of vertical hieroglyphic inscriptions that mirror one another are written below each of these offering scenes. Dedicated to the queen, each set of these partially identical inscriptions contains her and Osiris' epithets. The east wall of the chamber is covered with vertical columns of text stating epithets of the Queen and offerings to be given to her.

Execution of the Burial Chamber Decoration

Plaster and pigment samples were analysed to better understand the techniques and materials used by the Kushite

artist(s).¹⁷ The walls of both chambers are covered with a simple clay plaster containing a little aggregate of fine-grained quartz sand. Its matrix is identical with the kaolinitic claystone quarried in the burial chambers – without the addition of any lime or organic binder: the workmen just ground kaolinitic rock varieties with a small mineral content and added as an aggregate some rock material with a higher content of quartz sand. The resulting plaster is very soft and according to a test carried out by our conservators, it dissolves immediately when it comes into contact with water.¹⁸ It was applied with a thickness of 10-20mm onto the roughly-cut chamber walls without levelling out larger rock outcroppings or specially smoothing the surface. Since the micro-climate in the burial chambers is characterised by moisture from the natural rock and little air circulation, we may assume that it took several days or even weeks to dry the plaster. Thereafter, chamber A was coated with a whitish primer of siliceous materials mixed with white clay (alumina) and chamber B was coated by a primer of carbon black.

Five different pigments were used for painting texts and scenes: carbon black, white lime (calcium carbonate), yellow and red ochre, as well as Egyptian blue (calcium copper silicate). They were tempered in water and applied directly onto the primer without the addition of any binder. Egyptian blue, used to create the light, dark and greenish-blue hues, was available through the local production of faience. The other pigments are naturally occurring in the region and were thus abundantly available. They were made by finely grinding colourful ochre varieties, for example, from the local sandstone quarries and by taking lime from calcretes in the subsoil. Carbon black was presumably produced by burning wood or other organic materials. In chamber A, these few pigments were applied using a deliberate pattern of alternations to maximize the visual impact of the limited palette.

Guidelines were then roughly laid out on the chamber walls and the figures were drawn freehand without planning or much hesitation: the drawings are simple, with long continuous brushwork outlines and only a few re-workings. In chamber A, figural outlines were painted first, the hieroglyphs were written and then figures were filled-in with colours. In chamber B, hieroglyphic signs were simply painted on the black background without any preparatory drawing, which shows that painter and writer was the same person. Specific grammatical features were often expressed by different writings on the different walls. This indicates that at least two artists were working in the tomb. It is noticeable that they

¹⁷ The samples were analysed at the Mikroanalytisches Labor E. and E. Jägers, Bornheim, by infrared spectroscopy and energy dispersive x-ray fluorescence analysis and at the Amtliche Materialprüfungsanstalt der Freien Hansestadt Bremen by polarisation microscopy (PolMi), scanning electron microscopy (REM) and dispersive X-ray microanalysis (EDX).

¹⁸ Based on the regional present-day use of gum arabic as a fixative in sandy clay plaster, it has been speculated as to whether gum arabic might have been used already in antiquity to harden such plaster. However, the chemical analyses detected no remains of an organic binder, neither in the plaster nor in the pigments.

were not well-trained in laying out the decoration of large surfaces. Figures and texts are sometimes crammed into corners and in other parts of the walls extra text columns are added to fill open space. The figures are generally simplified including their faces and not very carefully drawn (e.g. the disproportionately large eyes of Isis and Nephthys). The figures of the mummiform deities in chamber A vary in their width and thus in the ways in which they fill their allotted spaces between the text columns. The astronomical text in chamber B was abruptly terminated when the artist ran into difficulties with the available drawing space.

The hieroglyphs are roughly drawn, often imprecise and confused, and the texts contain many mistakes and equivocations. These features, and the relatively frequent use of unusual hieroglyphs, certainly result from the artists' inability to correctly transform the hieratic signs of the archival source(s) into hieroglyphs. The obviously non-Egyptian artists were apparently trained in hieroglyphic writing, but clearly had just a limited understanding of the hieroglyphic signs and the Middle Egyptian language. This can be seen in specific syntactical features of the texts as well, for example in the erroneous and often changing use of gender markers, such as the changing of the personal suffixes for the 2nd person singular from feminine to masculine in text sections addressing the queen. Also the spelling of her names indicates that the artists were native Meroitic speakers.

that derive from possibly 90 individual vessels. Most of these sherds originate from the staircase backfill. Presumably, they were originally contained in the thieves' debris, which was backfilled into the staircase in 1923 by Reisner's men. Fragments of about 16 vessels were found scattered in the pyramid fill, the chapel and around the pyramid. In the looted and excavated burial chambers, we found only potsherds from eight individual vessels.

The fairly homogenous pottery corpus is similar to the pottery published by Dunham and even direct matches can be assumed. The assemblage ranges from utility to coarse ware sherds, including a very small number of handmade potsherds. Local fine ware is not present. The vessels were mainly produced from Nile clay and were rather low fired resulting in a typically brownish appearance. The basically Napatan vessel forms include basins (Figure 1 a-b), larger storage vessels and medium-sized grooved jars, some with 'dummy handles' similar to those published by Dunham (Figure 1 e-g; cf. Dunham 1957, 39). In addition, there are a few bowls, larger quantities of conical 'vase'-shaped dishes with flaring rims (Figure 1 c-d) and very few fragments of handmade vessels, possibly representing cooking pots, often with an additional roughened clay layer. A red wash is occasionally preserved, but the surfaces are relatively worn due to the objects' multiple moves since their deposition. A small number of wall sherds are red-slipped and burnished on

