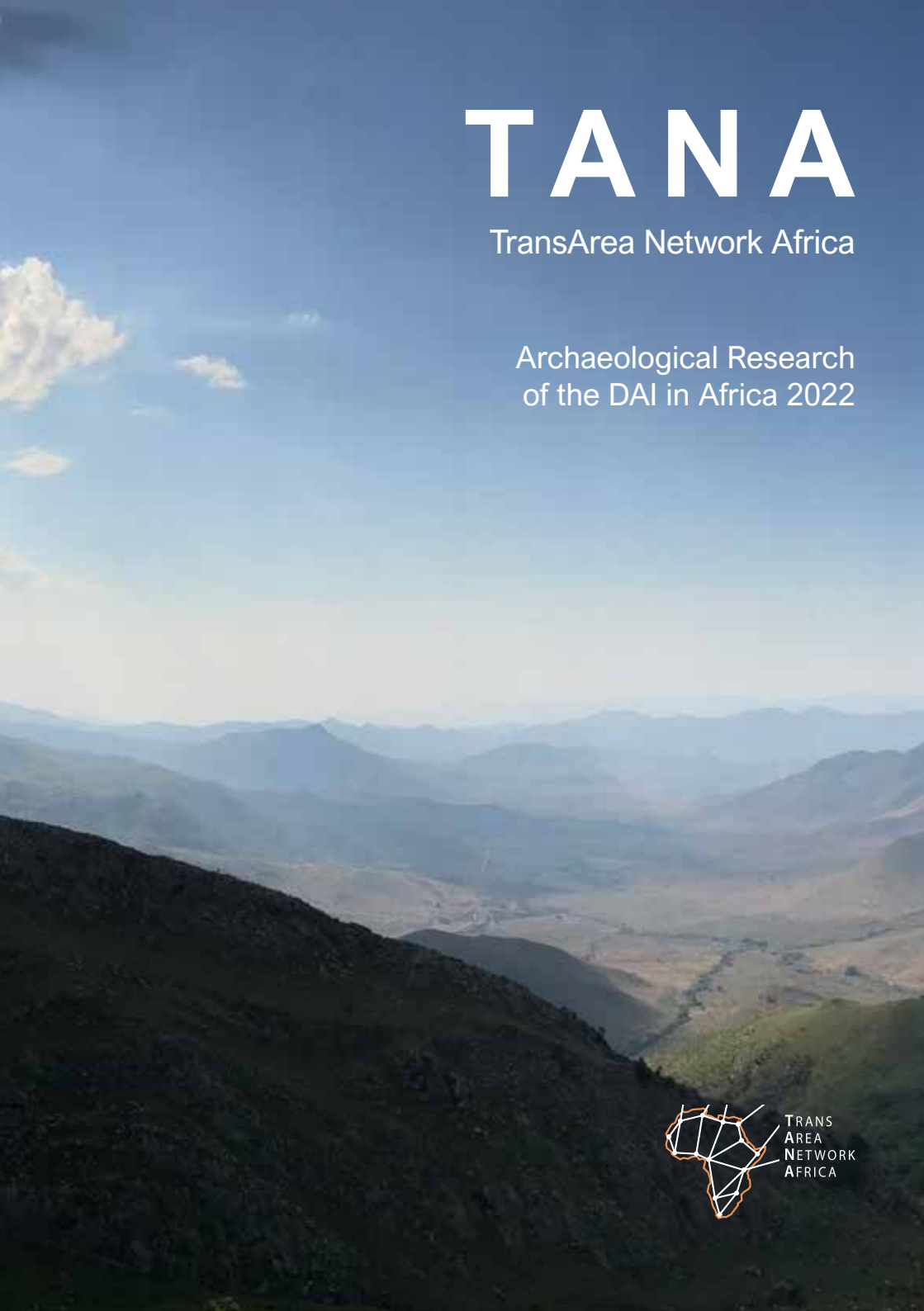

TANA

TransArea Network Africa

Archaeological Research
of the DAI in Africa 2022

TRANS
AREA
NETWORK
AFRICA

TANA

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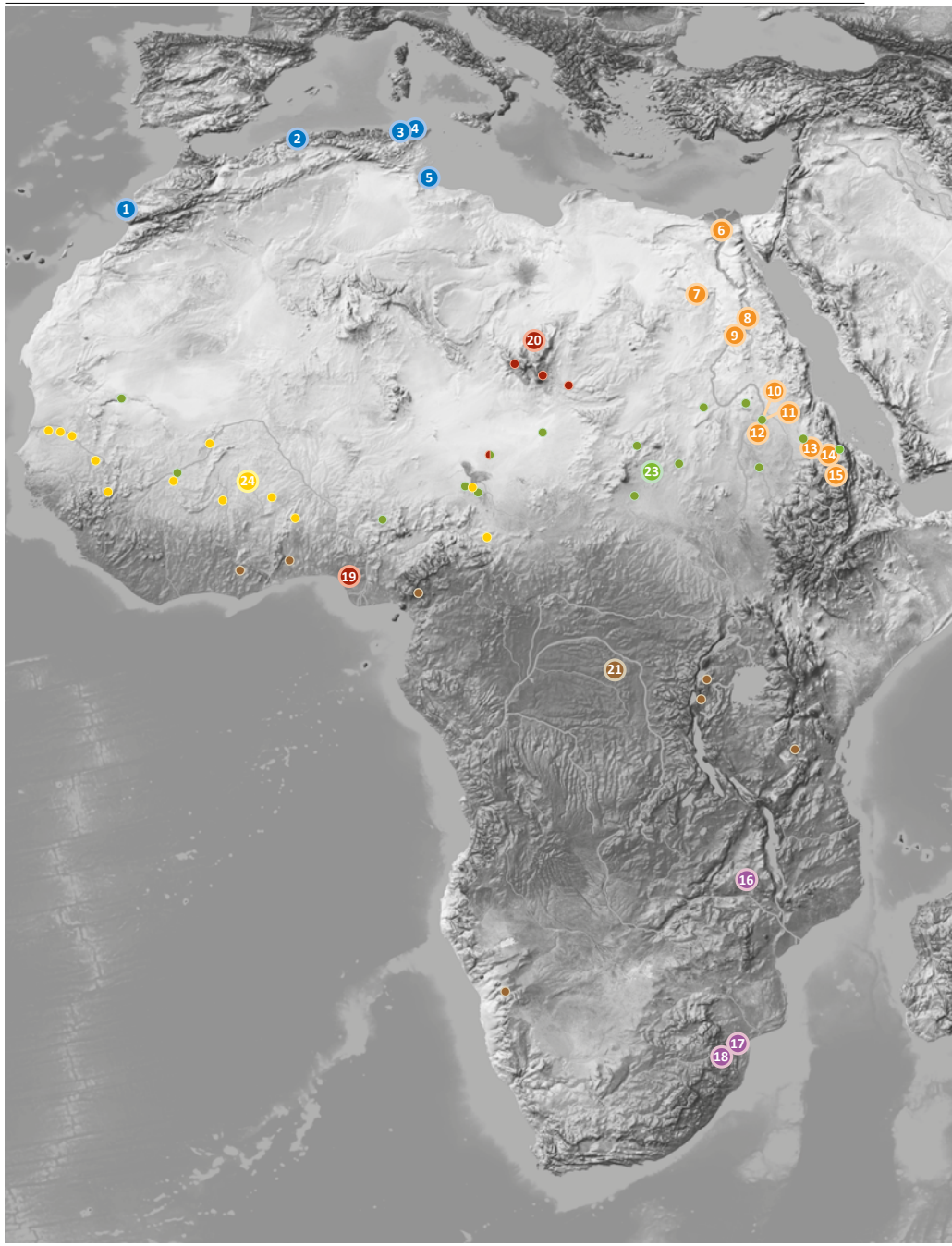
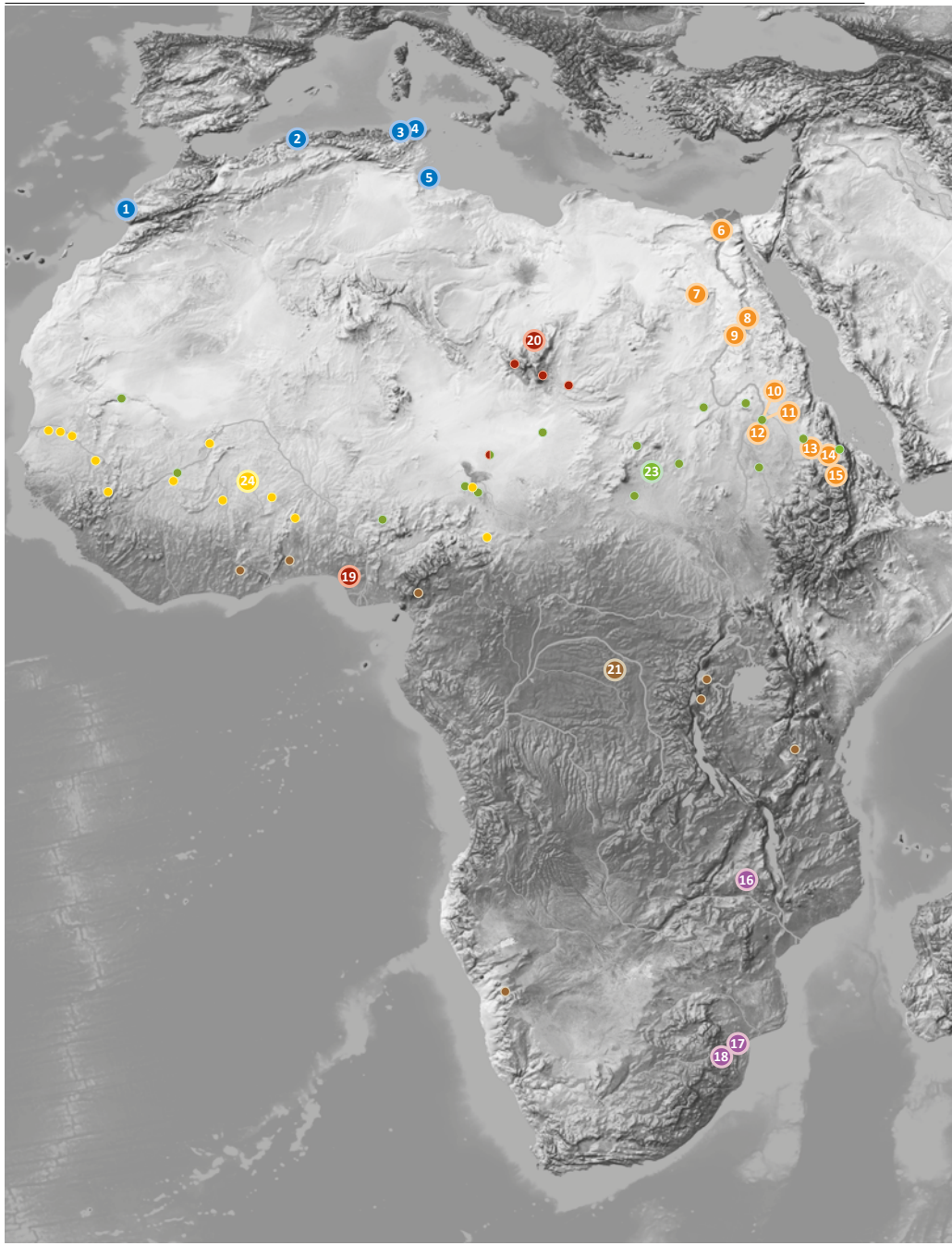




