Sudan & Nubia

The Sudan Archaeological Research Society

Bulletin No. 18 *2014*


LIBYA
EGYPT
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Front cover: Examining the pharaonic inscriptions at Khashm el-Bab on the Korosko Road, November 2013 (photo: D. A. Welsby).

Sudan & Nubia is a peer-reviewed journal

The graffiti of Musawwarat es-Sufra: current research on historic inscriptions, images and markings at the Great Enclosure

Cornelia Kleinitz

Introduction: Musawwarat and its graffiti

Monumental buildings of the Meroitic period (*c.* 270 BC-AD 350) in the Kingdom of Kush, such as the pyramids of Meroe or the temples of Naqa, impress due to their architectural intricacies as well as their decorative programmes including wall and column reliefs together with other architectural decoration. In contrast, the Great Enclosure of Musawwarat es-Sufra, a unique sacral architectural structure with numerous temples and other rooms, corridors, ramps and courtyards, lacks evidence for a rich primary decorative programme (Wolf 1999b; Wenig 2001). Rather, the seemingly bare sandstone walls of this labyrinthine building complex were incised over time with thousands of images and hundreds of inscriptions, forming one of the largest preserved corpora of historic graffiti in the Nile Valley (Hintze 1979; Wolf 1993-1994; Kleinitz 2008a; 2013). As many of these graffiti date to the Meroitic period, i.e. the time the Great Enclosure was in use, they have been used (and abused) by numerous researchers to support their respective interpretation of the function(s) of this enigmatic monument. Interpretations see the Great Enclosure as a pilgrimage centre, hunting palace, trading or elephant-training station (see Wenig 2001), and more recently as the main sanctuary of the lion god Apedemak (Wolf 2001).

Since some of these interpretations are based on a cursory and highly selective study of the Musawwarat graffiti, it is worth highlighting the immense richness and variability in motifs dating to the Meroitic period. The graffiti of the Great Enclosure include more than 100 inscriptions in Meroitic cursive script, among them numerous invocations addressed to Apedemak (most recently Wolf 1999b; 2001). Zoomorphic motifs are prominent among the graffiti, such as lions, elephants, giraffes, baboons, cattle, horses and dogs, to mention but a few. Many of these pictorial graffiti show similarities in form characteristics and/or image content with Meroitic period iconography known from other, well-dated contexts (Hintze 1979). Some animals are equipped with attributes that identify them as belonging to the religious sphere of the Meroitic state, such as a winged lion with a *hemhem* crown as a personification of Apedemak (Plate 1) or a ram with a double-plumed crown as a personification of the god Amun (Hintze 1979; Wolf 1999b; Kleinitz 2008a; 2013).

Anthropomorphs, most of them male figures (Plate 2), have been interpreted as representing enemies of the

Plate 1. Lion god Apedemak with hemhem *crown, wall 520/516.*

Meroitic realm, members of the (royal) elite and of special occupational groups, including priests, on the basis of various attributes, including headgear, coiffure, facial hair and markings, jewellery, clothing, gesture and apparent activity (Hintze 1979; Wolf 1993-1994). Depictions of gods and mythical hybrid beings (see Plate 1), such as sphinxes, or cult-related objects, for example horned altars and barques, and of 'symbols', such as the winged sundisk, relate many of the graffiti to the (magico-)religious sphere of the Meroitic state (see also Hintze 1979; Wolf 1993-1994; 1999b). Some of the motifs of the Meroitic period exhibit a great variation in manner of depiction, which may range from life-like to 'geometric'. Giraffes are one of the motifs that are rendered with very different amounts and types of visual information (see below). The variability in the motif spectrum and in form conventions raises questions regarding the authors of the graffiti and graffiti-making contexts, and not least as to the function(s) of the Great Enclosure (see Wenig 2001 for a summary of numerous hypotheses on the purpose of the building complex).

After the Great Enclosure lost its primary function(s), at the latest with the collapse of the Meroitic state, the monument was still utilised and graffiti were added. Most prominent among these are the graffiti of the Christian medieval period (*c.* AD 500-1500), which include depictions of crosses

Plate 2. Bearded male head graffito and mason's mark, wall 529/515.

and camels as well as name graffiti and monograms using Greek script and, among others, referring to the archangel Michael (Hintze 1979). Camels, together with a multitude of geometric motifs, are also characteristic of the following post-medieval Islamic period. The most recent graffiti date to the past 200 years, a time during which the Nile Valley has been explored scientifically and touristically (see below and Kleinitz 2008a; 2013).

The Musawwarat Graffiti Project: aims and definitions

Since 2007 the Musawwarat Graffiti Project (MGP) – developed and directed by the author – has been dedicated to the detailed documentation, study and publication of the graffiti corpus of the Great Enclosure.[1] The term 'graffito' is employed within the project to describe an intentional, secondary (or tertiary etc.) modification of a built surface for purposes that do not appear to be directly linked to building processes. This definition excludes traces from the primary building process and decorative programme, such as reliefs or sculpture as well as chisel traces from quarrying and shaping the sandstone blocks. It also excludes traces of building modification, such as the re-shaping and polishing of sandstone blocks and their surfaces for secondary use, an issue that is especially relevant for the Great Enclosure at Musawwarat with its multiple building phases involving the re-use of building blocks over time (Hintze and Hintze 1970; Wenig 2001; Priese 2003). Mason's marks are likewise linked to the building and re-building process. They are easily recognisable by their restriction to individual block surfaces and by their adherence to a specific canon of motifs with very consistent form and line characteristics, the latter quite probably due to the use of a standardised type of tool (see Karberg 2001).[2] In a few cases mason's marks have been modified at a later stage, allowing the resulting 'entity' to be included in the category 'graffito'.

The definition of 'graffito' employed in the project also posits a distinction to 'rock art', intentional subtractive or additive modifications of natural rock surfaces in the landscape (in contrast to Wolf 1993-1994). Even though – at least in the case of the Middle Nile Valley – graffiti and rock art motif corpora appear to overlap significantly (Hintze 1979; Wolf 1993-1994; Kleinitz 2007; 2008a; 2008b), a differentiation is made between the two corpora on the basis of their location contexts: architectural or 'monumental' structures versus natural rock outcrops, slabs, boulders or rock overhangs. This location-dependent distinction takes note of possible differences in contexts and motivations of marking architecturally framed spaces and 'natural' places. Upon closer inspection and despite overlaps, different graphic reservoirs appear to be represented in graffiti and rock art corpora, with most rock art corpora lacking a clear reference to the motif canon and form characteristics of Meroitic 'official', i.e. state-related art (but see Welsby and Welsby-Sjöström 2006).

