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## SITE MANAGEMENT AT MUSAWWARAT ES-SUFRA 2014/15: CONCEPTS, MEASURES AND PERSPECTIVES

### INTRODUCTION

The World Heritage Site of Musawwarat es-Sufra is a perfect case for illustrating the dilemma heritage professionals face when trying to identify priorities for intervention measures at complex heritage sites which will rapidly absorb even the most lavish funding with regard to their preservation and presentation. The Great Enclosure – Musawwarat’s main monument – alone consists of 5 km of running walls, without a single metre in an unimpaired condition. While many resources have gone into physical conservation measures in the last two decades, site presentation efforts have been much more limited and *ad hoc* in nature.<sup>1</sup> Consequently, the current five-year funding period of the Archaeological Mission to Musawwarat, which is supported by the Qatar-Sudan Archaeological Project (QSAP),<sup>2</sup> focuses on developing – and starting to implement – a more comprehensive and integrated approach to site management, preservation and presentation. The first project year 2013/14 was used to determine the basic parameters of the envisaged management plan, conduct basic condition assessments on both a site-wide and monument-specific scale, and implement inaugural measures within the identified work programme.<sup>3</sup> The main tasks of the second project year were to move immediately towards the implementation of core measures identified in the planning process of the previous year and to advance the programme itself.<sup>4</sup>

This schedule follows a strategy which had been identified as the most appropriate and practical way of dealing with site management at Musawwarat: Rather than breaking the development and the implementation of a comprehensive site management plan into two discrete, consecutive steps – which always involves the danger that actual measures lag far behind the planning and may finally remain unimplemented<sup>5</sup> –, site management planning at Musawwarat is understood as an incremental process which is closely intertwined with the implementation of measures identified during the planning. On the one hand, this link does secure a direct check on the feasibility of concepts and interventions developed in the planning process. On the other hand, experiences from actual implementations feed back directly into the planning process, e.g. by offering parameters for the resources needed to execute individual measures. By preventing the decoupling of planning and implementation phases, this approach ensures that planning is realistic and within the horizon of available resources and thus helps to produce the best possible results. In this respect the approach follows the thinking of Martha Demas<sup>6</sup> that “the aim of planning is not to decide how to spend a pot of money but to make decisions about what to do within the constraints and resources at hand. Nor is the aim of planning to solve all the problems of a site; it is more satisfying and more sustainable to aim for small incremental changes from present conditions to better conditions than risk being thwarted by

1 Cf. Kleinitz and Näser 2014 for a short assessment of the site’s conservation and presentation history.

2 See <http://www.qsap.org.qa/en/>.

3 See Kleinitz and Näser 2014.

4 Fieldwork of the second QSAP project year at Musawwarat was conducted from 05/10/2014 to 08/11/2014, from 07/01/2015 to 11/04/2015 and from 15/08 to 24/08/2015. The team members involved in site management, conservation and community project components were Claudia Näser (project director), Cornelia Kleinitz (deputy project director), Zarooq Bakri Mohamed (NCAM inspector), Al-Fatih Mohamed Ali (social anthropologist), Kurt Beck (social anthropologist), Peter Becker (architect), Jörg Bode-mann (building tinsmith), Christiane Dorstewitz (archae-

ologist), Tobias Flacke (conservator), Fede Hamann (conservator), Jan Hamann (conservator), Olaf Heistermann (assistant), Bernhard Irmeler (architect), Stefan Kownatzki (building tinsmith), Volker Link (structural engineer), Thomas Lucker (conservator), Mohamed Mohamed el-Tayeb Badri (logistics), Sebastian Speiser (conservator) as well as up to 40 local workmen. All work was undertaken in close cooperation with the National Corporation for Antiquities and Museums (NCAM). All colleagues at NCAM and QSAP are sincerely thanked for their support. Special thanks go to Dr Abdelrahman Ali Mohamed and Dr Saleh-eldin Mohamed Ahmed for their help.

5 Cf. e.g. Zan et al. 2015 for a series of cautionary tales.

6 2002: 49.

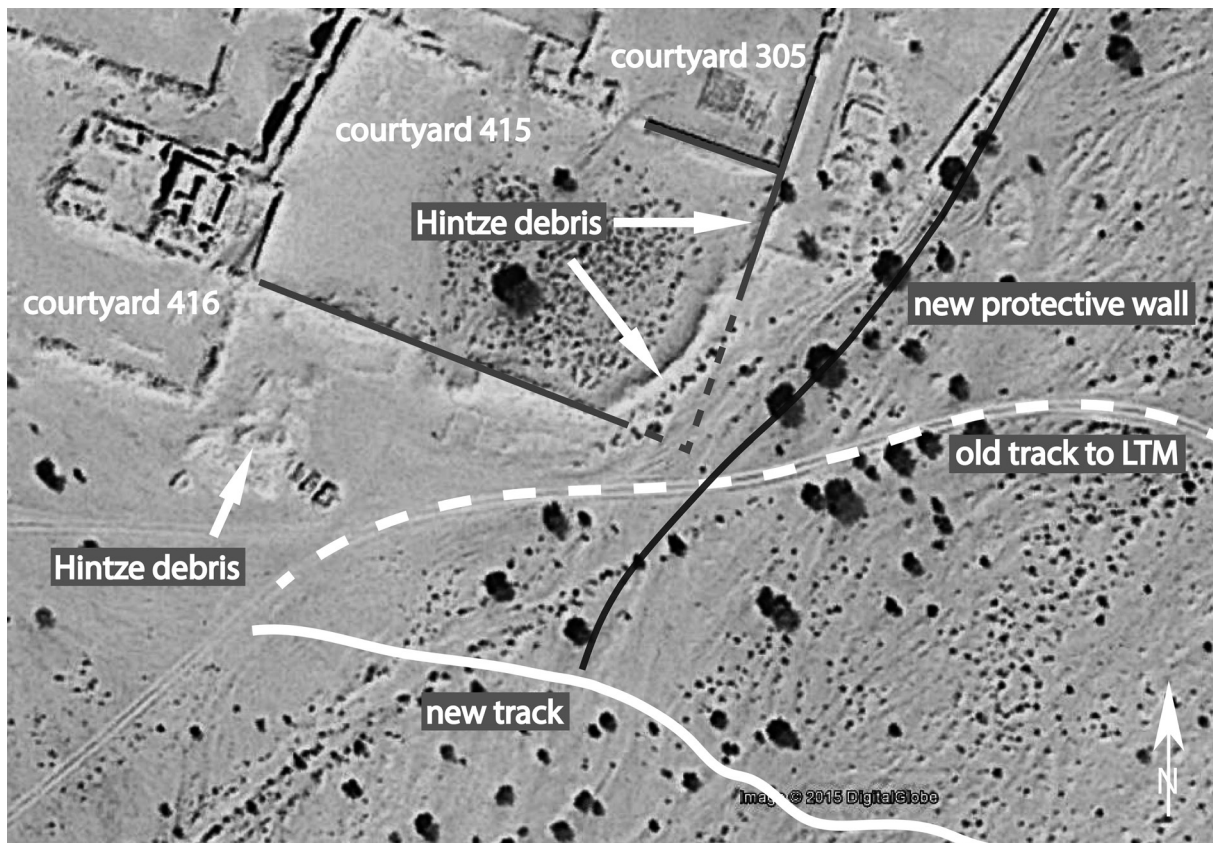


Fig. 1: Schematic representation of site management measures undertaken in the course of redesigning the area southeast of the Great Enclosure (image: Christiane Dorstewitz)

unrealistic expectations of achieving major changes”. The following sections outline the work programme and the measures implemented in the current second QSAP-funded project year at Musawwarat. A final section will summarise the more conceptual results which were gained from the work experiences at the site and outline how they will feed into the next steps in the planning process.