Foreword

Dear friends and colleagues,

In your hands you hold the second edition of our TANA booklet. It has been four years since we first published a compilation of DAI Africa projects in the first edition. In that year, 2018, our TransArea Network Africa just looked back on a history of four years. Now, in 2022, we are already facing eight years of joint exchange in our network, a series of instructive meetings, exciting field trips and important publications. A good opportunity to present a revised version of this booklet. Besides some well-known projects, you will find numerous new activities. A good mixture as we think.

Have fun reading,

Warm regards,
The TANA Team

What is TANA?


An overview of the site
Frederiksgave
Maps
Common
Heritage Pr

What is TANA? – Structure and goals

JÖRG LINSTÄDTER / PHILIPP VON RUMMEL

The African continent offers unique archives for the study of the human development and all subsequent epochs of human history. For this reason, the German Archaeological Institute (DAI) has been involved in Africa for decades, represented by various commissions and departments. Unlike other geographical research focuses of the DAI, which are mainly organized and managed by offices abroad, such as Rome, Athens and Istanbul, as well as Tehran and even Beijing, the DAI, with the exception of the Cairo department in the far north-east of the continent, does not have an office in Africa. Therefore, the TransArea Network Africa (TANA) was founded in 2014 to coordinate the numerous projects of the various working units and to present them to the outside world.

On the one hand, TANA aims to better network the projects of the DAI with each other and with its African and worldwide partners in order to further strengthen African archaeology in research and heritage management. On the other hand, TANA also wants to have an

TANA members visiting the slave quarters at "Frederiksgave", which were reconstructed on the basis of archaeological excavations and illustrate the poor living conditions of those who were exploited at the plantation (Photo: L. Ehlers)

TANA's 8th annual meeting was held in collaboration with the School of Arts at the University of Ghana. The first day of the conference was concluded with a tour of the university's Museum of Archaeology, which holds numerous objects from the colonial period that were recovered during the Department of Archaeology and Heritage Studies' excavations (Photo: L. Ehlers)

impact back on Germany in order to further promote the relevance of Africa in the German research landscape and, as a research platform, to consolidate and expand existing cooperation with universities and other actors in the German academic system. Globalization poses a challenge to the sciences and established narratives, especially with regard to the African continent. Exchange, interaction, interconnectedness and networks more similar to our world today also characterized past times more strongly than is represented by the current scientific discourse. Therefore, TANA also wants to contribute to opening the general awareness for diversity and multi-perspectives of historical interweaving processes and to overcome existing disciplinary and territorial state boundaries. Currently involved in the network are the Commission for Archaeology of Non-European Cultures in Bonn, the Cairo, Rome and Madrid Departments, the Orient Department, the Berlin Head Office with the Department for Cultural Heritage Protection and Site Management, the IT Department, the Architecture Department, the Natural Sciences Department, the Friedrich Hinkel Research Centre and their partners, mainly from African countries but also from other European and worldwide institutions.

Within Germany, TANA benefits from the DAI's membership in the Forum Transregional Studies Berlin as well as the involvement of its members in various clusters of excellence, priority programs and collaborative research centers funded by the German Research Foundation (DFG). At regular meetings of the network, overarching questions of African archaeology are discussed with partners of the mostly multilaterally structured projects. Jointly developed questions make it possible to combine projects from scientific units with mostly geographical responsibilities or disciplinary specializations and to perceive spatial connections of early cultures in a transregional perspective.

The TANA group, Prof. Wazi Apoh as well as his excellency, the Vice Ambassador of Germany in Ghana, Hans-Helge Sander, were kindly received at her offices by her excellency, the Vice Chancellor of the University of Ghana, Prof. Nana Aba Appiah Amfo (Photo: DAI)

One of the results of these efforts is the DFG-funded Priority Program "Entangled Africa: Inner African Relations between the Rainforest and the Mediterranean (c. 6,000 - 500 years before today)" (SPP 2143). Over a period of six years (2018-2024), the priority program will give numerous interdisciplinary groups from German research institutes the opportunity to work intensively on topics of their choice in northern hemispheric Africa. The central hypothesis is that transregional interactions of individuals and groups have decisively shaped the appearance of traditional Africa since the Late Holocene. A dynamic network of far-reaching intra-African relationships and movements emerged that had a formative influence on cultures and societies over the last millennia and in some respects are still of great importance today, in some cases even of considerable topical explosiveness.

An important field of activity for TANA is the support of our African partners regarding the protection of historical monuments and cultural assets. In this context, digital research

Top: Exploring avenues for cooperation between the DAI and the Department of Archaeology and Heritage Studies during a meeting with the Vice Chancellor of the University of Ghana (Photo: L. Ehlers). ***Left***: Wazi Apoh after receiving his certificate as a corresponding member of the DAI (Photo: D. Adjartey)

offers a great opportunity to facilitate cooperation on an equal term through joint access to knowledge resources such as libraries and archives. In this sense, the data and components of the DAI's digital world (iDAI.world) can be made accessible in a systematic manner. With our partners, digital registers of monuments and archives are also being jointly developed and preparations for applications for protection status, including UNESCO World Heritage Sites, are being supported.

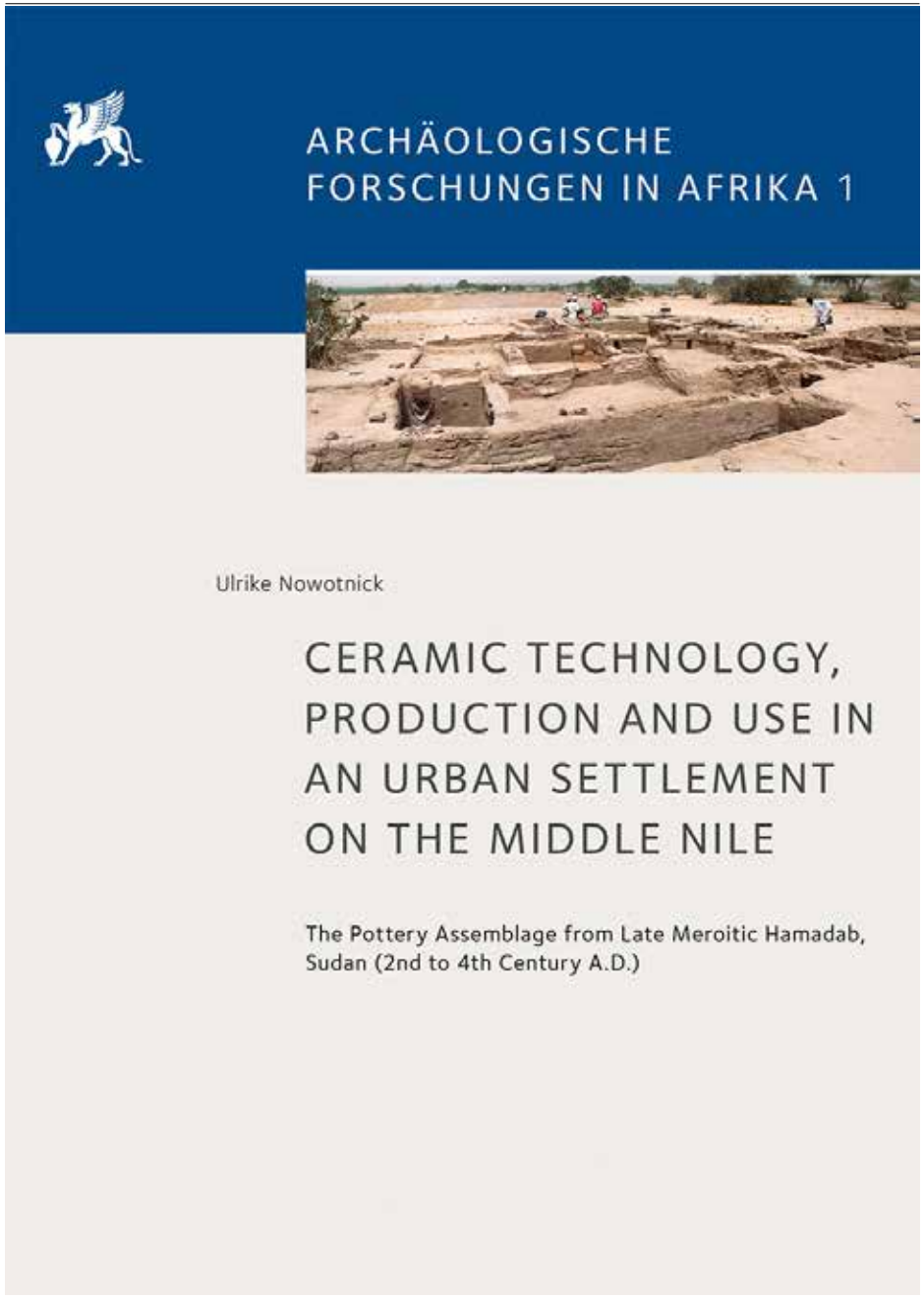
Field schools, a specific training format in which the application of advanced documentation, prospecting and remote sensing methods are taught, represent an integral part of most

DAI projects. However, as not all training demands can be met on site, we have decided to initiate the set up an online platform on archaeology and cultural heritage protection in Africa. In cooperation with the DAI, numerous African and European universities as well as other research institutes are participating in this project. The e-learning offer is aimed at students, teachers and political decision-makers, primarily in the DAI's host and partner countries. The focus is on regions that currently have a particular need due to a lack of structures or crises. The platform will go online in 2022.