A category of motifs that is a standard part of rock art studies but that is not usually included in studies of graffiti corpora are so-called 'markings', which include cup marks, grooves and other hollows. At Musawwarat – as in the built surfaces of many other monuments of the ancient world (such as the pyramids of nearby Meroe) – markings are frequent (Plate 3). Indeed, beside inscriptional and pictorial graffiti, markings form a third main component of the Musawwarat graffiti corpus. While markings defy the more traditional definition of a graffito as an inscription and/or an image, they nevertheless provide information on the wide range of activities at the Great Enclosure that left their mark on the built walls.

Plate 3. Abraded hollow superimposed over Meroitic cursive inscription, wall 115/106.

In contrast to primary architectural decoration, graffiti corpora potentially allow the study of multiple perspectives

[1] The MGP has been supported by the Packard Humanities Institute (2008-2009), Humboldt-Universität zu Berlin (2008-2012, 2014), the Max Planck Institute for the History of Science (2008-2014), the Culture Preservation Fund of the German Foreign Office (2009 and 2011), the Golden Web Foundation (2011), the Berlin Excellence Cluster TOPOI (2011), the British Institute in Eastern Africa (2012), the Rock Art Research Institute of the University of the Witwatersrand (2013) and since autumn 2013 the Nubian Archaeological Development Organization (Qatar-Sudan Archaeological Project). Besides Cornelia Kleinitz (project director) and Jens Weschenfelder (deputy project director), project members over the years include(d) Zaroog Bakri (NCAM inspector and RTI recording), Thomas Bauer (head of 3D-scanning), Juliette Brauer and Julius Bussilliat (student assistants – field/office), Robert Casties (web database and workbench design), Tobias Eick (student assistant – office), Mohamed el-Tayeb (logistics and RTI/field recording), Victoria Grünberg (student assistant – field/office), Hassan Ibiedallah (logistics and RTI recording), Franziska Lehmann (student assistant – field/office), Elisabeth Lindinger (project database design and development), Ralf Miltenberger (student assistant – office), Hembo Pagi (head of RTI recording), Julia Preisigke (student assistant – field/office), Sandra Rackel (3D-scanning), Agata Sander (field recording and data preparation/entry), Stefan Schreiber (student assistant – office), Dina Serova (student assistant – field/office), Amy Stafford (identity and web design), Tanja Zech (student assistant – office). Fieldwork is undertaken as part of the Archaeological Mission to Musawwarat es-Sufra, led by Claudia Näser.

[2] A doctoral thesis by Tim Karberg is in progress on the mason's marks of Musawwarat es-Sufra.

on built spaces from synchronic and diachronic perspectives. It is one of the aims of the project to not only gain an overview of the graffiti corpus of the Great Enclosure, but also to investigate in what way the Musawwarat graffiti can contribute to our knowledge of the site, its functions and its reception during the Meroitic and later periods. In what way did they document or reflect actual events or functions of specific sections of the Great Enclosure? Did the graffiti perhaps relate to 'reality' rather obliquely in having been drawn from various symbolic reservoirs and placed in an architectural space on different occasions and with different motivations? Indeed, who were the authors of the graffiti? For what purpose(s) and during what occasions were graffiti made? What can we learn from the Musawwarat graffiti about the Middle Nile Valley beyond the Great Enclosure and its immediate surroundings, concerning fields such as religious beliefs and practices, art and literacy (Hintze 1979)? In order to be able to address these and other questions, a critical discussion of the very notion of 'graffito' in respect to the Musawwarat corpus is central to the project, including an investigation of the assumed opposition between 'primary' and 'secondary' decoration, 'official' and 'unofficial' as well as 'formal' and 'informal' art and inscription, and 'authorised' and 'unauthorised' contexts of image making and writing.

Graffiti documentation: disentangling the lines

Before the launch of the Musawwarat Graffiti Project, the graffiti of Musawwarat had been the subject of two previous documentation projects, the first led by Ursula Hintze and the second led by Pawel Wolf. Ursula Hintze photographically recorded *c.* 700 graffiti from across the Great Enclosure in the 1960s. She numbered and described each of the graffiti entities in a card catalogue and began to classify and describe the graffiti corpus she had recorded. Sadly, Ursula Hintze published only one paper on the subject (Hintze 1979). In the 1990s Pawel Wolf took over the study of the Musawwarat graffiti. Wolf recognised the strong selectivity of Hintze's graffiti record and aimed to create a more comprehensive photographic documentation. Wolf photographed about 2500 graffiti and prepared aluminium foil impressions of many of these (Wolf 1999a). The collection of descriptive data on pictorial graffiti was not part of his documentation strategy. Due to other commitments Wolf discontinued the project after the publication of a number of graffiti-related papers (Wolf 1993-1994; 1999a; 1999b; 2001).

The Musawwarat Graffiti Project, therefore, represents the third attempt to record, study and publish the graffiti corpus of the Great Enclosure.[3] Recognising limitations in both previous sets of documentation, a new recording strategy was developed, implemented and refined since the first field season in 2008 (Kleinitz 2008a). The recording strategy aims at the detailed graphic and descriptive documentation of the graffiti in their exact location, taking into account that their placement may contain important information on the significance of the graffiti, and on contexts and motivations of graffiti making. Many of the graffiti were placed on the sandstone blocks in a manner which suggests that their makers respected the block edges (see Plates 1 and 3). This indicates that the blocks themselves were visible and not obscured by plaster when the graffiti were made (for a discussion see below). As the individual block often appears to have served as a 'canvas', the project's documentation strategy takes the individual block (surface) as a point of departure, instead of studying individual graffiti in isolation from their sandstone block support (Kleinitz 2008a).