#### RELOCATING THE TRACK FROM THE GREAT ENCLOSURE TO THE LION TEMPLE

The first measure of the autumn season 2014 was to relocate the track from the Great Enclosure to the Lion Temple as part of the effort to reorganise the access to the main monuments of the site (figs. 1–2). This measure freed a considerable space at the southeastern corner of the Great Enclosure where the redesign of the main entrance towards the monument is to unfold. The old route to the Lion Temple was blocked and the proposed new route further south prospected so as to make sure that no hitherto unknown archaeological sites would be compromised. After these preparatory measures, the new route was prepared and levelled by manual

labour to ease its use. The measure was successfully completed as the new route is now unanimously used by visitors and local traffic alike.<sup>7</sup>

#### THE LION TEMPLE PROJECT<sup>8</sup>

The most extensive single project component towards the preservation of the site’s monuments was the general overhaul of the roof construction of the Lion Temple and the associated measures taken towards a complete rehabilitation of this monument.<sup>9</sup> Project planning started in May 2014, followed by a one-

<sup>7</sup> Cf. the Google Earth image of 15/12/2014.

<sup>8</sup> Team members involved in this projects were Jörg Bode-mann (building tinsmith), Christiane Dorstewitz (archaeologist), Tobias Flacke (restorer), Olaf Heistermann (assistant), Bernhard Irmeler (architect), Stefan Kownatzki (building tinsmith), Volker Link (structural engineer), Thomas Lucker (conservator), Mohamed Mohamed el-Tayeb Badri (logistics), Claudia Näser (archaeologist), Sebastian Speiser (restorer) and Zaroq Bakri Mohamed (NCAM inspector) under the direction of Peter Becker (architect).

<sup>9</sup> For a concise description of the temple’s history and its previous condition see Kleinitz and Näser 2014. For a more detailed report of the roofing project see Becker, this volume.



Fig. 2: Blocking the old track towards the Lion Temple under the supervision of Sheikh Mohamed Ahmed al-Dali, in the left part of the image (photo: Claudia Näser)

week visit to the site by the major project participants in October 2014. The purpose of this visit was to assess the condition of the individual parts of the original roof construction to confirm on-site which parts would need to be replaced due to wear or redesigned due to malfunctions of the original construction, to collect final data for the static calculations and to assess which materials would be needed for the actual building measures. In terms of practical measures, this step included the temporary removal of parts of the roofing sheets and the suspended ceiling of *birsh* mats (fig. 3) in order to ease the investigation of the construction from underneath.

The ‘autopsy’ confirmed that the original tin roof of 1970, whose multiple cracks and open joints allowed moisture to penetrate into the wall tops, was beyond repair. The original steel subconstruction was assessed with regard to static’s requirement and its condition. It was judged to be adequately dimensioned and completely intact, with no interventions or replacements being necessary. The only exception was the six bearings of the subconstruction which had been cemented into the temple walls and which needed to be replaced by slide bearings as the inflexible construction of the original bearings resulted in friction from the wind load impinging on the roof and transferring into the masonry. This in turn led to the enlargement of cracks in the relief temple walls under the bearings.



Fig. 3: Preparing the roof of the Lion Temple for investigation, October 2014 (photo: Claudia Näser)



Fig. 4: Excavations at the southern and northern pylon towers of the Lion Temple, October 2014 (photo: Claudia Näser)

The comprehensive investigation of the potential causes of these cracks was continued with excavations in the area of the temple's two pylon towers (figs. 4–5).<sup>10</sup> The findings showed that the cracks had not been caused primarily by the inadequate roof bearings – although they negatively impacted them –, but by an accelerated dehydration of the mighty unreinforced concrete body which underlies the reinforced concrete foundations of the temple proper (fig. 5). This dehydration had prevented the proper setting of the concrete body, resulting in an increased porosity of its outer shell, which then led to a localised settlement of the standing walls in the pylon area and the cracks between the front and the rear part of the temple. The investigation also showed that while the cracks do not impair the static of the building or any of its parts in any way, they cannot be effectively removed as they continue into the lowest part of the tripartite foundation construction, namely the unreinforced concrete body. As an aesthetically adequate handling, the insertion of deliberate expansion joints has been suggested and will be implemented within the upcoming project dedicated to the conservation of the temple's relief walls and the re-plastering of its reconstructed wall sections.

<sup>10</sup> Southern pylon tower: front, towards east; northern pylon tower: rear, towards northwest.

The final task of the on-site survey in October 2014 was to determine whether the main materials needed for the new roofing (profiled zinc sheets, corrugated zinc-plated steel sheets, translucent polycarbonate sheets) could be purchased in Sudan. A reconnaissance of facilities in Shendi and Khartoum showed this not to be the case. Consequently, the next step of the project was to purchase these materials in Berlin – two tons, all-in-all – and to organise their shipment to Port Sudan. The consignment left Berlin mid-December 2014 and arrived in Port Sudan mid-February 2015. After all formalities had been resolved, the consignment was transported from Port Sudan to Musawwarat by a hired lorry in early March. In the meantime, starting from January, protective covers of plastic sheets and *birsh* mats for the inner relief walls and the columns were put in place, the old roof including the remainder of the suspended *birsh* ceiling and its pebble cover was dismantled and further preparatory works were undertaken (fig. 6). Five of the six newly designed slide bearings were installed; the southwestern bearing will be exchanged in the coming season as the constructive preparations for its insertion impact a sensitive wall area which needs to undergo conservation treatment first. The hardwood beams of the inner ceiling had been left in place, but several damaged segments were exchanged. After this, a new *birsh* ceiling was intro-



Fig. 5: The foundations of the reconstructed Lion Temple consisting of a mighty unreinforced concrete body underneath the actual reinforced concrete foundations, the brick-lining of which has been supported by a concrete ‘shirt’ (preserved on the right side), exposed in the trench in the rear of the northern pylon tower (photo: Claudia Näser)

duced and stabilised with a pebble cover. Preparation of the manually pre-fabricated imported roofing materials was completed on-site by the project’s two tinsmiths. The installation of the main roof of corrugated zinc-plated steel sheets was complemented with additional elements, namely the polycarbonate translucent sheets of the light strips as well as the zinc-plated steel gutters, the covers of the gargoyles and the attica between the two pylon towers. Finally two new crack monitors were installed at the interior lateral walls.<sup>11</sup> The project was successfully completed on 16 March 2015.

Next to measures concerning the Lion Temple proper, another task was to continue the rehabilitation of the monument’s periphery. The major activity in this respect was the construction of a low diversion wall about 200m southeast of the temple in order to change the flow direction of the local surface runoff by blocking a *khōr* which runs at the northern edge of the wadi towards the temple and compromises its southern periphery. The wall is about 50m long, 0.8m high and built of sandstone rubble which had

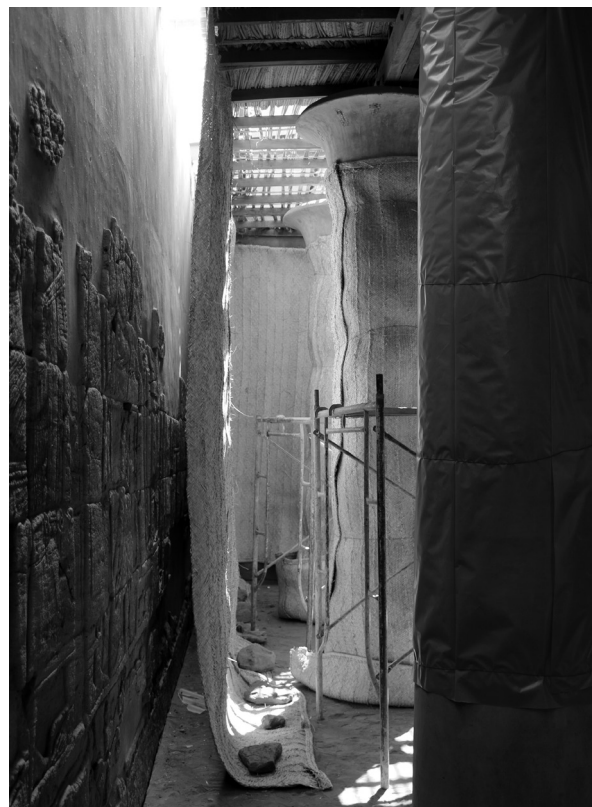


Fig. 6: The interior of the Lion Temple during the building measures, January 2015 (photo: Claudia Näser)

<sup>11</sup> Readings of these monitors on 10/04/2015 and 24/08/2015 confirmed that the cracks have not been negatively impacted by the renewal of the roof construction.