Of particular importance are our annual meetings, which we organize in our host and partner countries whenever possible. In 2017, for example, we were able to meet in Tunis and in 2018 in Aswan with our respective Tunisian and Egyptian project partners.

Unfortunately, the pandemic prevented us from continuing this still young tradition. It was all the more pleasing for us to be able to hold our 2021 meeting in Accra, Ghana. Again, we had to cancel because of the Omicron variant that had just emerged but after a short postponement we were able to travel to Ghana in February 2022. We are particularly grateful to Prof. Wazi Apoh for keeping the door wide open despite the delay and for being able to organize with us an extremely successful meeting with many interesting lectures and excursions

Wazi Apoh guiding the TANA group on their trip to sites of the German colonial past in the Volta region of eastern Ghana (Steyler Mission site, Kpando) (Photo: S. Matthews)



despite the difficult conditions. The focus of the conference was the archaeology of the German colonial period. It is Prof. Apoh's main area of research. Collaboration has been established and the DAI is looking forward to future involvements in Ghana in this research area.

Finally, we would like to mention the publications of research on African archaeology of the DAI as well as the TANA activities. The monograph series "*Archäologische Forschungen in Afrika*" (AFA) was established for dissertations, conference proceedings or similar comprehensive works. The aim of the series is not only to achieve a better visibility of African research, but also to bundle the numerous research results of the individual departments and commissions working on the African continent. The monographs and collective contributions of the respective departments and commissions are published in German, English and French. AFA appears in the uniform layout of the Institute while the different color design of the cover marks the affiliation to the respective department or commission.

For further details on projects, participants and publications, please visit our TANA blog page https://www.dainst.blog/tana/de/home/.

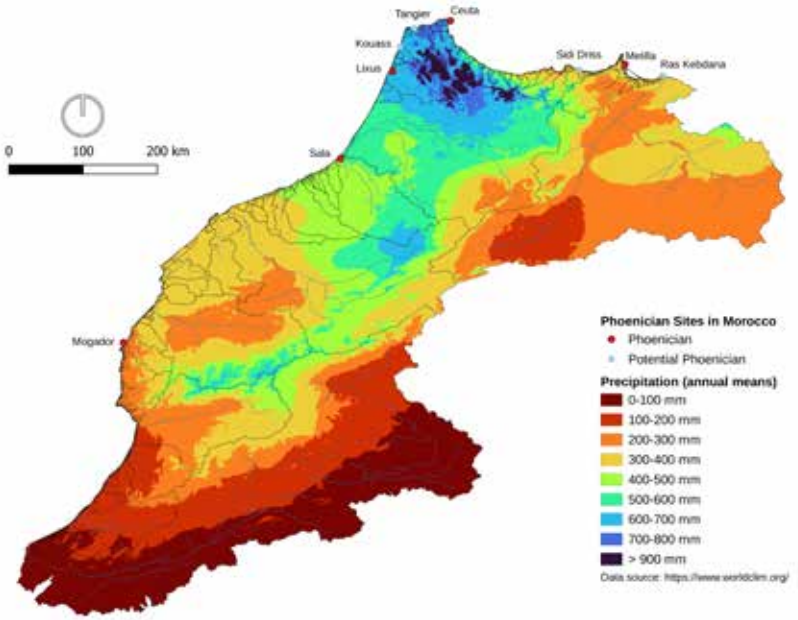
Northern Africa

Phoenicians in Morocco – Environmental factors

DIRK BLASCHTA

Due to the Corona pandemic, archaeological fieldwork in Morocco was not possible during the past few years. Nonetheless, it is possible to highlight positive aspects, as this time has given us an opportunity to prepare future research projects in advance in a targeted manner. Furthermore, we have been able to obtain novel scientific information that cannot be gathered through fieldwork alone.

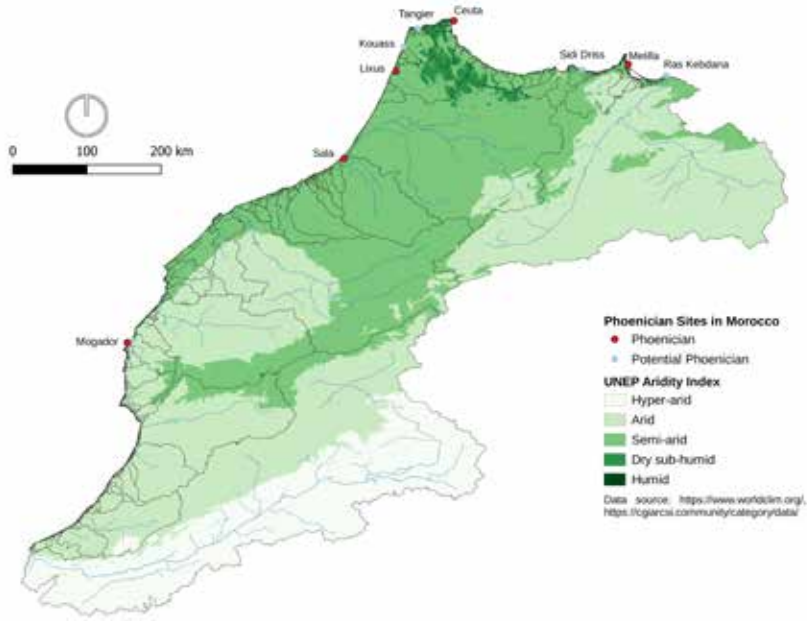
At the moment, the work in Northwest Africa is concentrated on the area of Morocco and is specifically focused on the Phoenician expansion phase (9th–7th century BCE) to the West during the Early Iron Age. The goal is to build a GIS system for this region and time frame. This system shall be kept open and expandable on a regional and temporal level. In addition to terrestrial satellite imagery, satellite imagery of the Atlantic Ocean and the Mediterranean Sea will be explored and evaluated in the course of our research. Terrestrial remote sensing data can be used, for example, to develop terrain models in various resolutions, from



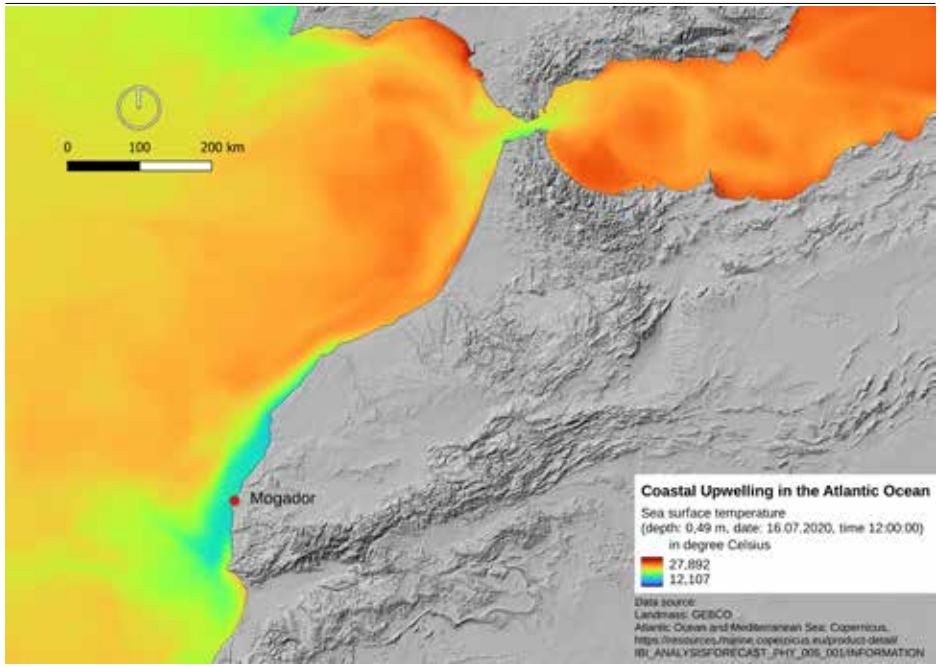
Phoenician and potential Phoenician Sites mapped with recent (1970–2000) annual precipitation values, drainage basins and streams (Map: D. Blaschta)

which calculations of terrain topography can then be derived. Examples include hydrological modeling or morphological terrain classification. Satellite images of the oceans reveal details regarding wind and ocean currents, which are relevant, especially for seafaring cultures such as the Phoenicians. Satellite observations of ocean temperatures can even provide clues to locations with particular marine resources. In addition to searching for suitable satellite imagery, a GIS site database is being developed in parallel to contextualize the archaeological information with the remote sensing data. Furthermore, special attention is given to the mapping of resources that were of interest to Phoenician traders during the Iron Age (e.g., metal deposits). In cooperation with the FU Berlin, work has also begun on collecting data on soil quality, vegetation and geology.

People have needed to, and continue to adapt to the diverse climatic conditions of Northwest Africa. The north and south coasts are exposed to Mediterranean and Atlantic influences. The Atlas Mountains, which run from southwest to northeast Morocco form a watershed that provides an arid climate in the south and east of the country and a climate in the northwest. Initially, it will be possible to assume that sufficient water resources must have provided good conditions for settlement locations. Especially along the Atlantic coast many Phoenician stations have been identified indicating a preference to settle near the mouths of



Phoenician and potential Phoenician Sites mapped with UNEP Aridity Index (I = P/ETP), drainage basins and streams (Map: D. Blaschta)



Coastal Upwelling (low sea surface temperatures) in the Atlantic Ocean points to favorable marine resources, as in the case of the Phoenician site of Mogador (Map: D. Blaschta)

large permanent water-bearing river systems, as are the cases of Lixus on the Loukkos, Sala on the Bou Regreg, or Mogador on the Oued Ksob. The special importance of Lixus in Phoenician times may also be due to its extremely favorable geographical situation in the estuary of a larger catchment area of 3765 sq. km with rainfalls of approximately 800 mm/year. The southernmost Phoenician station on the Atlantic coast was Mogador at the foot of the Oued Ksob, whose catchment area reaches a size of 1744 sq. km and has an average precipitation of 300 mm/year. Although this region can be described as arid/semi-arid climatically, it is still possible to grow rain-fed crops in the area without using artificial irrigation systems. The lower threshold for optimal wheat cultivation is about 250 mm/year. Excavation finds of charred wheat grains on the island of Mogador in the Phoenician layers does not prove cultivation on site, but there could have been a connection between climatic conditions and a permanent presence of Phoenician traders.