Photographic recording operates at several levels. It includes overview photos of the wall and of sections of the wall, block-based photography, and photos of individual graffiti and graffiti groups – especially if the latter involve more than one block. Ideally, photography is repeated under different lighting conditions as the visibility of the block surfaces and their graffiti changes rapidly when they are lit directly or indirectly, or when light is coming from different angles and directions (Plate 4). Strong side-light is often used in graffiti and rock-art photography as it creates shadows within the (incised) lines that allow for impressive photos (see Wolf 1999a). However, while side or raking light brings

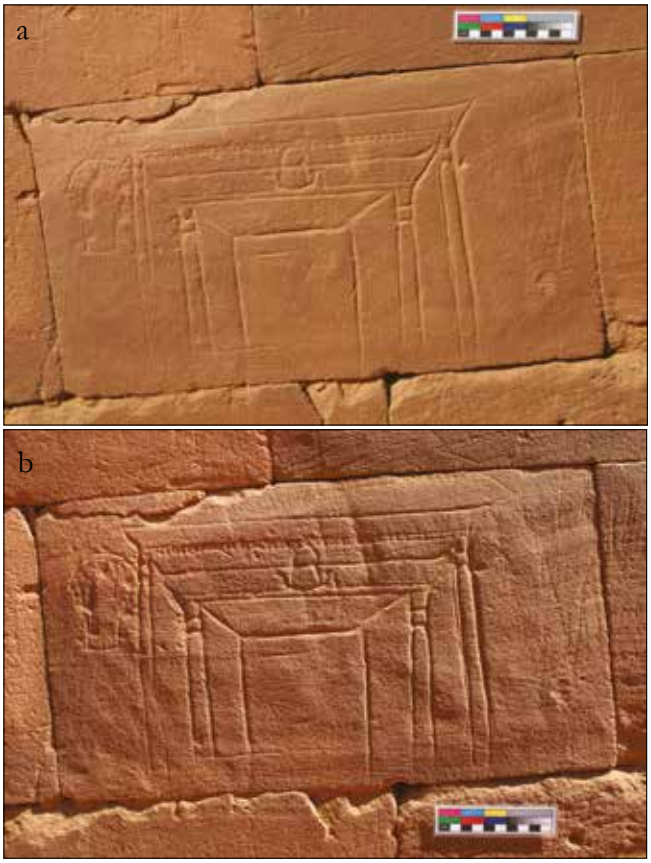

Plate 4. Architectural graffito on wall 513/510 photographed in a. 'soft' light, b. raking light.

[3] Acknowledgement is due to Steffen Wenig and Pawel Wolf for transferring the rights to the publication of the Musawwarat graffiti as well as archival material from Wolf's previous documentation effort to the author. Claudia Näser is thanked for granting the publication rights for Ursula Hintze's (archived) documentation to the author.

out some of the lines, other lines are being obscured at the same time and false 'graffiti entities' may appear in the photographic record. Additionally, information on differences in line colour, which helps in the definition and relative dating of graffiti entities, is usually lost in raking-light photography (Kleinitz 2008a).

In addition to 'conventional' photographic recording methods, the Musawwarat graffiti have also been the subject of two pilot projects testing the application of optical 3D-scanning technology and of 'computational photography' to their documentation. In 2009 3D Structured-Light-Scanning was tested on a small selection of Meroitic period graffiti and groups of graffiti with good results (Kleinitz *et al.* 2009).[4] The 3D-models of the wall surfaces with their graffiti provided highly accurate surface representations and allowed the manipulation of lighting conditions for the better study of the graffiti (Plate 5). However, due to the high cost of specialised equipment and knowledge necessary for data capture and processing, and – at that time – the loss of important colour information during the scanning process, the usefulness of 3D Structured-Light-Scanning for the documentation of large sets of the Musawwarat graffiti was limited.

In the 2011 and 2012 field seasons Reflectance Transformation Imaging (RTI), a relatively new and low-cost 'computational photography' method with a low technological threshold, was successfully tested on a larger sample of graffiti (Kleinitz 2012a). RTI captures surface details photographically in different lighting conditions using standard photographic equipment and it utilises free open-source software for processing and viewing the data.[5] The RTI results from Musawwarat were extremely encouraging although the outdoor field conditions posed various challenges due to the often 'inconvenient' position and/or size of the graffiti, or camera movement because of strong gusts of wind. Nevertheless, data on about 1000 graffiti were captured during two field seasons in more than 450 RTI set-ups, resulting in detailed digital surrogates that support the in-depth study of block surface modifications (see Kleinitz 2012a).

Both methods tested have advantages and disadvantages, and a combination of recording techniques, with the addition of photogrammetry, could be a solution for the documentation of large numbers of graffiti with strongly differing properties (e.g. measurements, positions, state of preservation) (see Kleinitz 2012a). In terms of contributing to the 'virtual preservation' of the graffiti corpus, the methods tested were successful in creating precise high-resolution digital surrogates of the block surfaces with their graffiti. In respect to the study of the graffiti, the RTI files and 3D-models supported off-site work, such as the creation of highly accurate drawings of the graffiti or the study of superimposition evidence.

It has also become clear, however, that digital surrogates can only partially replace 'traditional' on-site descriptive work

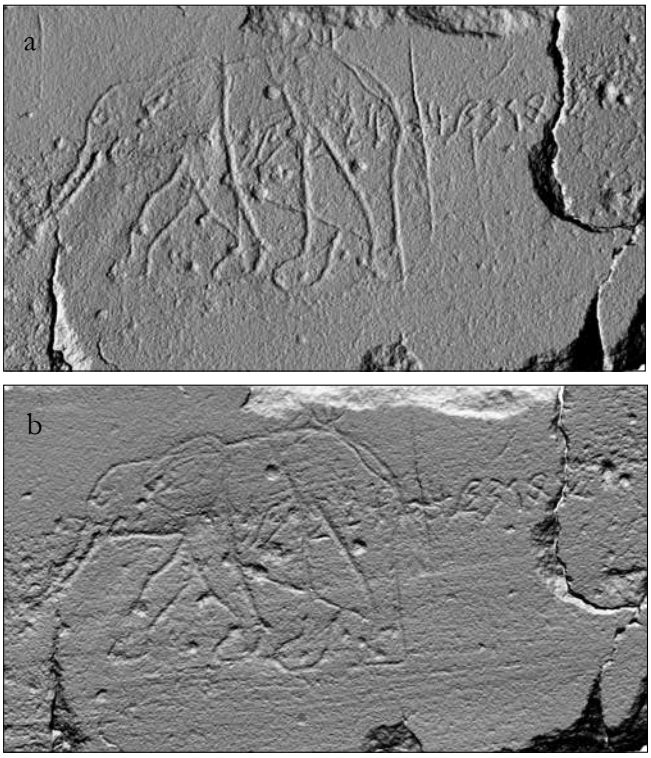

Plate 5. Elephant graffito and Meroitic inscription on wall 215/2015. Orthophoto with a. light coming from left, b. light coming from above (photo: Thomas Bauer).

on a graffito by graffito, block by block and wall by wall basis. The project, therefore, uses standardised block sheets for the descriptive and initial graphic documentation of each block and its graffiti. Information is collected about the block and its surface, such as wall, row and block sequence numbers, position on the wall, measurements, orientation and exposure to the sun, state of preservation, surface colour, and evidence of surface treatment, such as chisel or polishing traces from the building process. All visible artificial lines are sketched in their relative positions to each other and all identifiable graffiti entities are colour-coded and numbered. Each numbered entity – i.e. an identifiable 'motif' or part thereof – is described as follows: measurements (height, width), technique(s), line characteristics and measurements (width, depth), superimpositions (over, under), juxtapositions (one or several 'marking events'), state of preservation.