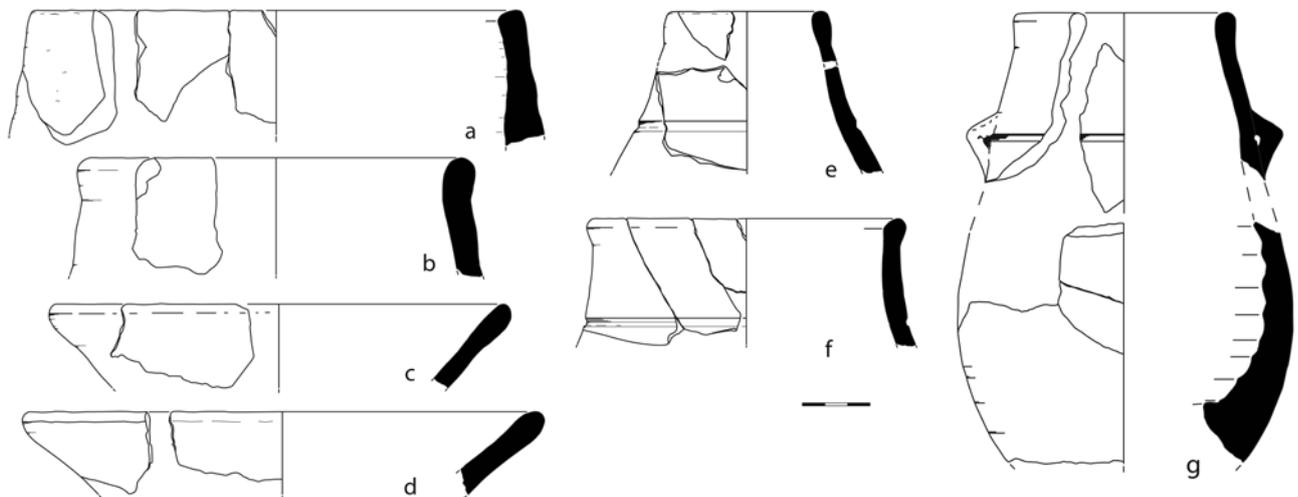


Figure 1. Pottery vessels recovered from tomb Beg. S.503: scale 1:4 (© QMPS, S. Büchner, 2018).

Pottery and Small Finds

Only a few artefacts and potsherds were left by the grave robbers and recovered by Reisner in 1922. A few objects were transported to Giza for photography and from there to the Museum of Fine Arts in Boston. According to J. W. Yellin, based on records in the *Art of the Ancient World Archives* in the Boston Museum of Fine Arts, Dunham himself inventoried and described the finds that he published in the *Royal Cemeteries of Kush* series (Dunham 1957, 37 and 39, fig. 16). Surprisingly, in addition to just a couple of small finds, our excavations in 2016-2017 recovered in total 409 potsherds

their internal and external surfaces. At least two vessels, a jug fragment and an amphora handle of clearly higher fired non-local fabrics, were identified as possible imports from Egypt. Rounded and smoothed breaks on some flat base fragments found in the pyramid fill hint at their re-use as spade sherds.

A sandstone block fragment bearing the worn remains of a hieroglyphic inscription was recovered in the staircase backfill (Plate 13). According to J. Hallof, the text fragment is part of a speech to Osiris, possibly originating from the west wall of a funerary chapel. Considering the isolated location of Beg. S.503 and the style of the block's hieroglyphs, it almost cer-



Plate 13. Sandstone block with hieroglyphic inscription found in the staircase backfill of tomb Beg. S.503 (© QMPS, P. Wolf, 2016).

tainly originates from the tomb's own funerary chapel. The small finds closely resemble the material published by Dunham. Ivory and wood fragments, small pieces of crumpled gold foil, as well as a copper-alloy rod that may have been a part of an oil lamp were recovered from the burial chambers, while fragments of a grinder, faience pieces and an ivory object, as well as two sherds of calcite 'Alabaster' vessels, similar in shape to those published by Dunham, were found in the staircase fill and around the superstructure. Reisner's excavations are also attested by a range of artefacts recovered in the tomb and in the staircase backfill. They comprise a survey nail found *in situ* in the burial chambers' entrance, a pencil (with bite marks upon the middle part), some metal pins, spent bullets probably from a Remington rifle common in the 1920s and attesting to the excavators' rather dubious spare time pleasures and, not least, the crumbly remains of an issue of *The Times* from 12th January 1923 found behind the step to burial chamber B.

Dating and History of the Tomb

Reisner assumed pyramids Beg. S.1-6, 10 and 503 represented the first royal pyramids built at Meroe and 'form the basis of the whole development of the Begarawiyah pyramids', since their type-forms 'approximate to the forms of the last pyramids built at Nuri but present certain significant differences' (1923a, 38). He included Beg. S.503 into this group because of its burial chamber decoration which he regarded as identical to that of pyramid Beg. S.10.¹⁹ He assumed it to be the last royal pyramid of this group at the

¹⁹ Which he assigned to generation 29 and dated to 265-255 BC (1923a, 66). Certain similarities in the overall plan, size, proportions and construction manner of the both pyramids led also Hinkel to assume that the both tombs were close in date and that they belonged to an early type of rubble-filled pyramids predating or contemporary with pyramid Beg. S.7 (pers. comm. J. W. Yellin, 1997).

Begrawiya South cemetery, since he presumed that its location in the *wadi* was due to the lack of space in the cemetery on the hilltop ridges (Reisner 1923b, 18). Publishing Reisner's records, Dunham shifted Beg. S.10 to generation 30 (1957, 47f) and assigned Beg. S.503 to generation 29,1. In addition, without providing any arguments in favour of this affiliation, he proposed that Queen Khennuwa was a wife of King Amanislo (generation 29; 1957, 37), the owner of pyramid Beg. S.5, who is regarded as the last ruling king buried at the South cemetery in the mid-3rd century BC. This late date was first questioned by J. W. Yellin and later by F. W. Hinkel and J. Hallof because of various architectural, epigraphic and iconographic features of the tomb (see below).²⁰

Charcoal samples and tiny wood fragments recovered during our excavations from the burial chambers, the pyramid's rubble fill and the two fire pits next to the pyramid were potentially useful for dating the tomb²¹ and reconstructing its history. The relevant samples cluster into three clearly distinguishable groups (Table 1). The first group dates the construction of the tomb to c. 790-390 cal BC.²² The charcoal

Table 1. Radiocarbon ages and calibrated date ranges of selected charcoal and wood samples from tomb Beg. S.503.