Fig. 7: The embankment of excavation debris delineating courtyard 415 towards southeast (photo: Claudia Näser)

been taken from the cleared *kom* of excavation debris south of the Great Enclosure (see next section). Surface runoff in this *kbhor* had already damaged the service gate of the modern fence securing the area of the Lion Temple as well as the foundations of several fence posts. The effectiveness of the wall will be monitored and its construction adjusted if necessary.

#### DEVELOPING A NEW VISITOR ACCESS ROUTE TO THE SITE: REDESIGNING THE SOUTHEASTERN PERIPHERY OF THE GREAT ENCLOSURE<sup>12</sup>

Since the first investigations in the 1960s it had been believed that the southeastern corner of the Great Enclosure was not preserved.<sup>13</sup> Sondages undertaken in the 1990s seemed to confirm this assumption.<sup>14</sup> Hintze had deposited an embankment of

excavation rubble stretching from the preserved corners of walls 415/E and 415/S, thus forming an arbitrary border of courtyard 415 (figs. 1, 7). Visually dominating, this embankment conveyed the feeling that it outlined the original courtyard wall despite the fact that it ran up to 20m west of it.

With the new access to the site being planned to eventually use the ancient main entrance to the Great Enclosure (fig. 8: gate 305-E), the visitor route from the parking lot in the south of courtyard 415 will have to follow the eastern border of courtyard 415 towards the north (figs. 1, 8). It was therefore decided to investigate to which degree the ancient courtyard wall, which also represents the outer enclosure wall of the monument in this area, was really lost, or could still be traced at least in foundations – which would outline the original course of the wall and could be incorporated in a low brick reconstruction of the original corner.

Excavations of six trenches along the 70m of lost wall in the east and south of courtyard 415 (fig. 8: 415.E1–3, S4–6) in the fall season 2014 indicated that indeed no substantial remains of wall 415/S were left beyond where it is still preserved above ground to the present day. In contrast, the foundation layer of wall 415/E could still be traced up to 20m south of corner 415/305/E (fig. 8). An unexpected discovery was a hitherto unknown entrance gate, 415-E, which came to light in trench 415.E3 (figs. 8–9). Only its northern side is preserved in a single foundation layer, the southern part having been swept away completely.

12 Team members involved in this project were Peter Becker (architect), Christiane Dorstewitz (archaeologist), Bernhard Irmeler (architect), Mohamed Mohamed el-Tayeb (logistics), Claudia Näser (archaeologist) and Zarooq Bakri Mohamed (NCAM inspector).

13 See the general plan of the Great Enclosure as published e.g. in Hintze 1967–1968.

14 See the map of the sondages published in Wenig and Wolf 1998, plan 6. Dieter Eigner is thanked for supplying his field notes on these sondages, particularly 415.S4. He writes: “Suche nach SE-Ecke des Hofes 415 erfolglos. Fläche von ~ 3.00/3.00 m bis etwa Niveau 9.00 abgetieft. Mauerwerk nicht mehr vorhanden, auch kaum Versturz. Unterschwemmt?”

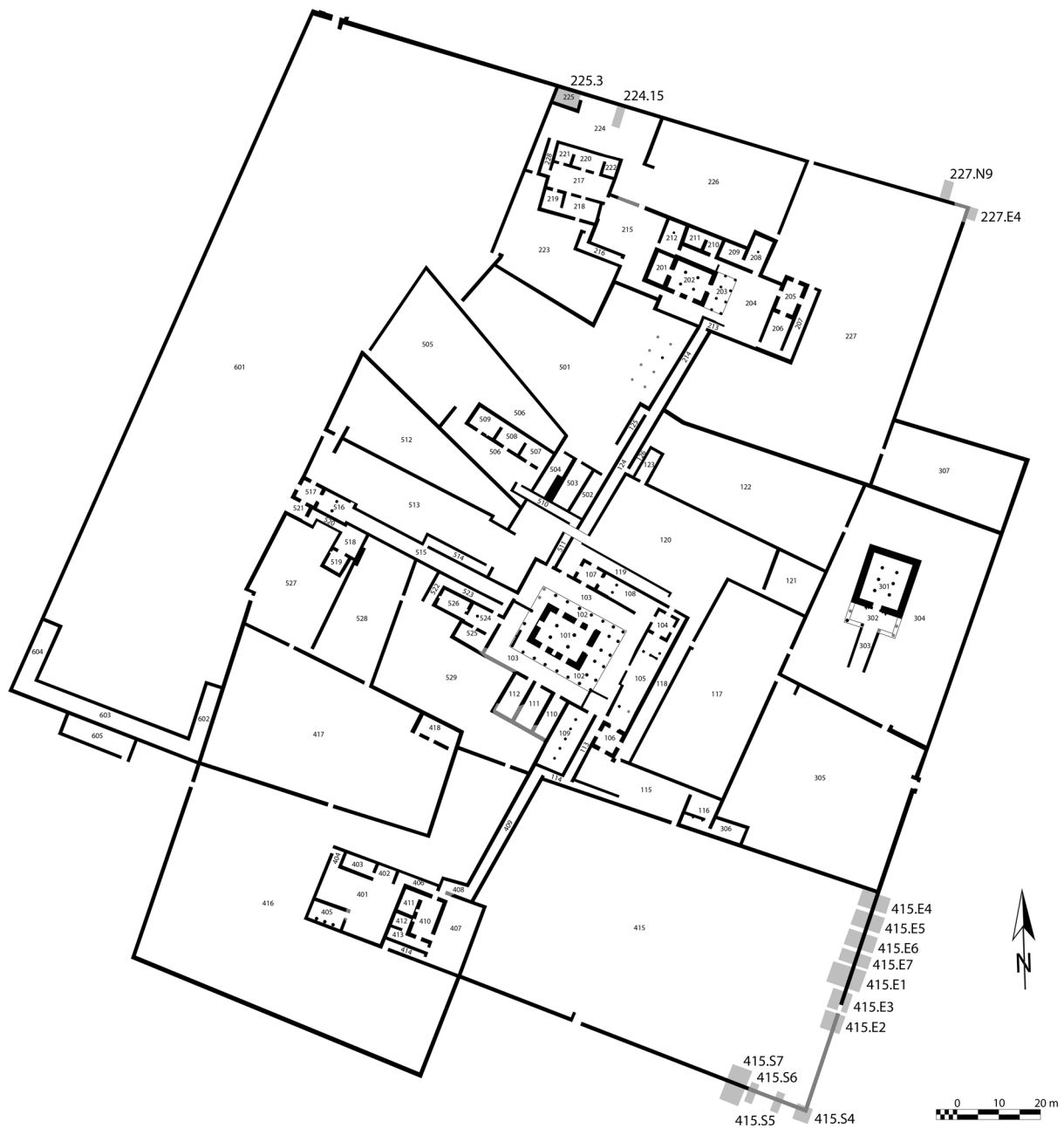


Fig. 8: Ground plan of the Great Enclosure with excavation areas of the current project year 2014/15 indicated (adapted from P-IA/11, cartographic and graphic realisation: Christiane Dorstewitz)

In view of these findings it was decided to enlarge the archaeological investigation of wall 415/E in the spring season 2015 (fig. 8: 415.E4–7, S7) in order to completely uncover the preserved wall section and to evaluate the possibility of its reconstruction in brick masonry to delineate its course above ground. The excavation produced another unexpected result: The northernmost 20m of the Hintze embankment running up against corner 415/305/E (figs. 1, 7–8, 10) contained substantial *in situ* remains of the wall even above the present-day ground surface, which had simply been covered with the excavation debris in

the 1960s. In addition, up to six layers of *en bloc* wall collapse were revealed (figs. 10–11) which had the potential to be reassembled in their original position. With these findings, more than 20m of the ancient enclosure wall and a hitherto unknown entrance gate were regained.