For the systematic description of the graffiti corpus an expandable hierarchical motif thesaurus was developed on the basis of form properties and/or apparent graffiti content (Kleinitz 2008a). The graffiti are initially grouped into three main categories: inscriptions, pictorial graffiti and markings, and they are then assigned to various sub-categories (see below for examples). Because of the immense diversity within the Musawwarat graffiti corpus in terms of variation in form, both the identification of individual graffiti entities and their description are challenging tasks, especially in situations where block surfaces are not well preserved or many layers of graffiti are present. New form variants and 'motifs' are continuously being added to the motif thesaurus. In terms of defining

[4] Gründer *et al.* (1994) already suggested the application of optical 3D-scanning to the documentation of the Musawwarat graffiti.
[5] See http://culturalheritageimaging.org/ for further information.

graffiti entities and recording superimposition evidence and juxtapositions, project members harvest the maximum information by successively 'building up' the descriptive on-site block documentation under various indirect and direct lighting conditions. The definition of graffiti entities is easiest in the shadow, as colour and other line differences are better visible in 'soft' light. Very shallow lines, in contrast, are best visible in raking light, as hard shadows are created. Lines that are (barely) visible but that do not appear to form an 'entity' are classed as 'indistinct lines'. They are included in the sketch of the block surface and their presence is noted, but they are not described in detail or numbered.

A production workflow was developed for the conversion into publishable drawings of information on the graffiti gathered from descriptions, field drawings, photos and other digital surrogates. Digital drawings are created from photos by alternating between Adobe Photoshop and Illustrator applications, followed by their on-site collation. Direct tracing of graffiti onto transparent plastic sheets was tested during the first field season in 2008, but despite good results this graphic recording method was deemed too time-consuming – partially because of extremely short periods of 'good visibility' – to be applied to a larger corpus of graffiti (Kleinitz 2008a). All data recorded on the Musawwarat graffiti have been organised in a specially designed multi-table Filemaker database that links image and written data as well as comparative and archival material for each wall, block and graffito.[6]

Graffiti categories

Inscriptions

The first category of the Musawwarat graffiti corpus comprises recognisable writing dating to the time the Great Enclosure was in use, such as Meroitic cursive script[7] (see above) as well as the southernmost known Latin inscription (*CIL* III 83) on the African continent. The latter inscription seems to point to diplomatic and/or commercial contacts between Rome and Meroe in the last years of the Meroitic realm (Łajtar and van der Vliet 2006). Inscriptions in Old Nubian, Greek and Arabic languages date to the Christian medieval (*c.* AD 550-1500) and later periods (e.g. Tsakos 2011). They illustrate the (re-)use and appropriation of the site after its original function(s) may have been but a distant memory or entirely forgotten. A number of much younger inscriptional graffiti chronicle the scientific and touristic exploration of the Middle Nile Valley over the past 200 years. They include early inscriptions by Linant de Bellefonds (1822), Cailliaud (1822) and the Royal Prussian Expedition (1844) (Wenig 2009). Most recently, tourists have continued the 'tradition' of graffiti making at the site by adding their own name and date inscriptions, often destroying ancient graffiti in the process. Among the culprits are international visitors like a certain Kolya Bugayev from Belarus in 2009 as well as national travellers like a certain Saher, who managed to inscribe his name and the date of his visit four times on an single day in 2012 (Plate 6). Apart from accelerating surface erosion due to weathering and shadow-seeking domestic animals, modern tourists' inscriptions are the greatest danger to the preservation of the ancient graffiti of Musawwarat (see Kleinitz *et al.* 2009 for examples).

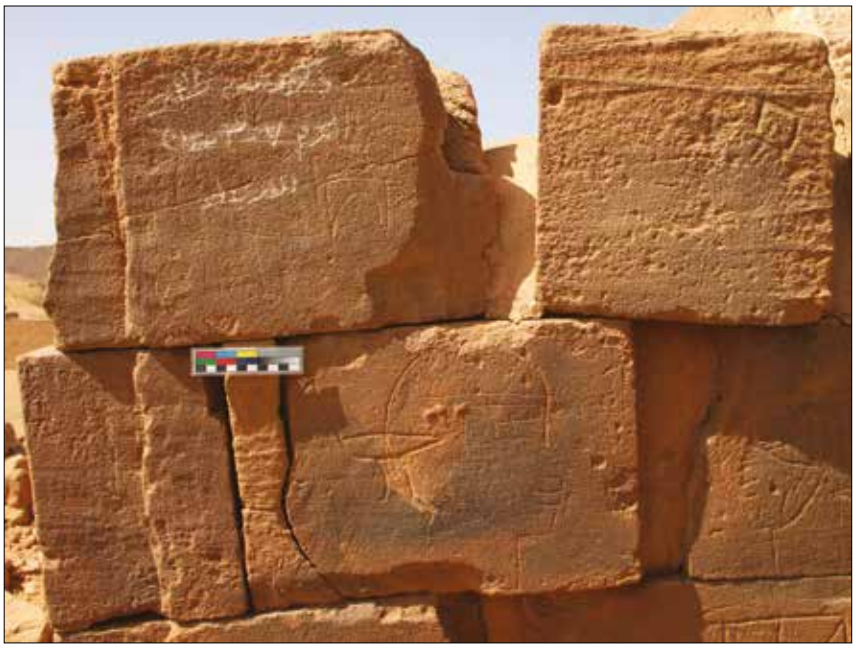

Plate 6. Meroitic graffiti and tourist graffito of 'Saher', window 204/205.

Pictorial graffiti

The second motif category, pictorial graffiti, comprises a wide range of individual and composite figurative and geometric motifs as well as motifs that have both figurative and geometric elements. Figurative graffiti include zoomorphs, anthropomorphs and hybrids (see Plates 1-2, 5-6), plants, objects and architectural features (see Plate 4) as well as Meroitic 'symbols' – and combinations thereof (see above). Geometric motifs are those graffiti that resemble geometric shapes, such as straight, curved, crossing and touching lines, circles, ovals, rectangles, triangles and combinations thereof. Motifs that potentially have both figurative and geometric components are so-called 'property marks' or magico-religious 'signs' that may, for example, consist of a geometric 'base-form' and a figurative Meroitic 'symbol' (Plate 7; for a discussion see Kleinitz 2007).