Sample Number	Material	Lab. No.	BP	calibrated 95% probability
Group 1 (period of construction)				
QSP-16-023	charcoal	Poz-88123	2490 ± 30 BP	781-511 BC
QSP-16-024	charcoal	Poz-88124	2450 ± 30 BP	754-411 BC
QSP-16-030	charcoal	Poz-88125	2440 ± 30 BP	751-408 BC
QSP-16-040	wood	Poz-88130	2500 ± 30 BP	788-537 BC
QSP-16-094	charcoal	Poz-93292	2495 ± 35 BP	790-490 BC
QSP-16-095	charcoal	Poz-93293	2385 ± 35 BP	731-393 BC
Group 2 (looting?)				
QSP-16-093	charcoal	Poz-93231	1820 ± 30 BP	AD 90-321
QSP-16-096	charcoal	Poz-93294	1875 ± 35 BP	AD 65-231
Group 3 (recent excavation)				
QSP-16-032	wood	Poz-88126	180 ± 30 BP	AD 1652-...
QSP-16-034	wood	Poz-88128	100 ± 30 BP	AD 1682-1935
QSP-16-035	wood	Poz-88129	155 ± 30 BP	AD 1666-...

samples QSP-16-23, -24 and -30 had been found in slight depressions of the floor in burial chamber A. They may originate from construction activities and/or burial rituals (fire, light, burning of incense?) and their radiocarbon dates perfectly correlate with the other samples in this group, which are more definite with regard to their context: charcoal samples QSP-16-094 and -095, both of acacia, were found 150-200mm above the Kushite ground surface in the lowest

²⁰ Török (1995, 59) dates the Queen hypothetically much earlier in the Napatan period (temp. Anlamani-Aspelta).

²¹ Parallel to the radiocarbon analyses carried out by T. Goslar and his team in the Poznan Radiocarbon Laboratory, Poland, botanical species of several samples were analysed by B. Eichhorn (Institute of Archaeological Sciences at Goethe University Frankfurt am Main, Germany).

²² Calibration according to Reimer *et al.* 2013.

layers of the pyramid's clystone fill. Sample QSP-16-040, a tiny remnant of an almost completely decayed plant of the dicotyledonous angiosperm group, was recovered from the plaster below the coffin bench. It is quite intriguing to speculate whether it originally belonged to flowers or other plants associated with the burial procedures. The two samples in the second group, QSP-16-093 and QSP-16-096, the latter being of acacia, were recovered from the two fire pits next to the pyramid. With 90-320 cal AD they date into the later Meroitic period and raise the question as to what kind of activities might have taken place during that period next to the pyramid (see below). Wood samples QSP-16-032, -034 and -035 of the third group were recovered from the first burial chamber's floor. The latter two samples represent conifers of *Picea/Larix* type, native to North America and Eurasia. Based on their dating between the mid-17th century AD and today, they very probably were part of the Harvard-Boston Expedition's equipment.

The radiocarbon ages of the first group reveal quite a wide time range from the 8th to the 4th century BC for the construction of the tomb. It covers the 25th Dynasty and Napatan period but undisputedly excludes the Meroitic period. Predating Amanislo's reign by nearly two centuries, it clearly disproves an association with this king, for which the funerary inscriptions of Beg. S.503 also do not offer any textual evidence. The pottery recovered from the tomb and the staircase backfill supports the tomb's dating in the Napatan period, and the size of the pyramid conforms to the average size of Napatan queens' pyramids. In a statistical study on Kushite pyramids, F. Hintze came to the conclusion that their sizes fall into three groups by their 'social groups' (kings and ruling queens, queens, court members). The queens' pyramids fall either into group B of larger pyramids or group C of smaller pyramids. With an average side length of 10.37m, Beg. S.503 clearly fits into group B, which is much more prominent during the Napatan than the Meroitic period.²³

According to Hallof, the burial chambers' Middle Egyptian funerary texts feature Napatan dialectal characteristics known from inscriptions of the late 5th to the early 3rd century BC (cf. Peust 1999, 72) and thus support a late Napatan date, while definitively Ptolemaic writings are not present. J. Yellin places Beg. S.503 in a decoration group with Beg. S.7, 10, 19 and possibly 8, for which she proposes a late Napatan date, since their chapel relief style is similar to that of the pyramid chapels at Nuri and different in content and style from the earliest Meroitic royal pyramids Beg. S.4, 5 and 6. Iconographic features such as the stela-like design of chamber B's west wall, the Napatan queenship iconography of Khennuwa and stylistic features such as the physiognomy of the lower torsos of Isis and Nephthys on the west wall of chamber A indicate a late Napatan date for the tomb as well. Notwithstanding Reisner's assumed similarity of the burial chamber decora-

tion of Beg. S.10 and 503, a close study of their style reveals considerable differences. According to Yellin, the decoration of Beg. S.503 is of clearly higher quality regarding its planning, execution, and use of mortuary texts. For example, on the west wall of chamber A, a carefully painted pylon gate with a winged disc frames the doorway that is flanked by full-height representations of Isis and Nephthys (cf. Plate 9). The same wall in Beg. S.10 displays only a rather clumsy painted winged disc above the doorway, while the same goddesses represented on it are small, poorly positioned and executed (Dunham 1957, pl. XV A). Moreover, a carelessly painted band of hieroglyphs runs from the chamber's sidewalls into the representations on the west wall. Compared to Beg. S.503, its sparser funerary texts are different and the execution of their hieroglyphs is inferior (Dunham 1957, pl. XV B-D). These observations suggest that Beg. S.10 was modelled on Beg. S.503 and, therefore, postdates the latter – not *vice versa* as was assumed by Reisner.