Along the Mediterranean coast, the situation is somewhat different. The catchment areas here are generally much smaller due to the geomorphological conditions of the terrain with the exception for the Moulouya river valley. No Phoenician sites have been found so far directly at the mouths of larger rivers such as the Oued Martíl (catchment area of 1157 sq. km),

though it may also be a consequence of research in the area. Potential evidence of Phoenician presence at Ras Kebdana, seven kilometers from the mouth of the Moulouya River, Morocco's second largest drainage basin (66590 sq. km), is indicative of a Phoenician strategy in site selection aimed at maximizing access to the hinterland. However, there is another point to be added, namely the control over strategically important locations. The Phoenician site at Ceuta, located directly opposite Gibraltar, is situated on a narrow passage separating an island with a mountain called "Monte Hacho" from the Moroccan mainland. The nearest estuary with sufficient water flow is about three to four kilometers away, being the Tarajal-River. It was not until Roman times that a connection was created between the two points by means of an aqueduct, which guaranteed a sufficient water supply for the citizens of ancient Ceuta. How Ceuta's water supply was secured in Phoenician times is still unclear. Whether or not the rainfall, which nowadays ranges between 700–800 mm, was sufficient to supply at least a small population must remain unanswered at this time.

Despite initial approaches, open questions remain that can only be clarified with targeted fieldwork, especially with regards to the reconstruction of paleoclimate and environment, which is of crucial importance to determine to what extent recent data can and may be used in the study of the Phoenician phenomenon.

The National Public Museum of Cherchell

ORTWIN DALLY / ULLA KREILINGER

The refurbishment of the National Public Museum of Cherchell in cooperation with the Algerian Ministry of Culture, accomplished in 2019, was substantially supported by the German Federal Foreign Office. The exhibition was completely reorganized and prepared for the public according to modern educational concepts. Visitors to the museum can rely on detailed information panels (in French and Arabic), whereas a guide book (in German and French) offers the access to further knowledge. Furthermore, audio guides in several languages and special texts for children have been prepared. Present efforts concentrate upon the completion of a book dedicated to the final scientific treatment of the sculptures (mainly their contextualization). This book will also present a general introduction into the historical topography of the city.

Half of the museum's exhibition is exclusively dedicated to the "royal period" (when the Roman Empire was ruled by Augustus, Tiberius and Caligula) lasting for 65 years. During that period the city transformed from a most modest Punic settlement (called Iol) into the magnificent residential city of client king Iuba II, his wife Cleopatra Selene and their son and successor Ptolemy. This city named Caesarea Mauretaniae offered everything that could be expected from a late Hellenistic city: City walls, theater, amphitheater, hippodrome, aque-

Left: Installing the pedestal for the statue of Apollo with its special earthquake-proof elements. ***Right***: The statue of Apollo on its new pedestal: the inner metal framework is encased by limestone (Photos: U. Kreilinger)

duct, thermal baths, temples, a lighthouse on the harbor peninsula and, above all, a palace complex that has now completely disappeared. But magnificent architectural elements and sculptures of unique quality as well as literary sources still bear witness of the unique splendor of this residence. The rest of the exhibition pertains to the Roman period of the city, in which Caesarea Mauretaniae remained a flourishing harbor city with the Roman provincial governor in residence. For this period, it is again sculptures and mosaics of quality that attest to the wealth and exquisite taste of the inhabitants.

As part of the Algerian-German cooperation since 2008, all rusting iron dowels from earlier restoration measures have been replaced by dowels made of stainless steel, and all sculptures are now put on new, earthquake-proof limestone pedestals. A team of well-trained restorers led by Alberto Fiorin discussed every single step with their Algerian colleagues to reach an optimal solution for every single ancient object. Additions needed for stabilization were made partly in limestone, partly in stainless steel. The Algerian staff members trained within the framework of our cooperation are now employed with further measures regarding cultural preservation. They secure and clean objects exhibited in the open courtyard and the garden of the National Museum. This also includes objects integrated in one of the museum's outer walls. The Cherchell project will continue – now with a special focus on the second museum of the city, the New Museum.

View onto the North Gallery (to the west) with the finds from the palace (Photo: H. Dahmani)

Top: Statue of a Roman citizen before restoration: rusty dowels from a previous restoration had caused star-shaped cracks. ***Left***: Intermediate piece for the statue of a Roman citizen, one made of plaster (in front) and one made of limestone (Photos: A. Fiorin). ***Right***: Statue of a Roman citizen after restoration: now a carefully carved intermediate element made of limestone and new stainless-steel dowels connect the statue with the pedestal (Photo: U. Kreilinger)

Simitthus/Chimtou – More than 50 years of Tunisian–German research cooperation

PHILIPP VON RUMMEL / HEIKE MÖLLER

Ancient Simitthus (modern Chimtou, Tunisia) is located in northwestern Tunisia near the Algerian border. Situated on the left bank of the Medjerda River, the city was part of the former Roman province Africa Proconsularis for over 500 years. The site is most famous for its important quarries of yellow Numidian marble.

Since almost 60 years archaeological research is conducted jointly by the Tunisian National Heritage Institute (INP) and the German Archaeological Institute (DAI). In the last decade the focus was set to the old excavations in the areas of the forum and the so-called "*Kaiserkultbau*". New research questions have been addressed and the ancient results have been verified and discussed due to new archaeological methods applied.

Recent excavations and radiocarbon dates have revealed the earliest traces of settlement at Chimtou hitherto, dating back to the eighth century BCE. During the prelude of the third Punic war, Numidia's king Massinissa seized the extremely fertile region of the Medjerda valley, the Campi Magni, from Carthage. The monument at the summit of Djebel Bourfifa was most likely erected during the reign of his son, Micipsa (148–118 BCE).

Simitthus became part of the Roman province Africa Nova in 46 BCE and was granted the status of a colony under Augustus named Colonia Iulia Augusta Numidica Simitthensium. After almost 500 years of Roman rule, the region became part of the Vandal Kingdom in 439 CE. It was reintegrated into the Eastern Roman Empire in 533 CE under Justinian but then conquered by Arab troops in the second half of the seventh century. The latest archaeological traces date from the 11th century CE.

Simitthus – Cityscapes (Photo: H. Möller)

View from the Hellenistic Monument to the ancient city (Photo: H. Möller)

View to the so called *Kaiserkultbau* (Photo: H. Möller)

Simitthus – Cityscapes (Photo: H. Möller)

Knowledge of the antique city was considerably enhanced by new research on trading networks of the city and its hinterland. The first mining of the quarries is traceable to the second century BCE along with the first more complex infrastructure in Simitthus and continuous mining has been traced until late antiquity, but is same phenomena seen looking at the ceramic evidence? Within the next years the focus is set on local/regional productions and their distribution range at micro-regional and broader Mediterranean scale. Big data collections gained from excavated well stratified sequences in Simitthus will help to learn more about trade and exchange networks of inland regions and their changes over time.

Under the supervision of Jan Martin Klessing, huge restoration processes are being carried out in many areas of the former city, including the reconstruction of the temple podium and the Roman and Arabic houses in the forum zone. The *mise en valeur* – work done results into a unit with the museum that was opened in 1996, displaying the most prominent artefacts found within the city and its surroundings.

ISLAMAFR – Conquest, ecology and economy in Islamic North Africa – The example of the Central Medjerda Valley (DFG/AHRC)

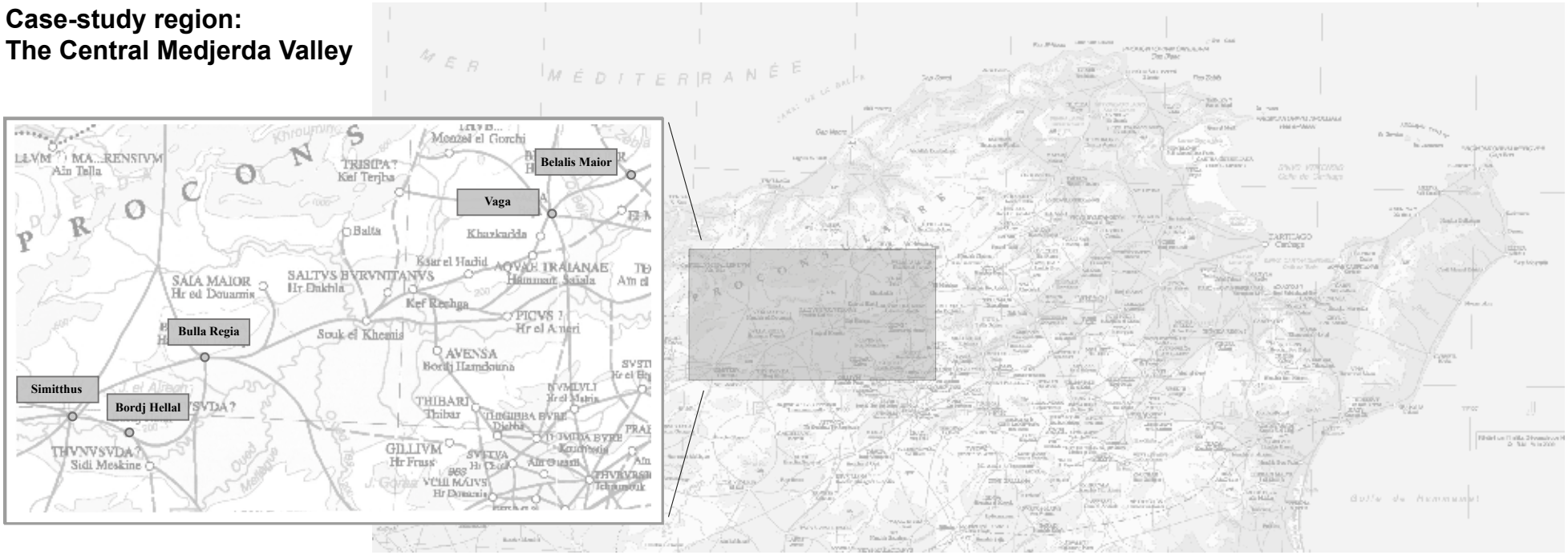
PHILIPP VON RUMMEL / HEIKE MÖLLER

The Muslim conquest of North Africa and subsequent regime changes resulted in widespread changes in urbanism, agriculture and regional economies which are fundamental to understanding the development of North African society, united under Islam. Recent synthetic studies challenge what has long been the textbook understanding of the collapse of Roman rule and the impact of the Muslim conquests in North Africa, in which the eighth and ninth centuries have often been seen as a dark age. Ongoing excavations at the important, neighboring urban centers of Simitthus (Chimtou) and Bulla Regia (Hammam Darraji) in NW Tunisia have highlighted the complexity of urban trajectories, technological innovation and environmental change in the medieval period.