Many of the pictorial graffiti appear to have been added to the walls of the Great Enclosure as individual, 'stand-alone' entities. In some cases motifs are composed of two or

[6] Database development and curation: Elisabeth Lindinger (University of Applied Sciences Berlin), database concept: Cornelia Kleinitz, Elisabeth Lindinger, Jens Weschenfelder.

[7] The Meroitic inscriptional graffiti of the Great Enclosure will be published by Pawel Wolf and Claude Rilly.

Plate 7. Pictorial motif with both geometric and figurative components, wall 223/228.

more elements that can also occur as individual motifs. Such composite motifs are, for example, an anthropomorph and a camel or an anthropomorph and a horse in the case of 'camel rider' or 'horse rider' motifs. Conversely, two or more physically separate, juxtaposed graffiti entities can form a motif, such as the 'dog-hare' or the 'giraffe(s)-tree' motifs (Plate 8; and see Kleinitz 2007; 2008a). In the latter cases, similarities in technique, line and form characteristics, proximity and/or directionality suggest that two or more graffiti entities were made at the same time and by 'one hand'. In other cases juxtapositions seem to have been 'built up' over time and by different individuals. The narrative quality inherent in the Musawwarat graffiti becomes more pronounced when several

Plate 8. Giraffes and tree, door 516/517.

graffiti entities or elements are composed in more complex ways. This is illustrated in numerous 'hunting' or 'fighting scenes', some of which are clearly mythological. Another prominent example are the so-called 'beer drinkers', two individuals squatting to the sides of what appears to be a 'beer jar', and apparently drinking from the jar with 'straws' (Plate 9).

Various figurative graffiti have been used in proposing one or another interpretation of the Great Enclosure or its components (see above). As graffiti depicting wild animals are common – apart from the above mentioned lions, elephants, giraffes and baboons, these include antelopes, rab-

Plate 9. 'Beer drinkers', wall 204/202N.

bits, rhinoceroses, hippopotami, crocodiles, snakes, birds and fish in greatly varying numbers – Dornisch (in Wenig 2001) suggested that the Great Enclosure served as a trading station for wild animals among other functions. Using evidence from the graffiti corpus, Lenoble (1994, 23) suggested that wild animals were kept at the site and subsequently hunted by the ruler to "prove his physical ability". Shinnie (1967, 94) proposed an interpretation of the Great Enclosure as an elephant-training station on the basis of, among other evidence, graffiti of elephants. One of the graffiti shows an elephant on a diagonal base line, which has been interpreted as representing a scene observed at the site itself, namely an elephant walking up a ramp. Other attempts at interpreting the Great Enclosure on the basis of individual or small selections of graffiti have resulted in similarly unconvincing results, especially as these interpretations usually single out some graffiti and disregard other (nearby) graffiti that may not fit the respective interpretation.

Individual rooms have been attributed one or another function by privileging individual or groups of graffiti over other graffiti located on the same or on nearby walls. This concerns, for example, Wolf's (2001) interpretation of 'royal property marks' as designating a nearby treasury (see Kleinitz 2007). In another part of the Great Enclosure, Eigner (2004) supported architectural evidence for an 'administrative building' by taking lines of dashes as 'tally marks' and an anthropomorph on the same wall as a portrait of an 'administrator' (see also Eigner 2001a). Wenig (2003) interpreted the head of a young male with a 'palm frond' as representing a bride groom, relying on an analogy with recent Sudanese customs across a gap of at least 1500 years. A graffito depicting a 'pregnant woman', which was taken to indicate a concern with fertility at the Great Enclosure, upon close inspection appears to be a typical male figure with a pronounced belly (see Kleinitz 2008a for a discussion). The well-known erotic graffito 'Holy Wedding' received its name from Ursula Hintze (1979), who suggested that the subject matter of the extraordinarily well-made and large graffito may depict a mythological wedding involving gods (and humans), similar to examples from the ancient Near East. Wenig (2002; 2003) interprets the graffito in a more local context, seeing the Meroitic royal couple

depicted. He subsequently suggested that nearby rooms may have served as the place at which the ritual act of conceiving the royal heir could have taken place (see Kleinitz 2008a for a critical discussion). In what way and to what extent the pictorial graffiti refer to actual events at the Great Enclosure still remains to be investigated, however, and any such study will need to take a broader view of the evidence rather than solely considering those graffiti that may suit a given hypothesis.

Markings

The third category defined for the Musawwarat graffiti corpus differs from inscriptions and pictorial graffiti in the techniques employed and in the resulting forms. 'Markings' comprise a range of traces in the sandstone blocks that appear to be the results of activities that did not normally aim at creating a text or an image in the widest sense. Rather, these traces may have been the material side-products of various activities relating to the materiality of the sandstone surfaces and their sacral connotation and context (see Wolf 2001 for the latter). Some markings, such as cup marks (depressions with a roughly circular opening and sloping side walls) and other 'holes' as well as various types of grooves and hollows, involve the removal of larger amounts of sandstone 'dust' from the block surfaces using various forms of extraction (see Plate 3).

Often it is difficult to establish beyond reasonable doubt what techniques were used in creating markings, and documentation has over the years included technique categories such as 'abraded', 'hacked', 'carved', 'cut' or 'drilled', in an attempt to better describe the variation in openings and sections of 'holes', grooves and hollows. The more regular markings are in their form, the more easily distinguishable they are from various weathering phenomena. Cup marks and other markings occur singly, paired or in lose groups, and sometimes they were placed in lines or other patterns. In rare instances they are parts of pictorial motifs, such as in camel motifs where they sometimes appear to represent the feet of the animal (Plate 10). This and other evidence suggest that many of the markings may post-date the Meroitic period and are part of the later reception and re-use of these sites and their perceived 'potency'.

Mapping the Musawwarat graffiti

The ongoing mapping and study of the Musawwarat graffiti corpus suggest that many of the graffiti were not placed randomly across the Great Enclosure. Some motifs appear to cluster on specific walls or sections of the monument (see Wolf 1993-1994 for a similar observation). Possible reasons behind the positioning of the Musawwarat graffiti can be investigated once mapping of the entire corpus is completed. There are some biases, however, which any study of motif distribution at the Great Enclosure will need to take into account. Due to the prevailing north-easterly winds there is a greater likelihood that south-facing walls and their graffiti are well-preserved, while north- and east-facing wall surfaces and their graffiti are often heavily eroded. In order to be able to judge to what extent distribution patterns are due to choice in graffiti placement or rather due to preservation, an evaluation of the state of preservation of each wall and each block surface is a standard part of the documentation strategy (see above).