On the basis of the radiocarbon dates and these epigraphic and iconographic arguments, we may assume a late 5th/early 4th century BC date for the construction of the tomb. Accordingly, its assignment to generation 29 by Dunham cannot hold. It would have to be moved to generations 20-22, i.e. to the reigns of Kings Talakhamani (gen. 20), Irike-Amanote (gen. 21) and Baskakeren (gen. 22). This proposed shift is clearly supported by some of the tomb's architectural features, which have not yet been taken into consideration: The majority of the Meroitic pyramids at Begrawiya are more or less dislocated from their substructures and the orientations of their staircases, burial chambers and superstructures deviate to varying degrees. These dislocations and deviations may be due to topographic obstacles such as the location of earlier tombs, varying inclinations and other irregularities of the ground's surface, as well as inconsistencies in the bedrock at the respective construction sites. In any case, it appears that an alignment of super- and substructures was not regarded as crucial during the Meroitic period. This is true for the group of pyramids Beg. S.1-2, 4-6 and 9-10, which Reisner and Dunham regarded as the earliest at Meroe – but not for Beg. S.503, whose superstructure's centre meets the burial chambers' axis at its intersection with the niche in chamber B's rear wall. At Nuri, however, the Napatan tombs and particularly the queens' pyramids show a more or less exact alignment of super- and substructures as a regular feature. Moreover, several queens' pyramids, amongst them those of generations 19-23,²⁴ have the above-mentioned meeting point at or next to their niche in burial chamber B. Whether this alignment can be regarded as a chronological feature needs further study, but other architectural features of Beg. S.503 such as the presence of a plinth course for the pyramid, the (unfinished) cornice at the rock-cut entrance to the tomb, the barrel vaulted burial chamber roofs, the masonry coffin bench rather than a rock-cut one, and a niche in a medium to

²³ See Hintze 1981, 92-94 and tables 1, A5-A7 on pp. 96f; based on Reisner's and Dunham's chronology, Hintze grouped Beg. S.10 and 503 into group B of his third (Meroitic) period.

²⁴ For the queens' pyramids of generations 19-23 see Dunham 1955, 199-205, 216f, 225-235 (pyramids Nu. 31-34, 44 and 61).



high position on the rear wall of the second burial chamber conform more closely to the apparently standardised queens' pyramids of generations 19-21 at Nuri than to the group of early Meroitic pyramids of generations 28-30 at Begrawiya South. The tomb most similar to Beg. S.503 with regard to these features is Nu. 33. Dunham assigned it to generation 21 (1955, 216f: temp. Irike-Amanote) which is generally dated to the turn of the 5th to the 4th century BC.

The new dating of Beg. S.503 around the turn of the 5th to the 4th century BC possibly makes it the first Napatan royal pyramid tomb at Begrawiya South.²⁵ As already suggested by Yellin (2015, 603f), Reisner's assumption that the unusual location of Beg. S.503 in the *wadi* was due to lack of space in the Begrawiya South cemetery does not hold. Rather the construction of Beg. S.503 and Beg. S.10 at their locations was due to choice. Hinkel assumed that both tombs were probably situated by pathways leading into the low-lying north-eastern part of the family cemetery of Begrawiya South.²⁶ Given these special locations, it appears that their tomb owners, Queens Khennuwa and Karatari, may have played special roles in their families' history. Furthermore, Yellin has noted that a cluster of late Napatan tombs on the north-western edge of the South Cemetery's hilltop²⁷ was apparently oriented towards the tomb of the Hereditary Princess and King's Wife Khennuwa, which supports this assumption and offers additional evidence for the early dating of her tomb. A parallel to the astronomical text in her tomb is part of the funerary decoration of tomb P-26 discovered in 1995 near Jebel Barkal (Berenguer 1999; 2004). The use of such texts in the Theban tombs of Montemhat, Harwa and other officials suggests that the traditional Pharaonic sources for the decoration of such tombs were brought to Napata during the 25th Dynasty. The presence of these texts at Napata and Meroe testifies to the residence of closely related elite groups in both regions (Yellin 1984, 580).

While we did not find any evidence associated with the centuries following the tomb's construction and the Queen's burial, there are some arguments in favour of the assumption that the two fire pits recovered to the south east of the pyramid may attest to the looting of the grave already in the later Meroitic time: The robber trench was situated, as most of the robber pits in the Meroe cemeteries, at the western end of the stairway, indicating that the robbers must have known about the staircase (cf. Dunham 1957, 2). Unlike at Nuri, Reisner did not find medieval potsherds in the thieves' debris and the fruitless attempts of European treasure hunters like G. Ferlini and early archaeologists like Budge to gain access to burial chambers by dismantling pyramids proves their ignorance about the stairways' existence or location. Therefore,

²⁵ Rubble filled pyramids like Beg. S.503 appear at Nuri on a more regular basis from generation 20 onwards (Nu. 16, Talakhmani). Therefore, Beg. S.503 at the least may have represented the first pyramid of that kind at Meroe.

²⁶ Pers. comm. J. Yellin.

²⁷ E.g. Beg. S.102-104 and 132 (see Dunham 1963, 424 and 362f).

the extensive looting of the royal tombs at Meroe must have already taken place in the Meroitic and Post-Meroitic periods, when the stairs were still known. The looting of Meroitic cemeteries in the Post-Meroitic period has often been assumed. With 90-320 cal AD, our fire pits date, however, to the late classic/late Meroitic periods. During this time, when the economic power of the Meroitic royal house diminished, temples and 'palaces' fell into ruin at many Meroitic sites.²⁸ After dynastic changes, the looting of older clan cemeteries may even have been organised by the royal house to replenish empty treasure chambers – probably without being regarded as sacrilegious.²⁹ The most recent attempt to dig down to the tomb's burial chambers is attested by the large shallow pit in the middle of the pyramid fill. If it was not a kaolin quarry, the pit may have been dug by grave robbers ignorant of the tomb's staircase and they apparently gave up before they reached the subsoil.