Finally, the remains of the abovementioned ‘missing’ corner of the enclosure, i.e. the southeastern corner of courtyard 415, were also detected. The reopened trench 415.S4 (fig. 8) produced a substantial layer of wall collapse, starting from the local height of 8.93m, going down up to about 8.5m (fig. 12).

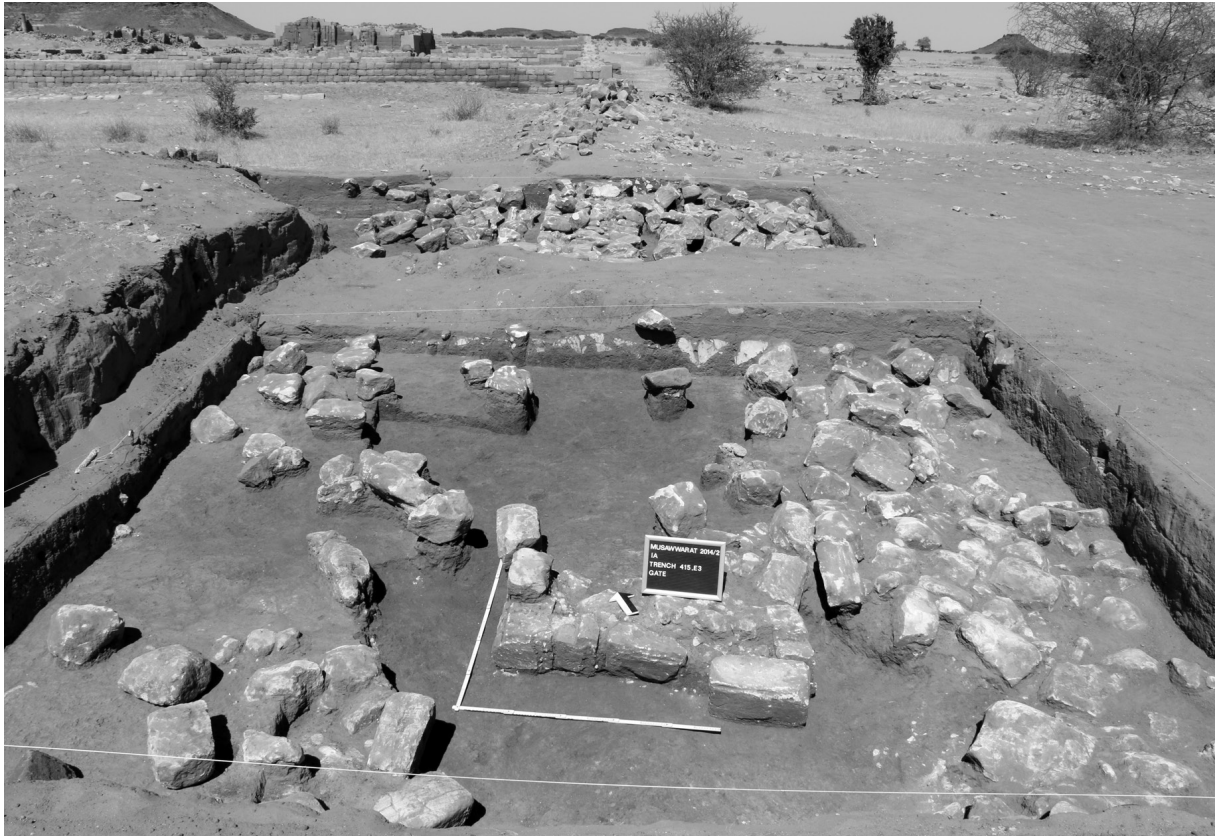


Fig. 9: The newly discovered entrance gate into the Great Enclosure, 415-E, in trench 415.E3 from the south (photo: Claudia Näser)

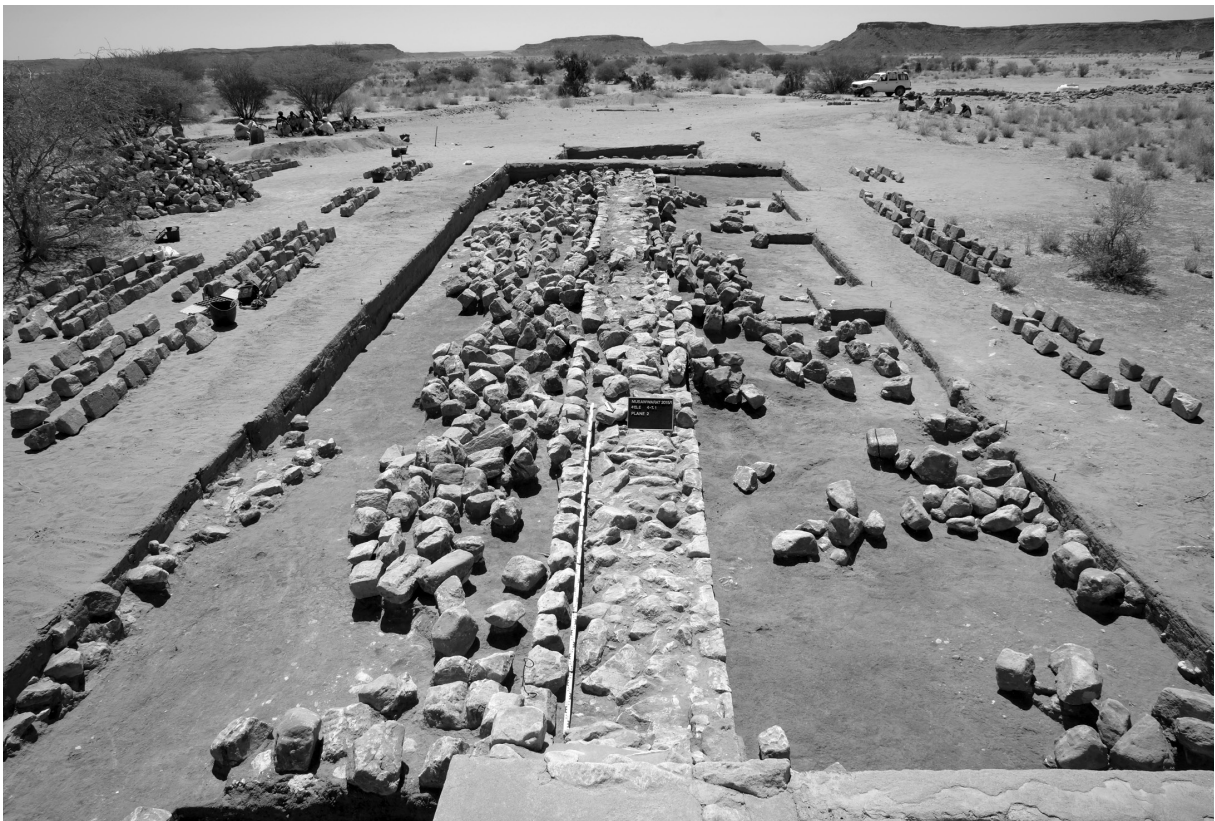


Fig. 10: Trenches 415.E4, 5, 6, 7, 1 (after documentation and removal of bulks) and 415.E3 in the south with the recovered segment of the enclosure wall 415/E (photo: Claudia Näser)