Plate 10. Multi-technique graffito of camel with cup marks as feet, wall 401/411-414.

Preliminary remarks on the distribution of graffiti within parts of the Great Enclosure are possible at this stage, for example in respect to interior and exterior walls of the three temples (MUS 100, 200, 300) within the building complex. While graffiti are sparse in the interiors of all three temples, exterior walls as well as window jambs and doorways are usually densely covered with graffiti. This may reflect issues of access, with temple interiors reserved for very few authorised individuals only, or it may indicate that the temple interiors were covered with some kind of plaster that did not allow graffiti to be incised into the sandstone block surfaces. Judging from the positioning of the Musawwarat graffiti in respect to the edges of the sandstone blocks the graffiti makers frequently used the blocks as a framing device and it is clear that the block edges must have been visible. This is apparent, for example, in respect to Meroitic cursive inscriptions, which are often placed so as to fit individual block surfaces (see Plate 3). The regularity of many of the finely incised lines – most lines dating to the Meroitic period are between 1mm and 3mm in width – precludes that they were incised through a thick and/or hard plaster (Kleinitz 2008a). Both a fine hard and a thick coarse plaster have been observed on re-used blocks from early building periods of the Great Enclosure, but hitherto no evidence of plaster has been found for the sixth building period from which most of the upstanding walls of the building complex date, i.e. roughly the second half of the 3rd century BC (Hintze and Hintze 1970; most recently Scheibner 2011; Näser 2013). It seems more likely, therefore, that issues of access prevented the interiors of the temples from being intensively marked.

In contrast to temple interiors, some of the chapels may have been more easily accessible, judging at least from the half-preserved room 517, the so-called Western Chapel. This room is one of the most densely marked in the Great

Enclosure and many of the graffiti appear to date to the time the building complex was in use (contra Wenig 2001). The presence of many 'layers' of Meroitic period graffiti on some of the walls of the Great Enclosure not only provides important evidence for the relative chronology of graffiti making at Musawwarat, it also implies that the graffiti do not seem to have impaired the running of affairs at the complex. Indeed, Meroitic period graffiti differ in their states of preservation, even on the same block surfaces, which indicates that graffiti making took place repeatedly across many centuries. Some of the earliest preserved graffiti may date at least to the 3rd century BC as they are found on blocks – some turned upside down – that were re-used in walls dating to the sixth building period. Graffiti that were added much later, during the Christian medieval period or after, are usually better preserved than the ancient graffiti, depending on their location context. These graffiti also differ in the techniques and tools employed, being characterised by combinations of broad straight lines that were deeply incised or abraded into the yellow-brown sandstone crust that had formed over time on the block surfaces.

Facets of the Musawwarat graffiti corpus: lion, elephant and giraffe motifs

As this paper can give only a very brief glimpse of the rich graffiti corpus from Musawwarat, a discussion of a small selection of zoomorphic motifs shall serve as an illustration of the intricacy of the graffiti corpus and its potential for investigating not only the Great Enclosure, but for enriching our knowledge on the very character of Meroitic art. The Musawwarat graffiti comprise a strong component of depictions of wild animals, with elephants, lions and giraffes being among the most prominent. Form and line characteristics as well as superimposition evidence assign most of these graffiti to the Meroitic period. Depictions of wild animals have in the past been used to support interpretations of the Great Enclosure as a hunting palace, a trading post or an elephant-training station (see above). A closer investigation of the graffiti suggests, however, that various animal motifs are not necessarily drawn from observation at the site or its natural environment but may rather reflect aspects of the symbolic universe of the Meroitic world (contra Wolf 1993-1994). Hintze (1979) pointed out that some of the Musawwarat graffiti even seem to refer back to older graphic universes of the Kushite realm and ancient Egypt, rather than relating closely to a lived reality. In what way lion, elephant and giraffe graffiti were images of the 'mind' rather than just documenting an actual presence of these animals at the site or in the wider region shall be discussed below.

Lions are one of the most common zoomorphic motifs among the Musawwarat graffiti. In the form of architectural sculptures and relief decoration lions are prominent in the primary decoration of the monuments of Musawwarat, including the Great Enclosure, the Lion Temple and the Great *Hafir* (Hintze 1971; Hofmann and Tomandl 1987, 95ff.; Eigner 2001b; see Kleinitz *et al.* 2009). The large corpus of lion graffiti within the Great Enclosure is characterised by its great diversity in form and line characteristics, measurements and placement. Lions are depicted in side view, either standing or striding, seated or lying down (Plate 11). Some depictions of what may be lion heads are shown *en face* (Figure 1). Lion graffiti markedly vary in their dimensions, ranging from a few centimetres to roughly 1m in length. Some of the lion graffiti were made with considerable skill and closely resemble examples known from the sphere of Meroitic 'official' art (see Hofmann and Tomandl 1987, 95ff.). At the other end of the spectrum are graffiti that only very loosely resemble the lion form. Judging from superimposition and placement evidence, lion motifs seem to have enjoyed popularity diachronically throughout the Meroitic period.

Plate 11. Seated lion, wall 102/101W.

The popularity of the lion as a motif in primary and 'secondary' building decoration at Musawwarat should probably not come as a surprise in view of the prominence of the Apedemak cult at the site and the role of the lion as an animal associated with the god and the ruler (Hofmann and Tomandl 1987, 95ff.). The lion god himself is depicted prominently in the primary decoration of the Great Enclosure and the Lion Temple (Hintze 1971) and he is identifiable in various human/animal and animal manifestations by wearing his

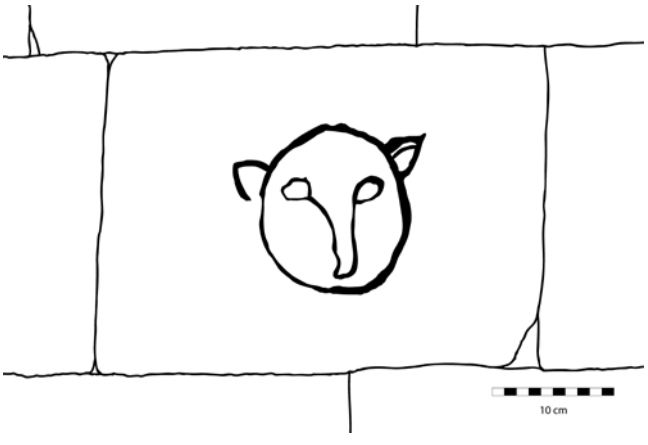

Figure 1. Lion (?) en face*, wall 513/511 (drawing: Jens Weschenfelder).*

typical attribute, the *hemhem* crown (see Plate 1). One of the largest graffiti at the site shows the lion-headed Apedemak hunting an enemy with a lion at his foot (see Hintze 1979). Pending further analysis, the popularity of lion graffiti implies that the lion was of significant concern to the visitors of the Great Enclosure over time and may have been linked to the function and significance of the site of Musawwarat. This would support Wolf's (1999b; 2001) argument – based partially on the inscriptional graffiti of the monument among other factors – that sees the Great Enclosure as the prime Meroitic sanctuary for the god Apedemak, the 'lion's den'. It needs to be kept in mind, however, that the lion was an extremely popular decorative motif not only at Musawwarat but also in the wider Meroitic world (see Hofmann and Tomandl 1987, 95ff.).