The tomb was completely excavated by Reisner's team 12th to 16th January 1922 and was apparently left open until 1923. The find of *The Times* of Friday, 12th January, 1923 reveals a *terminus post quem* for the re-blocking of the tomb, which was not recorded in the excavation diary. Reisner joined the 1923 season on 10th February and may have brought the newspaper from Egypt. After the re-blocking, the grave chambers of Beg. S.503 remained untouched for almost a century until they were re-opened and re-documented by QMPS in 2016. This re-documentation yielded not only a detailed record of hitherto unknown features of the burial chambers' decoration and inscriptions – and thus new information on the intellectual background of the Kushite funerary practices, iconographic rules as well as the decoration techniques used by the craftsmen – but also clear dating evidence and data instrumental for reconstructing the tomb's planning and construction process. It is, therefore, not an overstatement, if we characterise Beg. S.503 today as the most comprehensively recorded and one of the most fascinating tombs in the royal cemeteries of Meroe.

A Conservation Strategy for the Pyramids of Meroe

The pyramids at Meroe and their well-preserved relief decoration are adversely affected by various climatic and man-made threats. Before the mid-20th century, the most severe damage resulted from natural deterioration, structural problems, willful destruction for building materials and by treasure hunting (Hinkel 2000). In addition, Reisner's large-scale excavations massively changed the situation at the site by freeing many

²⁸ For example at Meroe (Hinkel and Sievertsen 2002, 30f), Hamadab (Wolf *et al.* 2014, 104 and 110), Naqa (Wildung 2011, 51) and Wad ban Naqa (Vrtal 2013, 62), as well as in Meroitic Upper Nubia (Lohwasser 2013, 280-282).

²⁹ The fate of Beg. N.53, which is generally assumed to be the tomb of King Arnekhamani, the superstructure of which was apparently torn down to make room for Queen Amanishakheto's pyramid Beg. N.6, may also attest to such practices.

funerary chapels and the lower parts of the pyramids from debris, as well as by dismantling several chapels and destroying some pyramid corners (Hinkel 1992, 156). Since the 1960s, specific threats such as the desertification of the Meroe region and the constantly rising number of visitors to its sites have increased tremendously: nowadays, destruction by sand abrasion and damage by visitors are the most severe factors adversely affecting the site.

First attempts to preserve and protect the unique corpus of Kushite funerary architecture and iconography at Meroe were undertaken in the first half of the 20th century by the Sudan Antiquities Service (SAS), when its director, A. J. Arkell, initiated repairs of several endangered pyramid components in 1947 (Hinkel 1992, 156). From 1976 until 2004 protection was continued by the SAS and NCAM: an extensive campaign to preserve and document the pyramid cemeteries started under the direction of F. W. Hinkel. He and his NCAM technical team reconstructed and secured chapels and their reliefs as well as the pyramids of 27 tombs in the North and South Cemeteries. QMPS revived these conservation and preservation efforts in 2015 (Riedel *et al.* 2016). The conservation company *Restaurierung am Oberbaum* (RaO), under the direction of Jan Hamann, identified all damage in the royal cemeteries of Meroe and assembled a catalogue of it using common international conservation classification and terminology. In addition, a detailed mapping of the damage at tombs Beg. N.2 and 9 was prepared in order to estimate the extent of conservation necessary.

As a second step, it was crucial to define the conservation goal. According to the first ‘general policy goal for the development of Meroe’,³⁰ the main aim of all measures at Meroe is to protect and to save the monuments and their setting for future generations and to plan and realize measures with respect to the *Outstanding Universal Value* (OUV) of its sites, their integrity and authenticity. The OUV of the Meroe pyramid cemeteries was outlined in the inscription of the serial property ‘Island of Meroe’ into the World Heritage List. It can be summarized as follows: The pyramids are outstanding examples and the best preserved relics of Kushite funerary monuments. They are located in a semi-desert area east of the capital city Meroe and illustrate the association with the urban center. The integrity of the site has only been reduced by the treasure hunting of Ferlini, the construction of the Khartoum-Atbara highway and the high voltage power transmission line along its route. Large-scale reconstruction, including the introduction of new materials, and anastylosis have had a comparatively small effect on the authenticity of the pyramid cemeteries, but conservation approaches based on best practice should be developed avoiding those less fortunate techniques and methods (<https://whc.unesco.org/en/list/1336>). Comparing F. Cailliaud’s lithograph of the Begrawiya North pyramids in 1821 with the present situation shows that the general setting of the site has not

changed dramatically during the last two centuries (Plates 14 and 15). The character of the site – the ruins surrounded by an untouched savannah landscape – still exists and it must be the basic strategy for every future conservation and site management measure to preserve it.



Plate 14. *Begrawiya North in 1821* (Cailliaud 1823, pl. xxxvi).



Plate 15. *Begrawiya North in 2016* (© RaO, 2016).

In a third step, preliminary conservation was initiated for tomb Beg. N.2 which was chosen as a prototype. The pyramid and its heavily damaged funerary chapel had not experienced major previous preservation work. The pyramid showed typical damage such as partially collapsed, heavily eroded cladding blocks and a loose pyramid filling. The chapel with its unique and well-preserved outer and inner reliefs was endangered by major structural problems and sand abrasion. Between 2016 and 2018, RaO applied several conservation materials and methods to assess their suitability and durability. Various procedures to conserve and to strengthen the pyramid’s masonry cladding were tested by treating heavily eroded stone blocks with different chemicals and conservation mortars. An artificial stone block was inserted for structural stabilisation and an artificial ‘desert varnish’ was tested to replace the abraded patina of the sandstone (Plate 16). While large-scale reconstruction affecting the authenticity of the site should be avoided, the tested conservation techniques will be applied to the sandstone masonry preserving its natural variety.