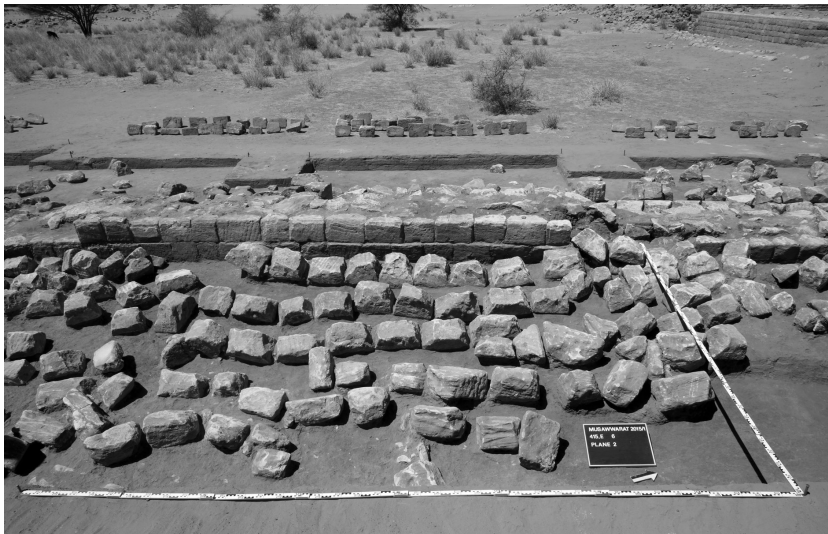


Fig. 11: Trench 415.E6 with up to two layers of the wall 415/E *in situ* and up to six layers of *en bloc* block collapse (photo: Claudia Näser)

While the stratigraphic record and a considerable spread of blocks towards the south and east, i.e. the direction of the wadi, proved heavy fluvial activities, the trench also revealed a corner situation with an actual corner block almost in alignment with the reconstructed north-south course of wall 415/E (fig. 12).

After the excavation had been completed, the reconstruction of wall 415/E started (fig. 13), following the concept established in the previous years.<sup>15</sup> By the end of the season, the wall was reconstructed over a course of almost 20m up to six courses high. The remaining parts will be finished in the upcoming project year.

When it had become clear that substantial segments of wall 415/E were preserved and could be conserved to delineate the eastern edge of courtyard 415, it was decided to completely remove the embankment of excavation debris running southwest of it (figs. 1, 7). More than 200m<sup>3</sup> of sand and rubble were cleared and deposited in the wadi. This re-deposition was undertaken in a way that effectively closed the westernmost *chor* of the wadi drainage east of the Great Enclosure which had posed a serious threat to the easternmost part of the monument in seasons of high

precipitation. Simultaneously, the protective rubble and sediment platform which had been constructed east of the Great Enclosure in spring 2014 to prevent the flooding of this area by surface runoff, and the low camouflaged stone wall which secured this platform towards the wadi<sup>16</sup> were extended more than 40m towards the south (figs. 1, 14) to consolidate and eventually enlarge the access area with the parking lot south of the Great Enclosure for future development.

The redesign of the access area itself continued with the

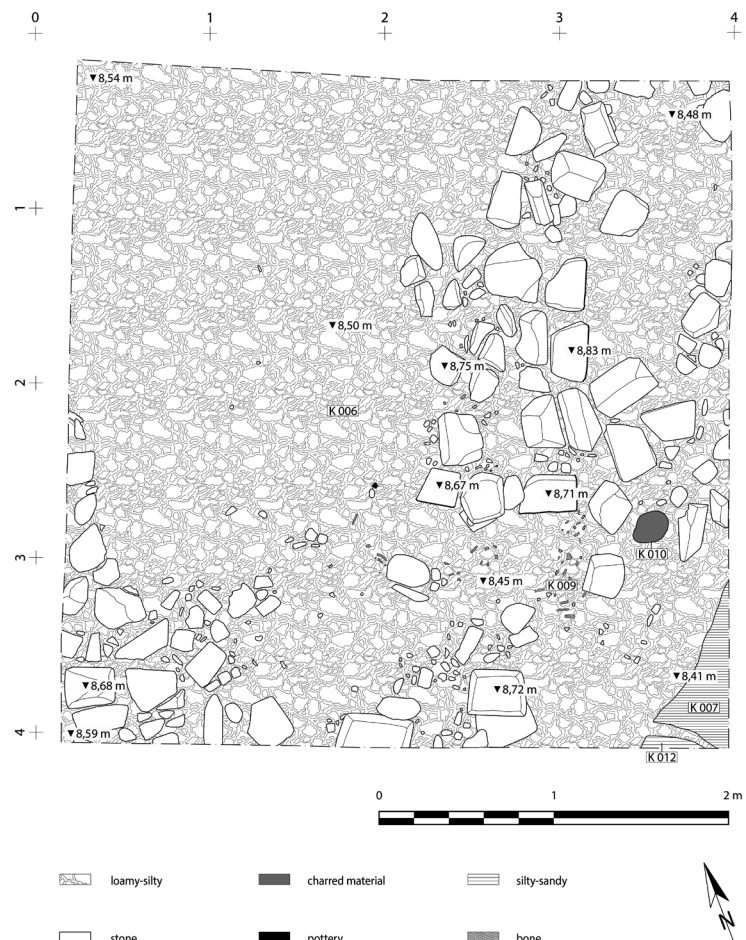


Fig. 12: The lowest layer of wall collapse in Trench 415.S4 with the supposed corner indicated in bold lines (drawing: Claudia Näser)

15 Cf. Scheibner and Mucha 2006, 2007, 2008, 2009 and Kleinitz and Näser 2014.

16 See Kleinitz and Näser 2014: 15–16.



Fig. 13: Reconstruction of wall 415/E (photo: Claudia Näser)

removal of another *kom* of 1960s excavation debris in the western part of the current parking lot (fig. 1). More than 150m<sup>3</sup> of sand and rubble were moved to enlarge the platform and the protective wall at the edge of the wadi. On top, stone debris from this *kom* was used to build the diversion wall east of the Lion Temple (see previous section). The clearing of the *kom* was not merely an aesthetic measure, but a necessary intervention to prepare the area for the construction of the fence around the Great Enclosure, envisaged for the upcoming project year 2015/16,<sup>17</sup> as the *kom* had obscured the projected course of the fence at the southeastern corner of the adjacent courtyard 416 (figs. 1, 8, 15). The partly collapsed stone repositories in this area (fig. 1) were reconstructed *in situ*.<sup>18</sup>

With the removal of the two mounds of excavation debris and the regained parts of wall 415/E the spatial impression of the southeastern perimeter of the Great Enclosure has been completely altered. Courtyard

415 is now perceived in its true dimensions as is the extended linear eastern front of the Great Enclosure. The process of re-designing this area has been successfully continued as a seminal step in its development as the main access to the site and the starting point of the projected visitor guidance system leading from the parking lot to the main gate in front of Complex 300.<sup>19</sup>

#### THE COLUMNS' PROJECT<sup>20</sup>

The Central Temple of the Great Enclosure, the so-called Temple 100, is a single-room peripteros with an additional prostylos row of columns (fig. 8). The eight central columns of the double row of columns at the temple front carry a unique decoration in raised relief. But all of these columns are in a bad to very bad state of preservation. Several bases and lower column drums have been protected *in situ* by brick encasings since the mid-1990s, while some other drums, as well as several minor fragments, were transferred to the on-site museum in the early



Fig. 14: The southwards extension of the protective wall towards the wadi east of the Great Enclosure (photo: Claudia Näser)

17 Cf. Kleinitz and Näser 2014: 21 for the planning of this measure.

18 In the course of this activity the unfinished westernmost repository, which had been largely buried under the removed *kom*, was liquidated, with its content being distributed among the three other deposits. Moreover, an isolated deposit south of the *kom* was dissolved and its content relocated to the three remaining deposits.