Apart from lions, elephants are prominent among the few extant pieces of primary architectural decoration at the Great Enclosure and the Lion Temple, and they are sometimes juxtaposed to lions. Preserved pieces include sculpture, such as the famous elephant wall end on the Central Terrace, as well as column and wall reliefs (Hintze 1971; Hofmann and Tomandl 1987, 90ff.; Wenig 2001; see also Kleinitz *et al.* 2009). Despite the popularity of the elephant 'theme' in the primary decoration of the Musawwarat monuments, elephant graffiti are far less common than lion graffiti. Elephants are depicted in side-view in a detailed, life-like manner (see Plate 5) or somewhat simplified (Figure 2), with their characteristic body shape, trunk and tusks making them relatively easily identifiable. Apart from differences in the amount of detail provided, the main difference between the elephant graffiti is the way their ears were depicted: to the side of the head in one case (see Plate 5) – similar to primary decoration at the site – and as 'butterfly-ears' above the head in the other case (see Figure 2) – as found in elephant depictions in rock art in the open landscape (see Hintze 1979). Dating rock art is notoriously difficult, but it is worth investigating the hypothesis that elephants are rare motifs, both in the Musawwarat graffiti corpus and in rock art of the Meroitic period. Lions are also rare in rock art, but they are common among the Musawwarat graffiti. If rock art and graffiti are taken to simply mirror the environment, and if lions were present in the vicinity of Musawwarat during the Meroitic period (as they were at the time of European exploration in the 19th century), then we could expect the lion to have been a theme in both, graffiti and rock art. Instead, it seems that elephant and lion motifs both relate to the 'official' symbolic sphere of the Meroitic state and do not seem to have been appropriate or relevant themes for rock art in the wider landscape.

In contrast to elephants and lions, giraffes do not appear to have formed part of the primary architectural decoration at Musawwarat. They are however, a common motif in the graffiti corpus. Giraffe graffiti were found in various building contexts across the Great Enclosure. Similar to lion motifs, giraffes are characterised by a great diversity in form characteristics, even though they are more consistent in their size range. On one end of the spectrum giraffe graffiti are depicted with great attention to detail, such as coat patterning and even the mane (Plate 12). On the other end of the spectrum, 'schematic' giraffes with their limited amount of visual information can only be identified on the basis of a few characteristic form properties, such as their long neck. Most of the giraffe graffiti fall somewhere between these 'life-like' and 'schematic' extremes, with some characterised by their flowing lines but lack of clear detail and others characterised by their more square bodies with coat markings depicted as a grid (see Plate 8). Judging from the positioning of their legs, more life-like giraffes seem depicted in movement, walking

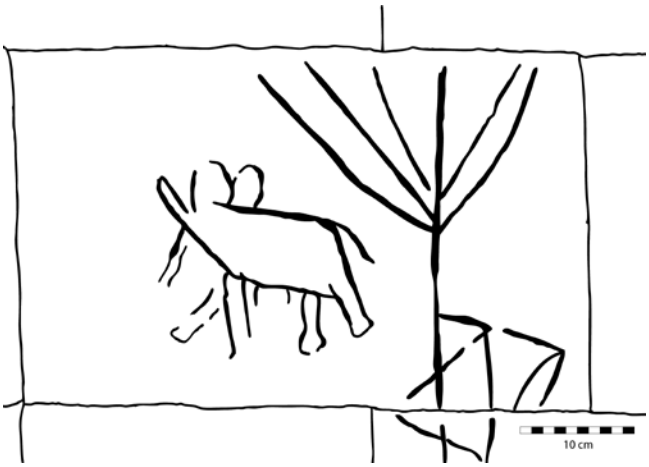

Figure 2. Elephant and 'tree', wall 517/521 (drawing: Jens Weschenfelder).

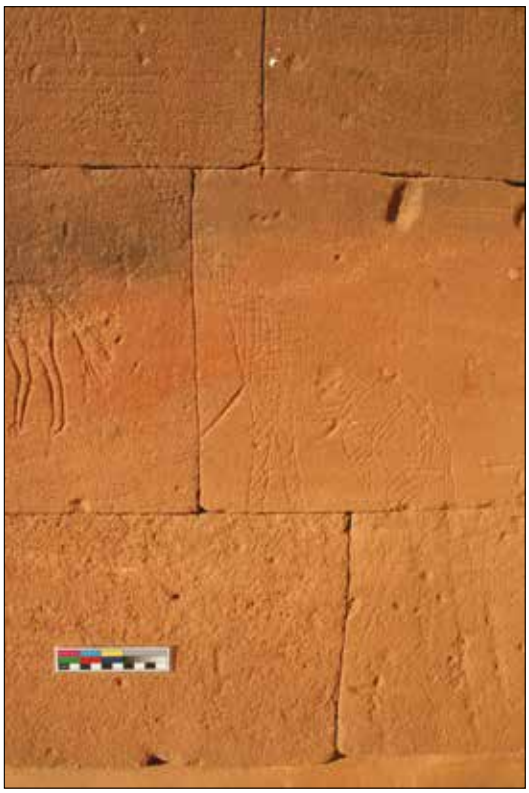

Plate 12. Life-like depiction of a giraffe, wall 517/513.

or running. The less visual information is contained in the giraffe graffiti, the more static they appear. Examples of this form spectrum are in some cases found in close proximity to each other, for example in the 'Western Chapel' (room 517) and its doorway.