To prevent further loss of the pyramid’s masonry and

³⁰ Common strategic objectives for the development of Meroe were defined by all stakeholders of this World Heritage Site in 2014 (see below).

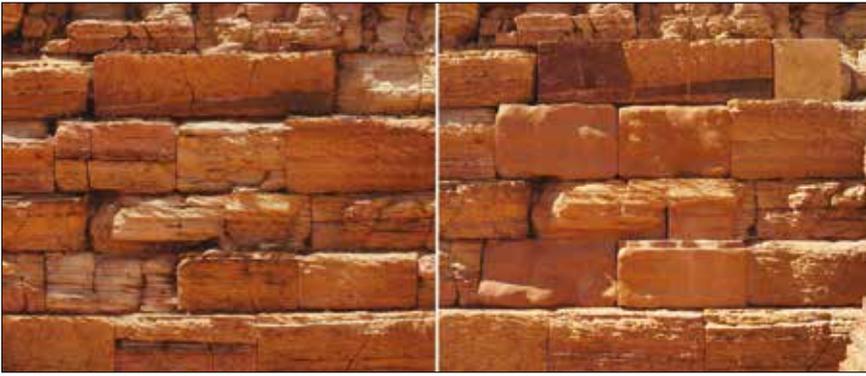


Plate 16. Sample axis at pyramid Beg. N.2 before and after the conservation tests (© RaO, 2016).

rubble fill, its uppermost cladding blocks were stabilised by metal cramps to establish a static ring. A high-tensile steel net was installed on top of the rubble fill and fixed to the ring of cladding blocks (Plate 17). Both cramps and net are



Plate 17. Stabilisation at top of pyramid Beg. N.2 (© RaO, 2016).

virtually invisible from the ground. After strengthening the funerary chapel's masonry and securing its original remains, it was carefully dismantled in the winter of 2018 with the help of a portable frame crane, specially constructed for the work at the pyramid chapels. All chapel blocks were registered, documented and transported to the magazine of the nearby QSAP camp to undergo consolidation and conservation under controlled laboratory conditions.

Last but not least, a strategy was discussed, as to how to deal with previous conservation and reconstruction work. Hinkel's anastylosis and reconstruction have proven to effectively preserve archaeological remains by protecting numerous reliefs from destruction and sand abrasion. However, 15 years of insufficient maintenance after Hinkel's death necessitate new conservation and repair efforts, for example of chapel roofs, decayed brickwork and plaster. Furthermore, he and his team unfortunately did not have enough time to complete

all of the protection work they had started. As a result of an assessment, measures were necessary given the present state of Hinkel's reconstruction work. Therefore, QMPS continued his efforts by completing the chapel reconstruction at pyramids Beg. S.6 and 10.³¹ In accordance with his methods, his reconstructed brickwork was repaired and plastered along with the addition of some new brickwork to finish the reconstruction that was started 15 years ago (Plate 18 and 19). Together with this work, the reliefs of four chapels that originally were covered by Hin-



Plate 18. Reconstruction work at the chapel of pyramid Beg. S.10 (© QMPS, T. Bunk, 2017).



Plate 19. Plastered chapel pylon of pyramid Beg. S.6 (© QMPS, A. Riedel, 2017).

³¹ Carried out by NCAM's construction division under the supervision of T. Bunk.

kel with mud mortar for their protection during construction were cleaned. Finally the conservation work at the chapel reliefs of pyramids Beg. S.6 and 10 was begun by cleaning, conserving and replenishing them with artificial stone mortar to re-establish the original wall structures.³² Joints were kept open or filled with a recessed soft mortar. In that way, the flexible structure of the masonry was strengthened, their general appearance improved and the future loss of original surface due to animals and vandalism will hopefully be reduced.

Site Management and Tourism Development at Meroe

QMPS actively engages in the development of the working site management and sustainable tourism for Meroe and for the World Heritage Sites of the 'Island of Meroe' and considers these activities to be some of the project's key tasks. The starting point for these activities was a workshop focusing on sustainable tourism at Meroe and the 'Island of Meroe', jointly organised by QSAP and QMPS in the Rotana Hotel in Khartoum in January 2014, at which representatives of all stakeholders discussed the future development of the sites and the Meroe region. A broad range of diverse issues related to tourism were addressed. Visions, concerns and intended measures were presented, in particular the management of the tourist flow, necessary infrastructure such as signage, information panels and pamphlets, the installation of a museum and a visitor centre, the training of tour guides and, not least, the involvement of and the benefits for local communities. The stakeholders agreed on common strategic objectives such as general policy goals for the development of Meroe and management objectives to initiate sustainable tourism at Meroe (2014 to 2018).

Since 2014, QMPS in close cooperation with CSRM (Cultural Site Research and Management, directed by D. Comer) analysed visitor demographics at Meroe, assessed the current visitor situation and developed a sustainable tourism plan.³³ On the basis of this evaluation, CSRM defined several management zones related to the major sites of the 'Island of Meroe': Meroe City and the pyramids of Meroe, Musawwarat es-Sufra and Naqa. Interpretive themes were assigned to these zones together with proposed visitor itineraries; necessary visitor facilities and their locations were suggested – while always considering the sensitivity of the local resources. In addition, CSRM identified the needs for the development of a sustainable tourism, for which information and tourist facilities are the most crucial conditions for a safe, instructive and enjoyable visit to the region's archaeological sites. Two kinds of information – general and thematic – must be provided in four consecutive phases. General information provides a basic orientation for visitors to allow them to

focus on the sites and offer thematic information. In a first 'Outreach and Pre-arrival Phase' tourists will plan their visits, usually with the help of the internet or tour operators. They will learn how to obtain a visa and tickets, how to travel to the individual sites, which services will be offered (guided tours, camel rides, shopping and accommodation facilities) and last, but not least, what is to be expected at the sites. A local visitor centre is essential to provide this general and first thematic information. A subsequent 'Orientation and Access Phase' will comprise information about site-exploration and didactic facilities, paths and wayside exhibits, how to access complementary services such as restrooms and souvenirs, but also visitor safety recommendations and site preservation rules. A third 'On-site Exploration Phase' will require local orientation at the sites and thematic information through panels located at specific places. Finally a fourth phase, an 'Off-site Programming and Links Phase', primarily provided through the internet, will focus on additional information such as special events or developments at the sites that may stimulate interest in taking another trip. These considerations are, of course, just a first step towards a general site management plan. The needs and opportunities that have been identified will have to be steadily updated and adapted in light of new developments.