19 For a discussion of this route see Kleinitz and Näser 2014.

20 Team members involved in this project were Tobias Flacke (conservator, autumn season 2014), Fede Hamann (conservator, spring season 2015), Jan Hamann (conservator, spring season 2015), Claudia Näser (archaeologist), Sebastian Speiser (conservator, autumn season 2014) and Zarooq Bakri Mohamed (NCAM inspector).



Fig. 15: The customary parking lot south of the Great Enclosure with the area of the cleared *kom* visible as dark patches; the stone repositories to the left were rebuilt later (photo: Claudia Näser)

2000s.<sup>21</sup> This situation is unsatisfactory as it means that most columns are hidden from visitors, while their brick encasings obscure the sight of the temple. Even more importantly, the spatial organisation of the area as a columned hall – which arguably had been the focal point in the design and the perception of the Great Enclosure in antiquity – is not perceivable for present-day visitors. One of the main aims within the site management planning for the Great Enclosure is, therefore, to find a solution to re-exhibit the relief columns *in situ*. The ‘Columns’ Project’ thus comprises the conservation, consolidation, restoration and re-assembly of some or all relief columns in their original position as well as the complete rehabilitation of the area in front of the Central Temple.

A pilot phase for the conservational project component was launched in spring 2014 and continued in the current project year. In spring 2014 the base of column 8, which was still standing in its original position immediately north of the entrance to the Central Temple, had been treated as a trial piece to test and refine the conservation strategy.<sup>22</sup> In order to protect the piece during the ongoing treatment, it was temporarily removed to the on-site museum. In the autumn season 2014 its conservation was completed, the object was returned to its original position on the terrace and the lowest of the five column drums was successfully installed on top of it (fig. 16).

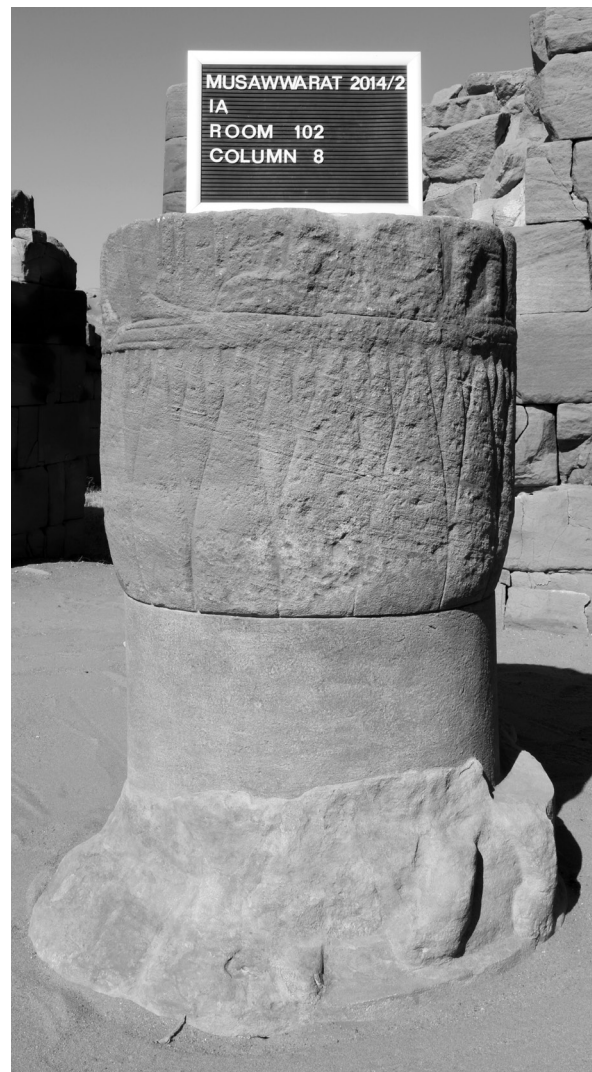


Fig. 16: The lower part of column 8 *in situ* after its conservation (photo: Claudia Näser)

21 Wolf and Pitterschatscher 1996; Wenig 2004: 13, fig. 4. Some of these columns had been 3D-scanned in 2009; Kleinitz, Bauer and Näser 2009: 42–44, figs. 18–20.

22 For the findings of this measure see Kleinitz and Näser 2014: 18–19.



Fig. 17: The columns in front of Temple 100 with their protective encasings temporarily removed during the conservation survey; note the restored column 8 in the rear row (photo: Claudia Näser)



Fig. 18: Crack in the reconstructed enclosure wall at the northeastern corner of the Great Enclosure (photo: Claudia Näser)



With the insights from column 8, a detailed condition assessment and work schedule for the treatment of the other seven columns, plus two additional columns of the outer peripteros circle, were prepared in the spring season 2015. This survey included an identification and detailed autopsy of all existing column fragments *in situ* (fig. 17), in the on-site museum and in the temporary stone repositories at the site. A detailed report of the findings and the resulting operational programme was drafted, and its implementation will continue with measures to consolidate the stone substance of the columns in autumn 2015. For the time being, all pieces on the Central Terrace, with the exception of the newly conserved parts of column 8, have once again been secured by protective brick encasings.

#### FURTHER REHABILITATION MEASURES IN THE NORTH AND THE EAST OF THE GREAT ENCLOSURE<sup>23</sup>

Reconstruction of the outer wall of the Great Enclosure started in 1997. In 1998 its northeastern corner (fig. 8: 227/N+E) was re-erected, and in the following year the rebuilding was continued towards south.<sup>24</sup> Recently, a crack had developed at the inadequately formed joint between the 1998 and 1999 segments (fig. 18), primarily due to the settlement of the 1998 portion. This settlement was in turn provoked by rain water accumulations and fluvial erosion brought about by the uncontrolled outlet of the drainage from the site museum. Two mitigation measures were implemented. First, the drainage of the museum was shifted into a new outlet channel (fig. 19) which runs into a newly built infiltration well north of the enclosure wall (fig. 20). This well has a diameter of 1.8m and a depth of c. 3m, and is filled with brick rubble, covered with a plastic sheet and a layer of earth. After the cause for the settling had thus been remedied, the enclosure wall around the crack was taken down and re-built with a deliberate expansion joint (figs. 19, 21).

Sand dunes which had accumulated at the outer enclosure walls (fig. 8: 224+225+226+227/N, 227/E, 337/N) were removed and the main eastern front of the monument (307+304+305/E) was cleaned. Large heaps of excavation rubble, stones and broken bricks from earlier conservation work, which had been deposited in a working area north of the Great Enclosure, were removed as a first measure

<sup>23</sup> Team members involved in these activities were Christiane Dorstewitz (archaeologist), Claudia Näser (archaeologist) and Zaroq Bakri Mohamed (NCAM inspector).

<sup>24</sup> Wenig 1999: 20–23, 2000: 11–12, figs. 1–2.



Fig. 19: Construction of the new outlet channel for the drainage of the site museum; note the re-modeled, though still unplastered area of the crack in the enclosure wall in the rear (photo: Claudia Näser)

in the rehabilitation of this part of the site (fig. 21), which will be continued in connection with the construction of the fence in the coming project year. The material from these clearings was also used in the extension of the platform southeast of the Great Enclosure (cf. above p. 15).

#### LIME MORTAR CAPPINGS

Another longterm conservation project – equally started in 1997<sup>25</sup> – is concerned with protecting the building substance of the Great Enclosure from further deterioration. The walls of the Great Enclosure are built as two-shell constructions of sandstone masonry, with a core of sandstone rubble embedded in earth mortar, capped with specifically formed sandstone blocks, the so-called donkey backs. Almost all of the walls of the Great Enclosure – altogether about 5km in length – have lost these original cappings and are now open to intruding

<sup>25</sup> Wenig 1999: 19–20, 2001: 17–18.



