A new protective shelter for the
Royal Baths at Meroë (Sudan)
In Meroë, the capital of the Kingdom of Kush in the middle Nile valley, an extraordinary hydraulic facility was built directly next to the royal palaces: the so-called Royal Baths. Dating from around the turn of the first millennium, the complex of buildings is an outstanding example of cultural transfer between the African kingdom and the Hellenistic-Roman cultures of the Mediterranean.

The central feature of the complex is a large basin with an elaborately decorated wall. The water entered the basin through several pipe openings in this wall, cascading down against a backdrop of sculpted figures, green-blue shimmering faience and colourful wall paintings.

The unique ensemble will now be better protected by the new shelter and presented to visitors in a way that reflects its cultural and historical importance.
The so-called Royal Baths were discovered in 1912 by John Garstang of the University of Liverpool in the course of the first excavations at Meroë. The ancient city lies on the east bank of the Nile some 200 km north of the confluence of the White and the Blue Nile near the Sudanese capital Khartoum (Fig. 3, see also Fig. 20). Meroë developed over the centuries to become the residential city of the Kushite kings. For more than 1,000 years from around 900 BC to the early 4th century AD, this kingdom ruled the middle Nile valley, from Egypt’s southern frontier near Aswan into the interior of Africa. The kingdom’s previous capital lay on the 4th cataract at Napata, which was endowed with temples to the chief gods, palaces and royal cemeteries. In the early 3rd century AD, Meroë, which lay further to the south in the Kushite heartland, grew in importance. From that time on, the queens, kings and princes were buried there in the cemeteries with the famous small, steep-walled pyramids (Fig. 4), a clear sign of Meroë’s new role as the central city of the kingdom.

The residential district of Meroë, the Royal City, is enclosed by a thick wall (Fig. 5). Beyond the city gate lies the temple of the chief god Amun, approached from the east by a processional way. Within the city wall are smaller sacred buildings along with two royal palaces and spacious residences. Directly adjacent to the palaces is the conspicuously large precinct of the Royal Baths. Sited on an enclosed, peripheral strip of land between the palaces and the city wall, the complex occupies a prominent but rather secluded location in the Royal City. Centuries after the palaces and the city wall were built, this strip of land, until then hardly used, was levelled and completely re-fashioned with the construction of the Royal Baths.
The architectural design of the Royal Baths (Fig. 6) has no known parallel in the Kingdom of Kush. The centrepiece of the 30 m x 50 m complex is the virtually square water basin with an area of 7 m x 7 m and a depth of 2.4 m (Fig. 1). Shallow steps lead down into the basin (Fig. 7). It was surrounded on three sides by an ambulatory flanked by columns. On the fourth, south-facing side is the water inlet system concealed by a tall decorated wall. A few metres to the north of it an exedra was built with four ceremonial chairs arranged in a quarter-circle (Fig. 8).

The basin and the exedra, the principal elements of the complex, were surrounded by a garden. There is evidence that this levelled area was flooded with fertile river mud and that plant pits were dug regularly around the basin. The garden was enclosed by corridors and adjoining rooms.

Water was conducted to the basin from the south via open channels. Narrow, surface channels also ran through the garden to the exedra and to the edges of the basin. The point of origin and hence the source of the water for the supply system is still unclear. It can be assumed, however, that a device existed to lift water to the necessary height above the groundwater table or the level of the Nile.
The principal supply of water to the basin was ensured, from the south, by a burnt-brick construction with an open water channel (Fig. 9). The channel is plastered with waterproof lime render which was reapplied twice during the working life of the Royal Baths. This principal inlet channel, on reaching the basin, splits into several branches whose water is conducted via covered pipes through the richly decorated show-wall to the rim of the basin (Fig. 12). From there the water gushed, possibly through spouts, into the basin, which was likewise completely plastered with waterproof lime render.

As a special attraction a column may be imagined in the centre of the basin (Fig. 10). Water was drawn up through an integrated pressure pipe in the column drums and flowed from the top back down into the basin.

The basin was drained by means of a massive underground channel that conducted the water westwards to the Nile (Fig. 6 and 11). In an impressive feat of engineering, the drain was laid at a depth of about three metres and passed under the foundations of the centuries-old city wall, which was approx. 5 m thick. On the floor of the very well preserved channel is a collared clay pipe 20 cm in diameter, laid in lime mortar. The channel’s side walls are formed of solid sandstone blocks upon which lay an elaborate brickwork cover. The imprint of logs testifies to an additional layer covering the construction.
Several water pipes are built into the elaborately decorated south wall of the basin (Fig. 1, 12–17). Water gushed into the basin against a colourful backdrop of wall paintings, faïences and small sculptures. The decor, like the architectural design of the Royal Baths, is without parallel in the Kingdom of Kush.