QMPS has immediately started implementing these ideas and plans. The site entrance to the pyramid cemeteries of Begrawiya North and South was rehabilitated, enhanced with new facilities and inaugurated on the 26th January 2017 with the exhibition 'The Pyramids of Meroe' including interpretive panels to welcome and inform tourists about the ancient necropolises (Plate 20). In the same year, the *Begrawiya-Visitor-Centre* was implemented in the 'Nubian Houses' south of the Meroe site buffer zone to provide basic site-infrastructure



Plate 20. Public opening of the exhibition 'The Pyramids of Meroe' in the site entrance to the cemeteries of Begrawiya North and South (© QMPS, U. Nowotnik, 2017).

orientation for visitors and local staff (Plate 21). It comprises a site management office to enable the permanent presence of a site manager and team, which creates an important base for local site monitoring and maintenance.³⁴ Besides site and

³² Executed by A. Schulz (Co. Rütt & Schulz, Berlin).

³³ It is considered a first part of a general site management plan. Further parts, such as plans for staffing, equipment and funding for each management zone, will be added successively.

³⁴ Regular site monitoring and maintenance at the pyramids of Meroe



Plate 21. *The new Begrawiya-Visitor-Centre*
(© QMPS, Mohamed Tohami, 2018).

visitor monitoring, the office organises educational events such as lectures in local schools and villages, guides school groups as well as conducting training workshops for tour guides. In winter 2017/18, an exhibition of Sudanese artists was shown in the visitor centre and several public events were organised. An exhibition providing information on Sudanese history and in particular about the 'Island of Meroe' World Heritage Sites is presently under development. In 2018, the construction of a new site entrance to the royal necropolises of Meroe located to the south of the pyramid fields started. In addition, the Tarabil Museum, the construction of which was begun by Hinkel in the *wadi* between the royal cemeteries of Begrawiya North and South, will soon be completed. It will focus on the history and archaeology of Meroe.

Sustainable tourism should provide more than just tourist facilities and an enjoyable experience for visitors. It should develop the archaeological sites in a way that preserves the natural and cultural resources of the region. It should, moreover, catalyse social and economic benefits for the local communities and the country of Sudan and protect the sites' OUV. Good relations with, and mutual benefits for, local communities are crucial for the development and protection of the archaeological sites. To achieve this, various interest groups have to be considered. Apart from foreign tourists and visitors from large Sudanese communities like Khartoum, all of whom are expected to contribute economically to a certain extent, students and local communities will gain cultural education and a sense of national identity. Taking into account the significance of these interest groups, QMPS is very much engaged in community information and outreach. On 1st January 2018, New Year and Sudan's Independence Day,³⁵ the project contributed to the local celebrations at Meroe City and the royal pyramids by arranging a show for children, performances of traditional musicians and other

was initiated in 2016 by Mahmoud Suliman Bashir, Resident-Manager of the Island of Meroe World Heritage Site and Regional Director of Antiquities – River Nile State, NCAM.

³⁵ During the last decade people of the Meroe area have increasingly enjoyed celebrating the New Year and Independence Day at the archaeological sites – Meroe City and the royal pyramids. In 2016-2018 between 2,000 and 3,000 visitors were estimated to have visited the pyramids on that day.

activities with a focus on heritage, identity and pride in their own past, as well as on the importance of protecting historic monuments and traditions. The feedback was overwhelmingly positive. Other forms of community information and engagement were introduced in winter 2017/2018 through the newly established visitor centre and a new open-air stage for hosting public cultural and educational events. For example, a well-known folk music and traditional dance ensemble gave a concert at the centre – an event that was repeated due to its success (Plate 22). In addition, a media office was estab-

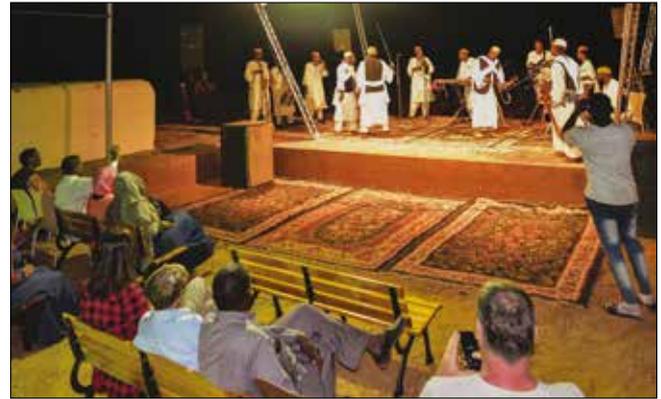


Plate 22. *Open-air concert at the Begrawiya Visitor Centre*
(© QMPS, Mohamed Tohami, 2018).

lished. It installed the YouTube channel 'Meroe Centre' and a Facebook page to present a monthly newsletter and short clips promoting the project's field work and its social activities (Plate 23). These outreach undertakings enjoy much popularity, since social media has become a very attractive means of social networking in Sudan, particularly amongst the young.