Fig. 20: Construction of the infiltration well outside the enclosure wall (photo: Claudia Näser)



Fig. 21: The northeastern corner of the Great Enclosure after the completion of the measure (photo: Claudia Näser)



Fig. 22: Covering open wall tops with a lime mortar capping in Complex 500; in the centre and the background walls after treatment (photo: Claudia Näser)

rain water which erodes the earth mortar of their filling and as a consequence also destabilises the outer masonry shells. An effective measure against their deterioration and eventual collapse has been found by sealing the open wall tops with a layer of lime mortar (fig. 22). The technique of this application has been developed and advanced over nearly two decades, meeting all standards required for such measures. The mortar covers are applied without a physical intervention into the existing structure of the walls. They are clearly differentiated from the ancient substance and completely reversible. Coloured in a sandy tone matching the surrounding sandstone building material they avoid any visual intrusion into the overall appearance of the site.

In spring 2015, lime mortar capping concentrated on Complexes 200 and 500 of the Great Enclosure i.e. the buildings and courtyards surrounding Temple 200 and north of the Central Terrace (figs. 8, 22). Altogether, 190m of walls received a cover. Photographs were taken of all walls prior to their treatment in order to facilitate condition assessments and future monitoring.

Upon inspecting walls which had been treated in previous years, conspicuous changes in the appearance of block surfaces with a progressing disintegration of the stone substance, primarily in block

courses close to the ground and immediately underneath the mortar cappings, and most distinct in walls facing west, were noted.<sup>26</sup> The working hypothesis is that these changes derive from moisture ‘trapped’ in the walls under the cappings, primarily in those wall portions where evaporation is low due to a reduced exposure to wind and sun. That these symptoms appeared only now might be due to higher precipitation in the last few rainy seasons. This observation needs to be followed up with detailed analyses, and the overall conservation strategy will need to be assessed and potentially adjusted to the findings and ongoing monitoring.

#### THE MUSAWWARAT COMMUNITY ARCHAEOLOGY PROJECT<sup>27</sup>

Despite the fact that the consultation of the residents of heritage sites and their participation in planning processes are increasingly recognised as important parts in the development of sustainable site manage-

<sup>26</sup> Kleinitz, verb. comm., March 2015.

<sup>27</sup> The team members currently involved in this project are Claudia Näser (archaeologist, director), Kurt Beck (social anthropologist), al-Fatih Mohamed Ali (social anthropologist) and Christiane Dorstewitz (archaeologist).



Fig. 23: Kurt Beck, Mustafa Mohamed Ahmed al-Dali and Sheikh Mohamed Ahmed al-Dali at the Bir ban Naga (photo: Claudia Näser)

ment plans,<sup>28</sup> actual practice still has a long way to go in this respect. In order to tackle the subject, a multi-faceted community archaeology project was launched in Musawwarat in spring 2015. Its main task is to provide the foundations for sustained communication between the members of the archaeological mission and other stakeholders of the archaeological project and the manifold groups and individuals of the communities living in the valley of Musawwarat and its surroundings. Springing from that, the project aims at collectively developing visions towards the sustainable management and development of the site which embraces the communities' needs and hopes for their future at Musawwarat.

The initiative of engaging members of the local communities in processes of cultural resource management is breaking new ground in our operational environment. We have therefore defined three areas which will enable us to find common ground. First, the community project aims at exploring the history and current practices of archaeological work, and the generation of archaeological knowledge at Musawwarat particularly from the point of view of the involved (and uninvolved) members of the local communities. Second, archaeological research

will be expanded into sites and topics which particularly matter to the local communities, such as Bir ban Naga, the well which served the residents of Musawwarat as the main source of water before the construction of the new well outside the Wadi es-Sufra in the late 1990s. And third, members of the project actively enquire into the aspirations of the local residents with regard to the development and management of the Musawwarat archaeological heritage site.

Within three pilot periods of fieldwork in spring and summer 2015, project members new to Musawwarat introduced themselves to members of the communities and started to explore a wide range of relevant topics. Kurt Beck studied the work at the site (fig. 13) and conducted interviews with individual workmen. He and the two archaeologists of the project visited Bir ban Naga together with Sheikh Mohamed Ahmed al-Dali and his son Mustafa Mohamed Ahmed al-Dali and started to contextualise (hi)stories of the construction and use of this well with material remains and spatial data on the ground (fig. 23). Al-Fatih Mohamed Ali and Claudia Näser collected data on the individual camp sites, *furgan*, and their inhabitants in the valley of Musawwarat and its surroundings.

A special event was the public screening of four documentaries which DEFA, the GDR film com-

28 See e.g. UNESCO 2013 and the contributions in Makuva 2014 and Van Balen and Vandesande 2015.





Fig. 24: Public screening of four DEFA documentaries about the archaeological work in Musawwarat in the 1960s (photo: Claudia Näser)

pany, had shot during the archaeological project in Musawwarat in the 1960s.<sup>29</sup> The presentation was organised in the dig house, where a movie screen had been painted onto one of the house walls (figs. 24–25). The event, which was attended by about 50 members of the local community and all of the archaeological team, was preceded by public speeches and the advertisement of the community archaeology project. One immediate reaction to the presentation was the wish expressed by many of the viewers to obtain images of the people shown in the films to contemplate them and discuss them in more leisure. This request was followed with a series of images being taken to Musawwarat and discussed with members of the work crew in August 2015.

Another informal community gathering was held apropos the end-of-season farewell dinner in April 2015. This occasion was used to sum up issues which had been raised during the first periods of fieldwork in the community project up to this point. In many encounters, the development of the heritage site and the aspirations of local residents for their future in

Musawwarat had been overarching topics and community members had consistently put forward three points in this regard, namely local access to school education, water and health care. Among these, the local access to schooling had been emphasised as a prime concern by many interview partners, while wider discussions also showed that this interest was not shared by all members of the community. Currently, schooling is only available “at the Nile” i.e. in the villages near the river where the families have to move to in order to send their children to school. The result of this is that not all children attend school or do not attend all the time or through major parts of the curriculum. While some of the residents would very much welcome a local school in Musawwarat, which would relieve families of the necessity to move to the Nile valley and could bring about many advantages for children and parents alike, others asked the mission to support the establishment of a school attended by children from Musawwarat in the Nile valley. The farewell dinner was used to discuss these points as well as possible future scenarios and the role which the community and its representatives will have to play in pursuing any of them. All in all, the community archaeology project has already gathered considerable pace. The first cycle of fieldwork has stimulated discussion and raised awareness of the pressing issues, questions and aspirations among all

<sup>29</sup> “Brunnen”, “Im Wüstencamp”, “Musawwarat”, “Notiert im Sudan”, directed by Götz Oelschlägel, DEFA 1966. Copies of these films and permission to use them in the current research were kindly granted by Deutsche Kinemathek, Bundesarchiv-Filmarchiv and PROGRESS Filmverleih GmbH.



Fig. 25: Watching the films (photo: Claudia Näser)

involved parties and individuals, thus laying good foundations for future action and research.

#### OUTLOOK

The second year of the QSAP-funded project at Musawwarat saw major measures in the realm of site management, conservation and community cooperation advanced or completed. The largest individual measure was certainly the renewal of the Lion Temple roof – which had been targeted for the last twenty years and could now be implemented in a concisely planned ten-month project. The implementation of a core visitor guidance system through the Great Enclosure was advanced with the redesign of the central access zone to the monument as well as the rehabilitation of its southeastern periphery and restoration measures at its most visited spot, the Central Terrace with the columns equipping the entrance area of Temple 100. Further work related to the building substance of the site museum and rehabilitation measures at the perimeters of the site's two main monuments, the Great Enclosure and the Lion Temple. The community archaeology project was initiated and has raised seminal topics regarding the site's future. In addition, quantitative data have been collected which will support management planning. Two project components, which on the one hand look at the history and practice of archaeological work and knowledge generation at the site from the perspective of the local workmen and on the other hand widen archaeological investigation into sites and topics which particularly matter to the local communities, are hoped to help open new avenues of

communication and understanding for all concerned parties.