Here several different cultural traditions, foreign and indigenous, merged to form a unique iconography – striking testimony of the Meroitic elite’s contacts with and receptivity towards its northern neighbours around the turn of the first millennium.

The iconography for instance includes the genuinely Meroitic god Apedemak, represented as a lion with crown standing on a sickle moon (Fig. 14). In combination with water the native god was worshipped as a guarantor of fertility.

Along with this Egyptian motifs are also shown, such as the sa knot (Fig. 15) and the ankh sign (Fig. 16). These reflect the Kushite kingdom’s traditionally very close historical and cultural ties with ancient Egypt, and symbolize protection and life.

In contrast the pan pipes are rooted in Graeco-Roman culture (Fig. 12 and 17). They are associated with the retinue of the Greek wine god Dionysus. The foreign instrument will have reached Meroë in the middle Nile valley and entered the cultural sphere of the Kushite ruling dynasty via Egypt, where it had
become popular in the 3rd century BC during the reign of the Ptolemies when the new potentates accentuated the Dionysus cult as part of their religious policy.

The manner of representing the human form likewise betrays the influence of the Mediterranean world. What is particularly noteworthy about the statue of a poet or philosopher (Fig. 18 a–c), made at Meroë, is how lifelike it is. The representation is not characterized by frontality and formalism: instead we see a rather corpulent figure with an inner dynamism sitting casually on a stool.

What could the decor in the Royal Baths complex mean? The imagery of water and wine, music and dance in a garden-like setting and under the protection of deities is evocative of prosperity, abundance and well-being. Whether cultic rituals or profane actions in the context of the Meroitic royal family took place here cannot be established for lack of comparisons. But the inspiration for an ensemble that is contemporary and at the same time preserves local traditions will have originated from the neighbouring dynasties, the Ptolemies in Egypt and the Hasmoneans in Palestine.

The Royal Baths issue from a context characterized by relations with the outside world and openness to the new: Egyptian and Graeco-Roman forms and ideas are received in an African civilization and modified in combination with local traditions around the time of Christ’s birth. This represents unique evidence of cultural transfer between Africa and the Mediterranean in antiquity.
John Garstang recognized the need to protect the fragile remains of the Royal Baths from weathering in 1912/13. A short time later Herbert Kitchener, head of the British colonial administration in Egypt and Sudan, initiated the building of a basic shelter for the decorated wall. This first protective structure was replaced in the mid 20th century by two separate brick buildings covering the water basin and the exedra (Fig. 21). After more than half a century these two protective structures, because of design defects, now increasingly pose a threat to the ancient fabric.

For this reason a new protective shelter is to be built over the core area of the Royal Baths to ensure the best possible protection of the archaeological remains and also to present them to visitors appropriately and conveniently under one roof. This project is among efforts being undertaken to safeguard world heritage at Meroë and preserve it for future generations.

1909 – 1914 Excavation of the Royal City of Meroë and the surrounding temple complexes by archaeologist John Garstang, University of Liverpool (Fig. 19)

1912 Discovery of an unusual building complex with water basin in the vicinity of the palaces of Meroë. The complex is named the Royal Baths. In subsequent years, partial excavation of the building and publication of preliminary reports, photographs and plan.

1999 Resumption of field work and start of conservation work in and around the Royal Baths by the German Archaeological Institute (DAI) in Berlin in cooperation with the National Corporation for Antiquities and Museums (NCAM) in Khartoum

2011 The Meroë region and two other sites in the Meroitic heartland – Musawwarat es Sufera and Naga – are inscribed on the UNESCO world heritage list as „The Archaeological Sites of the Island of Meroë“ (Fig. 20).
The new shelter was designed by the Berlin architect’s office Kéré Architecture. The designs impressed the jury for the clear and tranquil concept of a discrete and self-contained building that at the same time respects the ancient site. In its overall conception the shelter will integrate harmoniously with the archaeological world heritage site of Meroë.

Traditional building techniques and practices in conjunction with innovative technological solutions make it possible to build and operate the shelter using locally available resources. A naturally regulated indoor climate, natural lighting and suspended walkways ensure the best possible protection and presentation of the antiquities, enhancing the visitor experience offered by the site.

A precondition for the erection of a new protective structure over the Royal Baths is the safeguarding of the ancient fabric. The architectural remains essentially consist of a brick construction whose walls and channels are extensively plastered with lime render and colourfully painted. In many places several layers of plaster are preserved, indicating repeated renovation work as a result of intensive use. Likewise the sculptures made of local sandstone have a coat of fine plaster and are colourfully painted.