The project, headed by Corisande Fenwick (UCL-London) and Philipp von Rummel (DAI-Berlin) in cooperation with Moheddine Chaouali (INP-Tunis) is built on these findings, addressing a fundamental gap in our understanding of cultural, economic and landscape transformations in medieval North Africa. Moving beyond the simple question of urban continuity or collapse in late antiquity and the early medieval period, it will investigate the extent to which the Muslim conquests and subsequent regime change represented a force of economic and social transformation. This will be assessed by tracking long-term changes in settlement patterns, landscape use, patterns of exploitation

Simitthus – Temple Area with Late Antique and Medieval Rebuilding Structures (Photo: H. Möller)

Case-study region: The Central Medjerda Valley



Case-Study Region – The Central Medjerda Valley (Map: H. Möller after Salama 2010)

and technology in the central Medjerda valley. The project evaluates for the moment five sites with different trajectories in the medieval period – Bulla Regia, Simitthus and Bordj Hellal in the west Vaga and Belalis Maior in the east of the case study region. Topographic and geophysical surveys have partly been done and will continue in the next months in order to identify suitable zones for excavation. Following this evaluation, the sites will be targeted with a systematic sampling strategy aimed at recovering a stratified material culture sequence and a high density of plant and animal remains associated with occupation sequences. Environmental data will be extracted from the sites' hinterlands to understand changing climatic and environmental conditions. This data will be synthesized with relevant Latin, Greek and Arabic sources. The results will be contextualized within broader trends in the Mediterranean and the Islamic world which characterize the 'first Islamic millennium'. This project will ultimately result in both a fundamental advance of our understanding of Islamic North Africa and a new interpretative framework which can be applied to other regions of the Islamic world.

Bordj Hellal – Project leader discussions on site (Photo: H. Möller)

Belalis Maior (Photo: P. von Rummel)

Henchir Bourgou (Djerba/Tunisia) – More than thousand years of settlement history

PHILIPP VON RUMMEL / HEIKE MÖLLER

Henchir Bourgou (Photo: P. von Rummel)

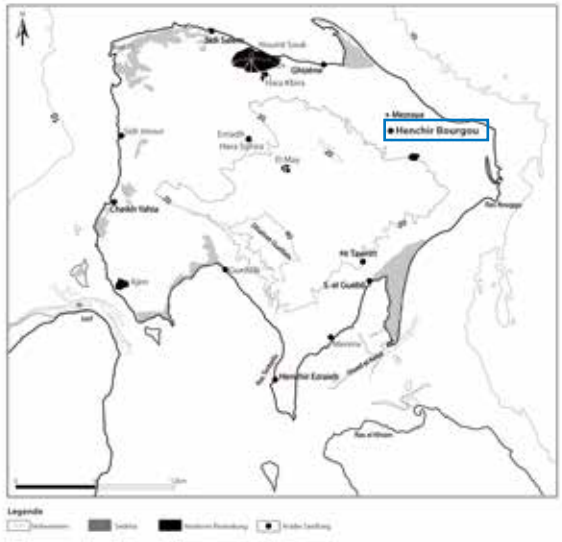
Henchir Bourgou is an ancient settlement of about 20 ha in the north-eastern hinterland of the island of Djerba. The ancient name is still unknown, although there are various references to the oppidum Phoar/Thoar mentioned by Pliny. Despite significant finds from surface surveys and the stately remains of a Hellenistic Mausoleum, which indicate a significant role of Henchir Bourgou in pre-Roman times, the ancient site was not initially listed as historical site. This was not achieved until 2017, when a considerable part of the ancient area was threatened with being built over by a shopping mall. In response to an urgent request for assistance from the Institut National du Patrimoine (INP/Tunisia), the Scientific Department of the DAI Head Office and the Ludwig-Maximilians-University of Munich carried out a magnetometer survey that covered around half of the ancient settlement area, revealing an enormous density of ancient buildings. An excavation on site conducted by the Tunisian colleagues in the summer of 2018 and the processing of the finds by an international team the following year showed a stratigraphy whose layers can be dated from the eighth century BCE to the second century CE. The results have been published in *Archäologischer Anzeiger* 2021/2, using for

Pottery from one of the oldest layers in Henchir Bourgou (8th/7th century BCE) (Photo: B. Schumann)

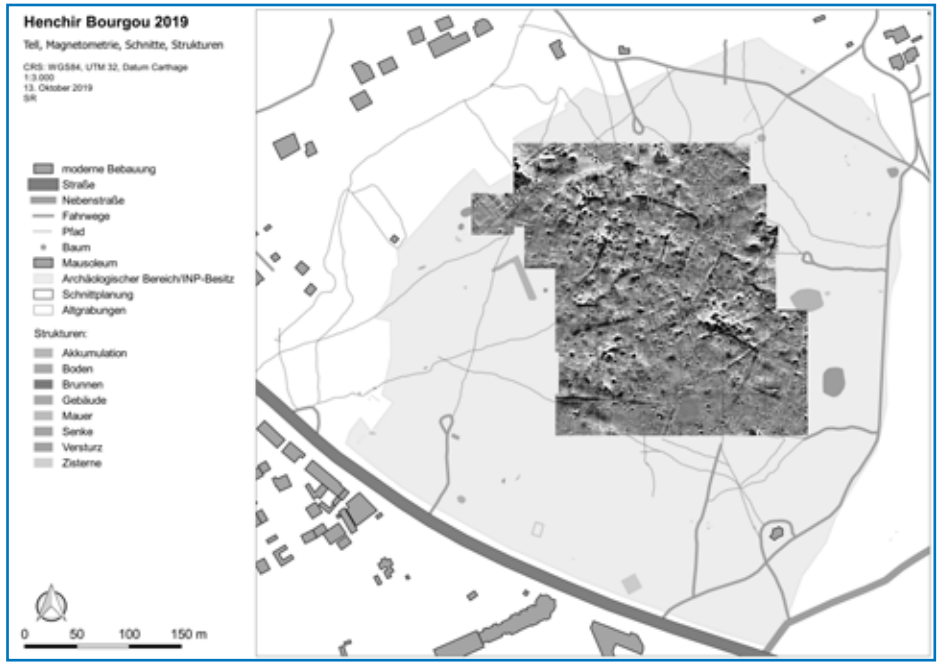
the first-time digital supplementation of research data in the web version of the projects database iDAI.field2, which is available online.

In the next years, the focus will be set to questions of settlement structure and history. Economic relations between Djerba and other regions of the Mediterranean and the Saharan/Subsaharan hinterland will be further analyzed and discussed.

Already now Bourgou can be seen as an important relay station between the Mediterranean and Trans-Saharan communication lines, even before the Phoenician colonization of the island. Interdisciplinary studies will further differentiate and clarify the picture previously obtained. The planned studies include also the research on environmental and climatic history of the site and Djerba in general. Results are to be compared to other inland sites and the coastal town of Meninx, which is about 15 km away and has been under investigation since 2015 as part of a research project by LMU Munich and INP. Especially Meninx and Bourgou offer an excellent case study for a systematic comparison of two neighboring sites due to their different location on one hand and their completely different settlement development and character on the other.



Map of Djerba with ancient sites (Map: H. Möller after Ben Ouezdou 2007)



Plan of geomagnetics (J. Fassbinder), surface structures and trenches (Plan: S. Reichmuth)


Northeastern Africa

Egyptian cherts – Insights into economic networks

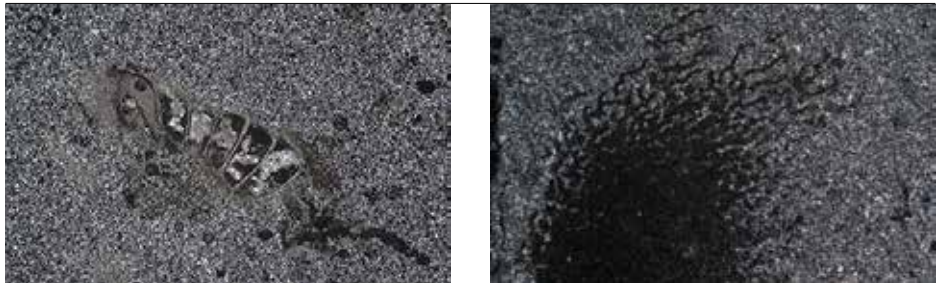
CLARA JEUTHE

Lithic industries dating to the dynastic periods in Ancient Egypt were never much in the focus of research. However, until the introduction of iron tools and their wide circulation in the beginning first millennium BCE, tools made from chert (also called flint) were crucial for the Ancient Egypt state and its economics. This is especially true for the sickle implements. Without them, the harvesting of grain would have been not possible on a large scale as needed in Ancient Egypt and the bread supply for workmen teams would be not available. To put it exaggerated, there would be no pyramids without sickle implements and hence the Ancient Egyptian state had a certain interest in the tools production and distribution.