Alongside the concrete measures realised on the ground, planning continued with regard to long, medium and short term objectives. The continued efforts to establish benchmark data for physical restoration, as undertaken in the projects related to the Lion Temple, the columns on the Central Terrace and the lime mortar cappings in the Great Enclosure, provide a basis for defining a schedule of planned measures on the basis of realistically calculated resources necessary and available to actually implement these measures. The

same goes for measures related to the rehabilitation, conservation and redesign of individual areas of the site and the establishment of a core visitor guidance system. Against this background, activities in the upcoming project year will focus on the completion of the work in and around the southeastern corner of the Great Enclosure (courtyard 415), the conservation and rehabilitation of the Great Enclosure's ancient main entrance (fig. 8: 305-E), and the continuation of the Lion temple and the Columns' Project. A major project will be the construction of the fence around the Great, Small and Smallest Enclosure.<sup>30</sup> Planning will move towards the rehabilitation of the rainwater drainage of the Central Terrace which will be a prerequisite for the effective conservation of this seminal part of the site's main monument. Simultaneously, planning of tourist facilities i.e. information panels, benches and structures providing shade will continue. The presentation of the site will work from the experiences collected in the tourist study,<sup>31</sup> the community archaeology study and the continued development of the website [www.musawwarat.com](http://www.musawwarat.com).

All in all, site management planning at Musawwarat will continue to follow the incremental and integrative approach outlined in the present contribution. The close intertwining of planning and implementation allows experiences and results from ongoing and completed measures to directly enter into the next steps of the planning process. This recoupling is the basis for maintaining the tight schedule of planning, execution planning, imple-

30 Cf. Kleinitz and Näser 2014: 21 for the background of this measure.

31 Kleinitz and Näser 2014: 12–13.



mentation and evaluation which helps to optimise the use of the available resources, and possibly the unique chances, within the restricted time frame of the QSAP funding.

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#### ZUSAMMENFASSUNG

Der Beitrag berichtet von den Arbeiten im Bereich Site Management im zweiten durch das Qatar Sudan Archaeological Project geförderten Projektjahr 2014/15 in Musawwarat es-Sufra. Im Einzelnen werden folgende Maßnahmen vorgestellt:

- Umgestaltung der Wegführung zwischen Großer Anlage und Löwentempel
- Erneuerung des Dachs des Löwentempels und flankierende Maßnahmen wie Fundamentuntersuchungen und Umfeldgestaltung
- Fortsetzung der Neugestaltung des südlichen (Außen)bereichs der Großen Anlage als eine zentrale Komponente im Aufbau eines Besucherleitsystems: archäologische Untersuchung der Mauer 415/E+S in elf Grabungsschnitten; Erfassung eines bisher unbekanntes Tors, 415-E, in die Große Anlage; Auffindung der antiken Südostecke der Großen Anlage, deren Erhaltung bisher bezweifelt worden war; Beginn der Rekonstruktion der Mauer 415/E; komplette Beräumung der Ostseite des Hofes 415 und des Areals südlich von Hof 415 von Grabungsschutt der 1960er Jahre; Rekonstruktion der Steindeposite in diesem Bereich
- Verwendung des abtransportierten Grabungsschutts zur Erweiterung der Schutzkonstruktion östlich der Großen Anlage: Blockierung der östlichsten Abflussrinne des Wadi es-Sufra; Verlä-



- gerung der 2013/14 dort angelegten Schutzmauer als Abraumwall um ca. 40 m nach Süden bis zur neuen Piste zum Löwentempel
- Fortsetzung des Projekts zur Konservierung der Reliefsäulen vor Tempel 100 auf der Zentralterasse der Großen Anlage; Fertigstellung der Pilotstudie in Form der Konservierung der Basis von Säule 8; Zustandskartierung und Ausführungsplanung für die anderen sieben Reliefsäulen sowie zwei weitere Säulen des äußeren Säulenkranzes von Tempel 100 mit einer detaillierten Dokumentation aller Säulenreste *in situ*, im Site-Museum und in Steindepositen auf dem Fundplatz
  - Behebung eines Risses an der Nordostecke der rekonstruierten Außenmauer der Großen Anlage; Neugestaltung der Wasserableitung des Site-Museums zur Behebung der Rissursache mit Errichtung einer Rigole nördlich der Großen Anlage
  - Beginn der Rehabilitierung des nördlichen Außenbereichs der Großen Anlage durch die großflächige Beräumung von Sand und Grabungsschutt
  - Fortsetzung der Kalkmörtelabdeckungen in den Komplexen 200 und 500 der Großen Anlage mit ca. 190 m neu abgedeckten Mauern; Planung von Analysen als Reaktion auf möglicherweise vermehrt auftretende Schadensbilder an Blockoberflächen, die eine Folge der Kalkmörtelabdeckungen sein könnten
  - Beginn eines Community Archaeology-Projekts mit mehreren Komponenten, im Einzelnen: eine Studie zur Geschichte und Praxis archäologischer Arbeit und zur Generierung von Wissen in Musawwarat mit dem Fokus auf der Rolle der lokalen Arbeiter in diesen Prozessen – eine Diskussionsvorlage dafür war die öffentliche Vorführung von vier DEFA-Dokumentarfilmen zu den archäologischen Arbeiten der 1960er Jahre und die Arbeit mit Bildmaterial aus diesen Unternehmungen; Erweiterung der archäologischen Forschung auf Orte und Themen, die für die lokale Gemeinschaft von besonderem Interesse sind, begonnen mit einer Pilotstudie zum Birban Naga, dem historischen Brunnen im Wadi es-Sufra; Einbindung der lokalen Gemeinschaft in die Diskussionen zur perspektivischen Entwicklung des Fundplatzes; als besonders relevant wurde in vielen Gesprächen der lokale Zugang zu Schulbildung herausgestellt; in Reaktion darauf wurde die Möglichkeit der Gründung einer Schule vor Ort eruiert und von dem Community Archaeology-Projekt unter anderem durch die Erhebung quantitativer Daten zur Bevölkerungsstruktur unterstützt.

In einer übergeordneten Perspektive diskutiert der Beitrag den für Musawwarat eingeschlagenen Weg einer integrierten stufenweisen Entwicklung eines umfassenden Site Management Plans. Dabei erstreckt sich die Planung über einen mittelfristigen Zeitraum, parallel zur Umsetzung der ersten Maßnahmen. Die daraus entstehende Rückkopplung erlaubt es, die Ergebnisse und Evaluierungen durchgeführter Maßnahmen direkt in die Planung einfließen zu lassen und diese damit sehr präzise und konkret zu halten. Dadurch wird zum Einen ein zügiger Ablauf von Konzeption, Ausführungsplanung, Durchführung und Evaluierung einer Maßnahme ermöglicht; darüberhinaus verhindert diese Strategie ein Auseinanderdriften von Planungsprozess und tatsächlicher Ausführung, also das häufige Szenario unrealistischer Planungen, denen konkrete Maßnahmen hinterherhinken oder letzten Endes sogar unausgeführt bleiben. Das wichtigste Einzelprojekt des aktuellen Projektjahrs, die Erneuerung des Löwentempeldachs, die von den ersten Planungsschritten bis zum erfolgreichen Abschluss der Maßnahme lediglich zehn Monate in Anspruch nahm, ist ein beredtes Zeugnis für den Erfolg dieser Strategie. Ihr folgend, werden die für die nächsten Projektzeiträume anvisierten Planungsschritte und Maßnahmen im Kontext der aktuellen Ergebnisse als Ausblick diskutiert.