Although giraffes are not part of primary decoration at the monuments of Musawwarat, they are a popular theme in other contexts, such as pottery decoration (see Hofmann and Tomandl 1987, 108ff). Giraffe graffiti composed of 'flowing lines' resemble painted polychrome decoration on Meroitic fine ware (Woolley and Randall-MacIver 1910, pls 41-43), while giraffes with square bodies and grid-like coat markings resemble incised, stamped and impressed decoration on broadly contemporary handmade Meroitic pottery (e.g. Vila 1967, 183; Rose 1998, 171f.). Such apparent similarities require further investigation, but it appears that at the same time in the Meroitic world, giraffes were depicted in different ways. This may be because of differences in the amount of control afforded when using different tools and techniques (painting versus incision, stamping or impression) and/or access to different graphic rendering traditions that the makers of the fine and handmade wares drew from. Giraffes similar in manner of depiction to the 'square' giraffes of the handmade pottery and of the Musawwarat graffiti are also found in the pecked rock art of the Fourth Nile Cataract (Kleinitz 2008b; 2012b). In rock art and graffiti, but also in pottery decoration, giraffes are consistently juxtaposed with other sets of motifs. This concerns the common pairing of giraffe(s) and 'tree' in the 'giraffe(s)-tree' motif, and the juxtaposition of giraffes and so-called 'property marks' or magico-religious 'signs' (Woolley and Randall-MacIver 2010; Rose 1998; Kleinitz 2007; 2008b; 2012b). Rather than designating giraffes (apparently grazing from trees) as motifs drawn from the natural environment, this evidence indicates that they may have been a popular motif relating to the magico-religious sphere of the Meroitic world, and that it was considered appropriate to place them in various object, built and landscape contexts.

Outlook: the (virtual) preservation and presentation of the Musawwarat graffiti

Ongoing research within the Musawwarat Graffiti Project has been illustrating the broad palette and intricacy of graffiti writing and image making at the Great Enclosure from the Meroitic period until today. As one of its main contributions, the project is in the process of opening up the graffiti corpus from this ancient sacral centre to archaeological research. It investigates themes relating to the role(s) the Great Enclosure and its individual parts may have played over time, as to the authors and contexts of graffiti making and, in a more general perspective, it examines various facets of the nature of art and writing in the Meroitic world. It also focusses on later graffiti that mark the appropriation of the ancient space of the Great Enclosure during the Christian and Islamic periods, and by explorers and tourists over the past 200 years. As a heritage resource, the historical graffiti are an asset, since they draw interest from modern visitors as traces of previous visitation and commentary. However, as existing graffiti may encourage visitors to add their own signatures, historical graffiti must be included into the overall presentation and protection strategy for the Great Enclosure, and should not be left 'un-presented'.

Off-site, the Musawwarat graffiti corpus is successively being made accessible via its online platform, the Musawwarat Graffiti Archive (http://musawwaratgraffiti.mpiwg-berlin.mpg.de), which shares this research globally. At the heart of the Musawwarat Graffiti Archive is a work-bench environment allowing the online publication of large image collections together with related extensive and varied data sets via an easily accessible web interface. Descriptive data are extracted from the project database and systematically linked to an extensive image collection - from overview photos and ground plans down to tracings and detail photos at the level of single building blocks and graffiti. All photos are presented using an image viewer that allows the user to zoom in and inspect images at the highest resolution even on low-bandwidth connections. Images can also be annotated and referenced for use in online publications. The web presentation of the Musawwarat Graffiti Archive offers systematic access to the graffiti via database searches (i.e. a 'browse' function) and via hot-spots on overview images (i.e. an 'explore' function). In its first version the Musawwarat Graffiti Archive presents data on Complex 300 in the eastern part of the Great Enclosure. It is meant to be continually updated, and it will be extended both in breadth with more material and in depth with the integration of new types of media like RTI images, 3D-models and GIS integration. The Musawwarat Graffiti Archive can be understood as an online publication of large archaeological data sets that would be impossible to affordably publish in traditional paper format only, and as a contribution to the virtual preservation and presentation of Sudan's cultural heritage.

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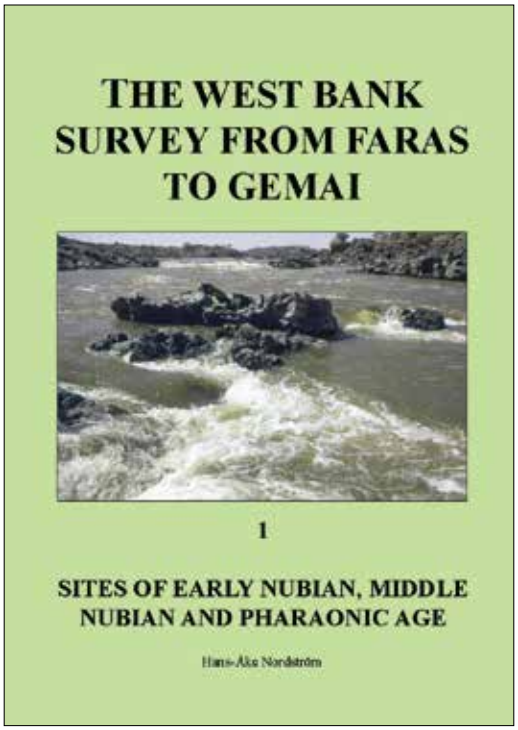

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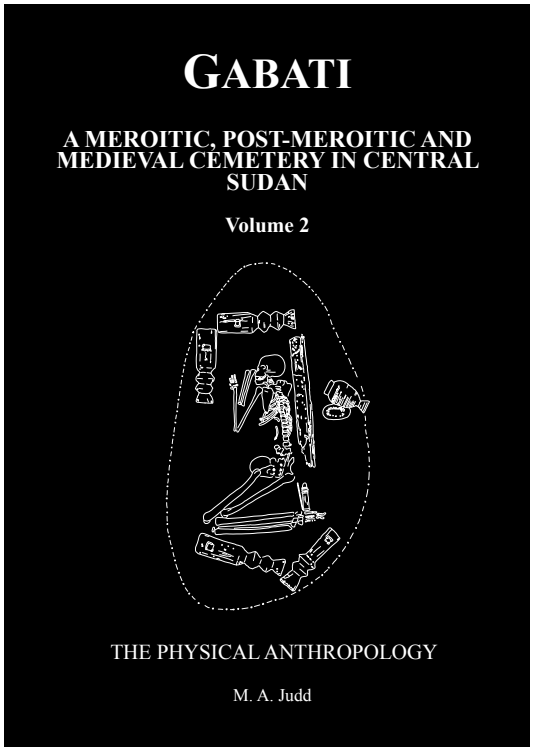

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View upstream along the Wadi Murrat from the late 19th century Anglo-Egyptian fort. The pharaonic inscriptions are amongst the trees at the wadi *edge in the far centre (photo D. A. Welsby).*

Horus, Lord of the Desert. A natural rock outcrop along the route from Buhen towards Wadi Murrat (photo D. A. Welsby).