The analysis of networks and supply of chert also helps us to understand the dynamics within an individual settlement site and the support of the local authorities for specific crafts and/or groups of persons, thus allowing an insight into a local society and workflow organization. Yet neither the workflow's organization, the networks for supply and distribution throughout the Nile Valley and their potential regional patterns changing of time are well studied.

A crucial problem is the identification of potential provenance of raw materials and the actual explored sources in Egypt. While the quarries exploited during the predynastic and prehistoric periods are better known, those dating to the dynastic times remains scare and only two are investigated more recently. By contrast, we notice a huge range of varieties of raw materials in the assemblages coming from different settlements, dating roughly from the Early Dynastic Period into the ending New Kingdom (c. 2800–1070 BCE). Therefore a first attempt has been recently undertaken by including selected samples for petrographic

Mountain formations with flint-bearing bedding layers in the Gâlâla North area (Photo: C. Jeuthe)



Thinsections showing a macro-fossil (gastropod) (***left***) and algae remains (***right***) (Photos: C. Jeuthe)

studies as well as applying various methods such as such as Trace Elements Analyses, Rare Earth Analyses, XRD, etc. in order to test the relevance of these techniques as provenance indicators.

However, because of the limited numbers of samples, the inhomogeneity of the stone and the lacking access to the regions of potential sources, these first results can only be used as support for the petrographic analyses of thin-sections and not be used as evidence on their own. So far, most useful as indicator proofed to be the relationship between the micro- and macro fossils, which should be followed up further in the future. While specific quarries cannot be identified by the petrographic studies, the characteristics based on geological formations and regions may indicate potential sources of origins. Basing on these preliminary results, the on-site material groups can be reviewed and further similarities or differences between the sites defined. By adding finds coming from further settlements as puzzle pieces, we hope to be able to outline differences in supply strategies and networks in the different periods as well as to highlighted regional dynamics.

Left: Sickle implement found in the settlement of Elephantine Island (Photo: C. Jeuthe). ***Top***: Experimental stone tool production (Photo: Y. Gourdon)

Tabular chert outcrops in the Kharga Oasis region (Photo: C. Jeuthe)

Balat, view to the north towards the Egyptian Pharaonic site (Photo: C. Jeuthe)

Balat (Dakhla Oasis / Egypt) – A cultural contact zone?

CLARA JEUTHE

The area north of the modern village Balat at the eastern edge Dakhla Oasis / Western Desert Egypt is rich of archaeological remains dating to various historical periods. The area has been always favorable, especially in the harsh arid environment of the Western Desert, because of its various artesian springs with adjunct green lands. In addition, from here the ancient track Darb el Tawil started, leading to the Nile Valley, as well as tracks to the neighboring Kharga Oasis and tracks towards the south-west, leading to the Gilf Kebir region and beyond.

However, the today most prominent archaeological structures at Balat are the Egyptian Pharaonic settlement(s) of Ayn Asil with its necropolis Qila el-Dab'a, dating from the late Old Kingdom to the Early Middle Kingdom (c. 2350–1950 BCE). During this period, Ayn Asil was the capital of the oasis, the seat of the governors and local power. The site is since more than 40 years in the focus of research of the Institut français d'archéologie orientale in Cairo (IFAO). Especially the so-called "governor palace" is extensively excavated, a large complex including various bakeries, workshops, storage areas and cult chapels aside from the actual residence.

As it seems, neither the social structure, the administration and the material culture differ much from what we know from sites from the Nile Valley of this time. However, while an expansion of the Egyptian Pharaonic culture from the Nile Valley to the Western Desert and the Oasis during the Old Kingdom is well attested in the archaeological data and historical sourc-

es, the indigenous population of the oasis is less well known. In Dakhla Oasis, only a very few sites of the local Sheikh Muftah group have been investigated yet and their interaction with the Egyptian Pharaonic population, the process of assimilation and possible cross-cultural influence is hardly understood.

To tackle this, recent investigations by the IFAO mission at Balat included also a large residential camp site of the Sheikh Muftah group which is situated less than 100 m north of the Egyptian Pharaonic settlement structures. Thanks to the well preserved stratigraphy and the unique features, the excavations provided for the first time detailed insights into the camp life of the Sheikh Muftah group and valuable hints for their subsistence and life-style, which is strongly rooted in nomadic traditions. Yet the interplay between the nomadic traditions of the oasis population and the Egyptian Pharaonic culture coming from the Nile Valley is only exceptionally visible in the material culture at both sites in Balat and the link between the Sheikh Muftah site and Ayn Asil is still missing. If the material culture at Ayn Asil appears to be consistently "Egyptian" in character and if, for example, the choice of raw materials attests is a local but not culturally specifically designated strategy, it remains unclear why local traditions are hardly definable.

Left: Examples of called Clayton rings, objects typically related to the Sheikh Muftah group, found in the Egyptian Pharaonic contexts in Ayn Asil. ***Right***: Balat, characteristic vessel of the Sheikh Muftah group (Photos: I. Mohamed Ibrahim)

One reason behind could be a time gap as the Sheikh Muftah site predates the known settlement in Ayn Asil with around 300 years. But although Ayn Asil dates not earlier than (late) Old Kingdom (late second millenium BCE), other Egyptian Pharaonic sites in the oasis date to the same time as our Sheikh Muftah site. However, they are only investigated by survey or are hardly accessible today.

By contrast, another site in Balat just next to the Sheikh Muftah site has been identified recently and its surface ceramics point to a date similar or close to the Sheikh Muftah site. Hence its investigation could offer the "missing link": Was there a greater admixture of traditions beforehand that would actually provide evidence of an assimilation of the Sheikh Muftah group, which had – so far – only been assumed? Is the local Egyptian Pharaonic material culture in Balat always largely "Egyptian" or does it reflect more strongly different social and ethnic groups? Is Balat a cultural contact zone or did these culturally distinct groups have hardly any influence on each other?

View from Ayn Asil to the north (Photo: G. Soukiassian)

Households at a cultural and environmental crossroads

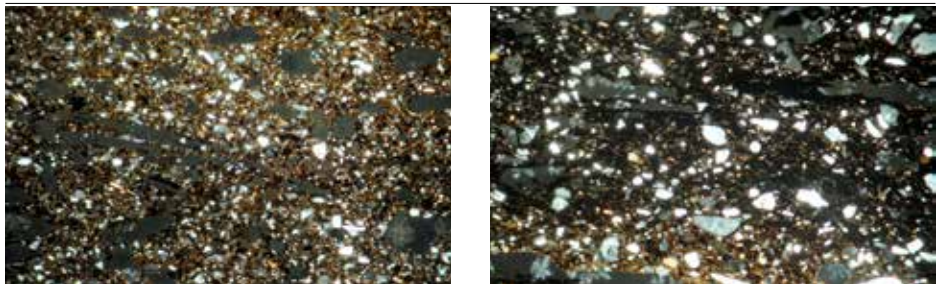
JOHANNA SIGL / PETER KOPP / ELSHAFAEY A. E. ATTIA / CLAIRE J. MALLESON / MARY F. OWNBY / MARIE-KRISTIN SCHRÖDER / LESLIE A. WARDEN

Elephantine Island (today *Gezirat Aswan*) is situated at the northern end of the First Cataract of the Nile at Aswan, Egypt. This area was perceived by the ancient Egyptians as the southern gateway to the African continent. The German Archaeological Institute Cairo and its partners since many years have undertaken research on archaeological remains in this contact zone of the Pharaonic and Nubian peoples, with special focus on the settlement hill on Elephantine Island.

Since 2013, the archaeological project "Realities of Life" has investigated households of the Pharaonic settlement. The focus lies on buildings dating to the 13th Dynasty, late Middle Kingdom (c. 1700 BCE) at the northwestern end of the preserved *kom*. A variety of archaeological and scientific methods have been employed in the study of both features and finds. The excavated materials show the use of many resources of the region by the inhabitants, among them Nile Silt for pottery and plants harvested for food and other purposes. Besides these local resources trade and exchange especially with the Nubian people south of the First Cataract took place.

The town of Elephantine is one of few accessible sites in Egypt or Northern Sudan where Nubian pottery can be studied from a settlement context. They form in average between 1–2 % of sherds in the whole pottery assemblage from Late Middle Kingdom stratigraphic layers. The distinct vessel shapes, color and decorative designs are easily recognizable. The addition of certain tempers, like fine organic fibers, and the handmade manufacturing of the vessels are

Top: Plain Egyptian storage vessel from House 169 at Elephantine (Photo: P. Kopp). ***Bottom***: Nubian vessel in the style of the Pan-Grave culture at Elephantine with the characteristic "spider web" base decoration (Photo: J. Garzon).



Sherd probably made in Nubia – long voids represent the added plant remains and ash (***left***) – and another sherd made from clay from the First Nile Cataract at Aswan (***right***) (XPL, 100x, Photos: M. F. Ownby at IFAO).

typical for this kind of pottery as it is known mainly from south of the First Cataract. But in fact only a few vessels from the current study area were actually imported from Nubia. Astonishingly, petrographic analysis revealed that most ceramics in Nubian style were, like the ones in Pharaonic style, produced from clay sources local to the First Cataract region: the sherds are containing volcanic rock fragments and microcline (from granite), which are typical for the Aswan area. These vessels shaped in the style of the so-called Pan-Grave culture are proof for the exchange of technologies or of the close living proximity of Pharaonic and Nubian peoples in the First Cataract area, and maybe even within the houses at Elephantine. Furthermore, the production of wheel-made pottery with Nubian style decoration shows the popularity of these Nubian influenced vessels by the local population.