The Visit of Her Highness Sheikha Moza bint Nasser to Meroe and its Impact on the Reception of Sudan's Archaeological Heritage

On Sunday 12th March 2017, Her Highness Sheikha Moza bint Nasser Al Missned, mother of the current Emir of Qatar, visited the pyramids of Meroe during her official visit to Sudan. While visiting the plateau of the North Cemetery, the exhibition in the enhanced site entrance and the visitor centre, Her Highness familiarised herself with the World Heritage Sites of the 'Island of Meroe', the achievements of the QSAP and, in particular, with the work of the QMPS. Her visit and the subsequent international propaganda promoted the pyramids of Sudan to an unexpectedly large extent. It created an incredible amount of media coverage in Sudan and in the Arab world. At the same time, an extensive discussion in Arabic social media started attempting to provoke a negative image of Sudan's royal pyramids by minimizing their cultural significance and even their size. However, this discussion promoted Sudan's archaeological heritage in an unexpected way and the reaction of the Sudanese population and its government was remarkably positive. The Minister

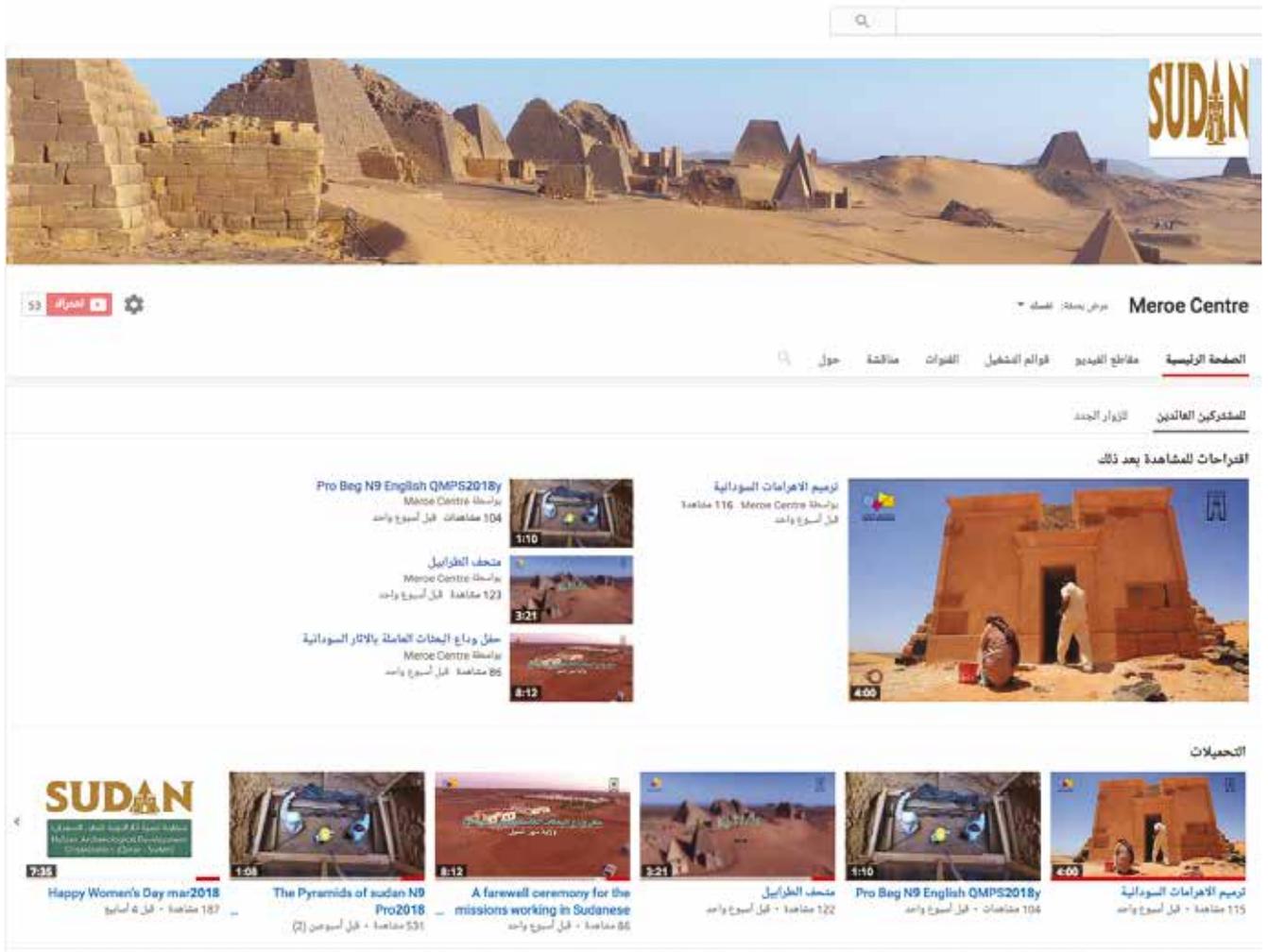


Plate 23. YouTube channel 'Meroe Centre' (screen shot from <https://www.youtube.com/channel/UCQocXAi2F4SUXHLJOLfsYyg/featured>; last seen 12.8.2018).

of Tourism, Antiquities and Wildlife launched a large media campaign promoting Sudan's archaeological heritage. More than 30 journalists and almost all local TV channels embarked on a tour to the World Heritage Sites around Meroe and Jebel Barkal. The Sudanese population started discussing the value of the pyramids and Sudan's heritage in social media and in everyday life. As a result, the interest in Sudan's archaeological heritage increased tremendously. This was clearly visible, for instance, in the suddenly increased number of Sudanese visitors to the pyramids at Meroe and in a massive presence of the Meroe pyramids on advertisement boards along the large avenues in Khartoum. The pyramids were repeatedly promoted on national TV channels and famous Sudanese bands included the pyramids in their music videos. As a result, Sudan's pyramids became more and more a symbol of Sudanese national identity.

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