Therefore, since the joint project between the DAI and the NCAM began in 1999, the archaeological investigations have been accompanied by regular conservation efforts by restorers from Berlin and Khartoum. These activities centre on the stabilization of the masonry bond and very fragile sandstone and above all on the layers of plaster and paint. These have to be cleaned, any gaps between the brickwork and the rendering have to be filled, defects have to be remedied and finally plasterwork edges have to be bonded to the ground once again.

The conservation programme is already far advanced. While the new protective shelter is under construction, the decorative wall, exedra and sculptures will be protected by temporary structures.
The guiding principles

Protection of the site
The foundation combines strip and point footings depending on the archaeological situation. The internal structures and visitor walkways are suspended from the roof girders, allowing minimal interference with the site. (Fig. 26, 34)

Simple construction
The building is designed mainly to be built with material available on the local market and with the help of unskilled workmen. The use of heavy equipment is not required. (Fig. 35, 36)

Natural climate concept
A solid outer wall of mud-bricks, the clam-shell roof construction, the zoning of the interior and natural convection allow for natural air conditioning. (Fig. 25, 27, 37, 38)

Natural lighting
Daylight enters the interior through translucent panels and covering and is dispersed by reflectors under the roof girders. This guarantees constantly low-intensity, indirect natural lighting. (Fig. 28, 37, 38)

Optimal presentation
The simple shape of the building maintains the authenticity of the site. Visitors will have an optimal view of the architecture and facilities of the Royal Baths and a small exhibition.

Fig. 24: Axonometric projection, view from north
The design concept

The building is continuously ventilated without using elaborate technology that requires servicing, but instead exploiting convection. Solid mud-brick walls, the clam-shell roof construction, and the gardens as buffer zones allow for an inert temperature and humidity control. Using convection, fresh air enters through aeration slits above floor level into the garden areas inside the building. The gardens act as climate buffers, cooling the air. Additionally, dust can settle here before reaching the excavation sections. In the hotter roof section, the wind causes a suction effect, drawing the warm air up from the interior out of the building. As a result, fresh air is drawn into the ground-level area.

Lighting will be provided by daylight entering the interior through the roof construction and the gardens. The roof girders carry translucent semi-cylindrical panels through which light can pass. Underneath these are white plastered panels which diffuse the daylight evenly throughout the interior, preventing damage to the ancient wall paintings.

The shelter

The interior under the shelter will be divided into excavation sections, garden areas and a small functional segment. The gardens are a reminiscence of the ancient garden around the water basin and the exedra. Additionally, the two garden areas serve as climate buffers, reduce the entry of dust, provide extra light for the interior and may be used as relaxation areas.

The primary support structure of the building consists of solid mud-brick walls and roof girders of steel. All interior structures including the visitor walkways are suspended from the roof girders. Additionally, the walkways are fixed to the ring beam. This allows flexible positioning without interfering with the archaeological remains and gives visitors an optimal view of the archaeological remains. The exhibition includes finds from the ancient decor as well as information panels.

Lighting will be provided by daylight entering the interior through the roof construction and the gardens. The roof girders carry translucent semi-cylindrical panels through which light can pass. Underneath these are white plastered panels which diffuse the daylight evenly throughout the interior, preventing damage to the ancient wall paintings.
The shelter

Fig. 29: Elevation from west

Fig. 30: Longitudinal section

Fig. 31: Elevation from south

Fig. 32: Transverse section

The design

Fig. 33: Plan of the protective shelter
The outer walls are 60 cm thick, built of mud bricks and plastered. They are surmounted by a second ring beam that supports the roof girders. The parapet is formed of Z-shaped concrete struts which allow ventilation from all directions.

The roof construction has two layers. Between the girders, vaults made of burnt brick form the ceiling. On top of the vaults a second roof of trapezoid sheeting is installed forming a clam-shell for cooling. The upper surface of the roof is made of translucent semi-cylindrical panels through which light enters into the exhibition area.
The construction

Fig. 38: Cross section with construction details

Abb. 39: Visualization of the new protective shelter, interior view of the basin

Illustration credits
DAI, Project Meroë Royal Baths: Fig. 1, 10, 14, 15 (P. Grunwald); Fig. 2, 23–39 und cover picture (Kéré Architecture, Berlin); Fig. 3 (E. Richter, on basis of http://www.isaw.nyu.edu/exhibitions/nubia/images/nubia-map-lrg.png); Fig. 5, 6 (E. Richter, on basis of publication J. Garstang und Data MRB-Project); Fig. 7–9, 11, 12, 16–18 (H.-U. Onasch); Fig. 13 (drawing J. Ley); Fig. 20 (E. Richter, on basis of googlemaps); Fig. 21 (F. Stremke); Fig. 22 (S. Wolf) — Anette Schulz, Rütt + Schulz Restaurierung GbR, Berlin; Fig. 4 — Courtesy of the Garstang Museum of Archaeology, The University of Liverpool, neg. JG/M/L/20: Fig. 19.