While pottery is the most visual indicator for cultural exchange around Elephantine Island, the botanical material shows that the inhabitants of the area dealt – in contrast to people living further north in the Pharaonic heartland – with environmental conditions similar to those observed south of the First Cataract. Cereals were one of the staple foods consumed in ancient Egypt. Barley and wheat, both domesticated in the Near East, were mainly used to produce bread and beer. Among the material from the late Middle Kingdom houses at Elephantine, barley, which is more drought and heat resistant, dominated the archeobotanical assemblage. While the rachis internodes were distinctly 6-row barley (*Hordeum vulgare* ssp. *vulgare*), many of the barley grains showed signs of being infertile, a feature more commonly associated with 2-row barley (*Hordeum vulgare* ssp. *distichum*). A similar observation was made in Qasr Ibrim, some 172 km south of Aswan. The barley remains from

From ostrich egg fragment to finished bead: all stages of production of small jewelry items from this raw material were found (Photo: P. Kopp)

this site were identified by aDNA analysis as 6-row-barley, even though they visually resembled the 2-row variant of the crop. We agree with the conclusion that this genetic change was a result of environmental pressure, specifically a lack of access to water. Similar observations were made at the Sudanese archaeological sites Amara West and Nauri. While these sites on the Nubian territory date to the first millennium CE and later, the evidence from the Realities of Life project may indicate that this genetic adaptation of 6-row barley to the especially dry conditions was already present, or in process, in the upper Nile from at least the mid-second millennium BCE.

Lastly, items of uncertain origin are ostrich eggshell fragments. They were widely used for the production of, amongst other things, small beads and strung into jewelry throughout most of Africa. Ostriches must have been present throughout most of the Pharaonic period and even into modern times in the northern Nile valley. Only in the 1960s was the last specimen of the Arabian Ostrich (*Struthio camelus syriacus*), a subspecies of the African Ostrich (*Struthio camelus*), killed on the Sinai Peninsula. Papyrological evidence allows the tracing of captured individuals in Egypt back into the first millennium BCE. Depictions from Egyptian tombs of the Old to New Kingdom show ostrich eggs, plumes and even actual birds. The birds can be part of hunting scenes in the desert, but especially in the New Kingdom both the animals and their products are more often shown in context of trade and tribute caravans from Nubia and beyond. In the houses under investigation by the Realities of Life project, the whole production process of ostrich egg beads can be traced, from shell fragments to finished jewelry. One of the questions that still remain to be addressed in the project is: where did the raw material for these items come from – Egypt or Nubia? The answer to this question will provide yet another piece in the mosaic picture of the Egyptian-Nubian interactions at the settlement of Elephantine.

Top: Sterile barley grains (Photo: C. J. Malleson). ***Right***: Study of botanical macro-remains in the scope of the Realities of Life project (Photo: P. Kopp)

Reconstruction of Nubian settlement patterns on the example of C-group habitation sites at Amada

MARIE-KRISTIN SCHRÖDER

Archaeological investigations during the course of the "International Campaign to Save the Monuments of Nubia", launched by the UNESCO in 1960, resulted in a vast 20-year-long survey of the Lower Nubian Nile Valley between the First and Second Nile Cataracts. As a result of the irretrievable loss of this cultural landscape due to the completion of the Aswan High Dam, the archaeological investigations carried out in the past are of high importance especially today for the research of Nubian cultures and Egyptian-Nubian interactions.

The German Archaeological Institute Cairo, with the former director Hanns Stock (1908-1966), answered the call from the UNESCO and undertook archaeological research in the area of Amada, located at the Korosko Bend in Lower Nubia, c. 190 km south of Aswan. This stretch was rich in archaeological remains and in addition to the causeway leading to the Temple of Amada, settlement structures and cemeteries were uncovered.

A few habitations were associated with the Nubian so-called C-Group culture (c. 2300–1800 BCE), which is attested from Upper Egypt to the Third Nile Cataract in Sudan. Characteristic for this culture are small to large cemeteries with tumulus tombs, a distinct hand-made and elaborate decorated pottery production as well as a few settlements.

At Amada, the C-Group settlement remains comprise of circular and semi-circular structures that are built from stones with standing stone slabs on the interior walls of the houses. These interior walls seem to divide the houses into several rooms and the material culture found in the different settlement layers includes pottery sherds, stone tools, jewelery, Egyptian scarabs and pendants as well as botanical and archaeozoological remains.

Characteristic C-Group pottery from Elephantine: Red incised decorated fine ware (***left***) (Photo: J. Garzon). Black-topped red polished decorated fine ware (***right***) (Photo: P. Kopp)

One of the C-Group habitations at Amada. View from River Nile (Photo: Archive DAI Cairo)

Until now, the habitations at Amada are only preliminary published and therefore the site remains largely unknown, although it is often mentioned as yet another C-Group settlement. However, the archives at the German Archaeological Institute Cairo and the Institut français d'archéologie orientale in Cairo store parts of the documentation of the excavations carried out by Fernand Debono under the direction of Hanns Stock. This material is part of a current research project at the DAI Cairo in the context of the research fellowship granted by the German Archaeological Institute. Through internal reports, excavation diaries and many notes, the different C-Group habitation sites come back to life and drawings as well as photographs of the houses and finds, mainly pottery sherds, complement the written sources.

For the reconstruction of C-Group settlement patterns, every excavated site is of high importance, especially since the Lower Nubian Nile Valley is forever lost in Lake Nasser. With Amada, another piece in the puzzle can be added. The architectural remains, the ceramic inventory and small finds from Amada can be compared to other contemporary sites such as Wadi es-Sebua', Sayala, Aniba and Wadi el-Arab. Furthermore, a comparison of the Nubian pottery from Amada and Elephantine will allow a more precise dating than the rough dating to the Middle Kingdom by Fernand Debono.

The primary outcome of the fellowship is a detailed publication of this important site and a reconstruction of C-Group settlement patterns.

Characteristic C-Group pottery from Elephantine, utilitarian coarse ware that is, utilitarian coarse ware, showing a sooted exterior deriving from the use of the vessel in a fire place (Photo: J. Garzon)

Sand removal around the pyramid chapels of the northern royal cemetery (Photo: P. Wolf)

The Royal Pyramids of Meroe – An international cooperation for the study and the development of a World Heritage Site

ALEXANDRA RIEDEL / MAHMOUD SULIMAN BASHIR / PAWEL WOLF

The pyramid cemeteries of Meroe belong to Sudan's most important archaeological sites and represent an impressive tourist attraction. The three royal necropolises are situated in a still almost pristine landscape, some kilometers east of Meroe City, the ancient capital of the Kushite kingdom during the Meroitic period. They comprise hundreds of tombs of Kushite rulers and officials from the ninth century BCE until the fourth century CE. Most impressive are the up to 30 m high sandstone pyramids – originally more than one hundred in number. Their offering chapels and subterranean burial chambers were highly decorated with reliefs and wall paintings, and the tombs were originally furnished with an abundance of grave goods for the monarchs' afterlife. Even though these burials have been looted throughout history, the cemeteries still feature the most comprehensive repertoire of funerary architecture and iconography and yielded the largest collection of grave goods dating to that period. In 2011, the necropolises and the royal city of Meroe were included into the UNESCO World Heritage List due to their authenticity and outstanding universal value. However, the sites are adversely affected by changing environmental conditions such as an ongoing desertification on the one hand, and the extreme Nil flood in autumn 2020 on the other, by urban growth, industrial

Documentation work in the burial chambers of Queen Khennuwa's pyramid (Photo: P. Wolf)

and agricultural development and by increasing tourism. In particular, sand abrasion seriously endangers the monuments.

In 2014, Sudan's Heritage authority, the National Corporation for Antiquities and Museums (NCAM) and Qatar Museums (QM) invited the German Archaeological Institute (DAI) to join a large-scale research, conservation and management project at the pyramids of Meroe – the Qatari Mission for the Pyramids of Sudan (QMPS). The goal of this mission, funded by the Qatar-Sudan Archaeological Project (QSAP), was to develop the World Heritage Site and to save its endangered monuments.

The international team of the NCAM, the QMPS and the DAI has done impressive work in the years since then: 3D scans of about 40 pyramids and high-resolution records of their decoration yielded topographic maps, architectural plans, detailed 3D models, and ortho-photographic images that now provide a solid foundation for research and conservation. A detailed archaeological survey and a large-scale geophysical prospection were carried out in the area of the cemeteries, and last but not least, the archive of the late German architect Friedrich Wilhelm Hinkel, who had meticulously documented the cemeteries in the last three decades of the 20th century, was digitized and made publicly accessible at the DAI in Berlin.

A highlight of the fieldwork was the re-excavation of two pyramids: Beg. S. 503, the grave of the Kushite Queen Khennuwa, and Beg. N. 9. About a century after their first excavation in 1921–1923 by the American archaeologist George A. Reisner, their burial chambers were re-opened for new documentation using modern recording methods and further archaeological

research. The chambers, situated more than 6 meters below their pyramids, were decorated with partially well-preserved paintings and hieroglyphic texts, but just briefly documented in the 1920s. In the burial chamber of the pyramid Beg. N. 9, Reisner had deposited finds and ceramics, which remained at the site. These objects have now been recovered for archaeological investigation.

Important results have been achieved as well for the preservation and presentation of the site: Preservation work commenced by an assessment and mapping of damages as well as by conservation tests, on the basis of which a general conservation concept was established. Urgent security measures were executed and preventive conservation started in various parts of the cemeteries. Five pyramid chapels with unique reliefs were conserved and restored. Among them is the offering chapel of pyramid Beg. N. 2, which was in danger of collapsing. It was dismantled, each stone consolidated and restored and finally rebuilt in its original place. Not least, a project was initiated to establish vegetation belts to reduce sand abrasion in the cemeteries.

Conservation work at Meroe has many facets, among them delicate conservation and restoration of colored sand stone relief scenes (***right***) (Photo: D. Rütt) and maintenance of reconstructed chapel walls and roofs (***left***) (Photo: T. Bunk)

A visitor assessment was an important starting point for the creation of a master tourism plan for the Greater Meroe region, based on which a new entrance to the ancient site and the 'Begrawiya Visitor Centre' – the first of its kind in Sudan – were built in 2018-2019. It is home to a panel exhibition that provides essential information on the ancient sites of the Meroitic kingdom and also houses administrative offices for the regional antiquities authority. In addition, the installation of an overall site management was initiated: Former site facilities such as working areas and storage rooms were rehabilitated. A heritage-preservation-team was set up to ensure permanent maintenance and monitoring as well as to improve public relations.

Documentation training course in autumn 2021 at Meroe (Photo: I. Klose)

An education program for local teachers and school groups was launched and a training workshop for tourist guides was organized.

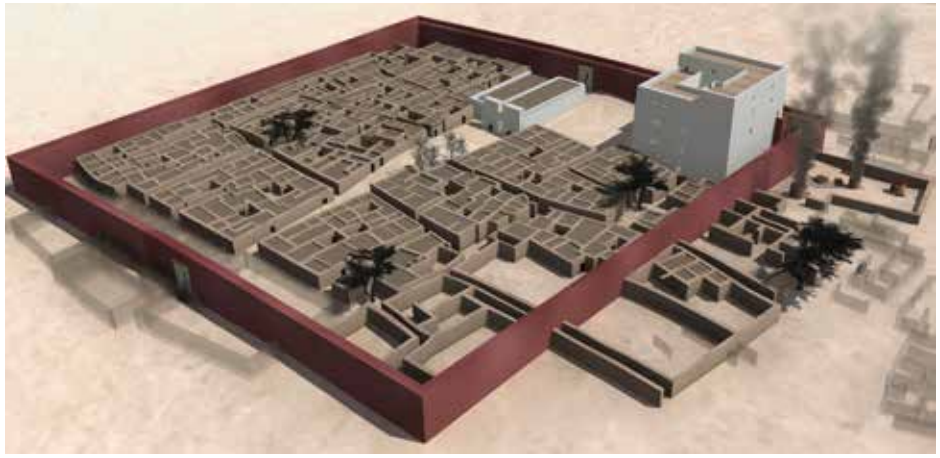
In 2020-2021, joint German-Sudanese educational workshops were started at Meroe for participants from various professional groups such as restorers, archaeologists, artists, local craftsmen and workers. The courses provided training on the registration and documentation of cultural heritage as well as on its conservation and preservation. In addition to theoretical basics, the courses also taught the implementation of a heritage registry and of practical conservation measures. In the long term, these joint activities shall help to establish a sustainable local site management and to install a modern construction hut for the sites.

Hamadab Archaeological Project

ULRIKE NOWOTNICK / PAWEL WOLF

Hamadab is an ancient town on the river Nile that changed our perception on urbanity in sub-Saharan Africa during the Iron Age. Excavations and interdisciplinary investigations, carried out by a joint German-Sudanese project since 2001, revealed the plan of a formerly unknown Meroitic town site and its organization into domestic, administrative, sacral and industrial quarters. Research has focused on its urban structure, the living conditions of its inhabitants as well as its socio-economic and cultural aspects.

The settlement of Hamadab developed from a centrally planned and well-formatted town of the second century BCE into an irregular urban conglomerate towards the fourth century CE. Like neighboring Meroe, the capital of Kush, this non-elite settlement consisted of a walled part and an open suburb with production areas. The enclosed Upper Town of one hectare size featured a temple, a massive administrative tower building, domestic housing blocks and infrastructural facilities. A wide main road led from the Nile to the temple and a network of narrow passages provided access to densely built residential blocks. Single-storey mudbrick houses occupied about 80 % of the Upper Town, being internally divided into six to eight households. They comprised living and storage rooms, kitchens with fire places, cooking pots and storage vessels, work spaces and open courts. Some entrance rooms, kitchens or partition doors were commonly used, illustrating close interaction among neighbors and a high occupation density in the living quarter. Assuming 3–9 individuals per household, a



Virtual reconstruction of the walled Upper Town (c. 2nd century BCE–4th century CE), featuring dense mud-brick houses, the temple and the tower house. Beyond the walled town there are further habitation quarters and workshop areas with pottery kilns and iron furnaces. (Image: C. Hof)

Plan of ancient Hamadab with walled Upper Town and open suburb (c. 2nd century BCE–4th century CE) (Image: Hamadab Project)

Spindle whorls as well as loom weights found in various parts of the living quarters attest to widespread activities in textile production (Photo: P. Wolf)

residence block might have housed up to 70 people, resulting in a rough estimate of 500–800 inhabitants for the Upper Town.

Hamadab's citizens lived on small space but were by no means 'poor'. They used a diversified range of utilitarian items and had access to luxury goods, such as fine table wares, pottery of Hellenistic style and Roman glass. While evidence of farming and stock keeping or weaponry is largely missing in the town, small finds like loom weights, spindle whorls, iron and stone implements indicate that the urban population consisted of craftspeople, workmen and commoners with their families. They carried out home-based handcrafts like stone working or textile production and manufactured standardized goods of ceramics, iron, glass and faïence in suburban workshops. Seal finds testify to an administrative agency involved in these processes. Sorghum, millet and cattle dominated the diet and cash crops such as cotton were cultivated nearby.

Small finds from a Late Meroitic house (2nd–4th century CE): lamp and animal figurine of fired clay, stone pendant in the shape of a hippopotamus, iron arrow head (Photo: P. Wolf)

The unique layout sets this urban settlement apart from all other sites along the Middle Nile. It might relate to an organizational form of craft production that is hitherto unattested in the Kushite kingdom, contemporary to the Hellenistic and Ptolemaic north. Hamadab may have been a state-run site that played a significant economic role in the Meroitic kingdom, being part of a redistributive system that exchanged manufactured goods for staples. Close by the power center of the Meroitic state and regarding its controlled space, Hamadab's urban specialists and their activities were probably monitored by state officials.

From the second century CE onwards, the economic and political downfall of the Meroitic state is clearly reflected by developments in the town of Hamadab as well. Comparable to late Roman towns in the north, Hamadab's urban layout grew into an increasingly irregular agglomeration while official and infrastructural facilities fell into neglect, indicating a lack of central support. Yet, still in the fourth century CE, Hamadab's population increased and the settlement sprawled into the suburbs with urban features as well as craft production surviving the end of the Meroitic dynasty for about a century.

The project, directed by Pawel Wolf and Ulrike Nowotnick, received financial support by the DAI, the DFG and by the Qatar Sudan Archaeological Project. Future research will focus on the evaluation and publication of the excavations between 2007 and 2019.

The archaeological site of Hamadab lies within the fertile strip of the river Nile. (Photo: P. Wolf)

Musawwarat es-Sufra, Sudan – The archaeology of a ceremonial center of the Kingdom of Kush

CORNELIA KLEINITZ

Musawwarat es-Sufra is one of the best preserved and most intriguing monumental archaeological sites in Sudan. Due to its outstanding universal value, the valley of Musawwarat with its extensive ruins was inscribed in the UNESCO World Heritage List in 2011 as part of 'The Archaeological Sites of the Island of Meroe'. Musawwarat was an important ceremonial center of the Kingdom of Kush. Located away from the river in the arid hinterland of the Nile, the site was first built in the middle of the first millennium BCE, repeatedly modified and used until the fourth century CE.

The archaeological site comprises numerous – and in parts singular – built structures in a picturesque, roughly circular valley of about 3 km in diameter, which is surrounded by low table mountains and crossed by a temporary river course, the Wadi es-Sufra. Among its most prominent structures are the earliest known temple dedicated to the local lion-headed god Apedemak, the unique, labyrinth-like building complex of the Great Enclosure with its

View of the valley of Musawwarat from the West with the Great Enclosure in the foreground and the Great Hafir as well as the Apedemak or Lion Temple in the background (Photo: F. Stremke)

The Apedemak or Lion Temple of Musawwarat during the rainy season with the water of the Great Hafir in the foreground (Photo: C. Kleinitz)

temples, courtyards, corridors, rooms and ramps as well as the largest known artificial water reservoir of ancient Sudan, the Great Hafir. Such large-scale reservoirs collected rain as well as run-off water from temporary river courses and supplied Musawwarat with water for several months during and after the rainy season, providing a necessary basic resource for extensive construction and maintenance work as well as for hosting cult activities.

Most of the buildings visible today in the valley of Musawwarat date to the beginning of the Meroitic period of the Kingdom of Kush, which lasted from the third century BCE to the fourth century CE. This makes Musawwarat one of the few archaeological sites with well-preserved remains from the Early Meroitic period. During this transformative time, we see significant changes in various aspects of cultural expression in the Kingdom of Kush, among them religion, arts and architecture. Local or 'indigenous' facets of Kushite culture became more pronounced and visible. Manifestations of this shift are well-represented at Musawwarat. Here, we find early evidence of the inclusion of local gods into Kushite state religion, such as Apedemak and Sebiumeker. New architectural programs and (sometimes unique) solutions were developed for the construction of cult 'stages' during this time, with the Great Enclosure and the Apedemak Temple being prominent examples. Original themes were included in architectural decoration, such as elephant figures, which appear individually or in combination with lions in relief decoration and architectural sculpture. At the same time, a script was developed for the local Meroitic language, making it one of the first written languages of sub-Saharan Africa. Some of the earliest examples of this script are found among the graffiti

of Musawwarat, which comprise a rich corpus of texts and images from the Meroitic and later periods.

The site of Musawwarat has long been the subject of archaeological research under the auspices of Humboldt-Universität zu Berlin in cooperation with the Sudanese National Corporation for Antiquities and Museums (NCAM). In-depth surveys and excavations have been undertaken since 1960, accompanied by extensive conservation, restoration, maintenance and public presentation measures. A new 5-year research project headed by the author and based at the Commission for Archaeology of Non-European Cultures (KAAK) of the German Archaeological Institute (DAI) has been building on this work. It brings together diverse strands of evidence from field, archival and collections research with the aim of gaining a better understanding of the archaeology of cult at Musawwarat. These data are integrated into a newly developed Geographical Information System (GIS), which interrelates spatial data at the landscape, building and object levels. This also includes new field data on present land use and seasonality, which is being generated in close cooperation with the local pastoral community at Musawwarat. As today's environmental conditions do not appear to differ strongly from those of the Meroitic past, these new data can help us to better understand the ecological potentials and limitations that framed local pastoral lifeways as well as the construction and running of the ancient ceremonial site.

Meroitic culture has often been studied with reference to Egyptian, Graeco-Roman or Near Eastern influences. This DAI-KAAK project, in contrast, asks to what extent local or indigenous 'traditions' and practices as well as sensory cultures could have been reflected in concepts of space, aspects of visual culture or the (multi)sensorial bandwidth of cult prac-

Among the many sandstone walls of the Great Enclosure: View of a long corridor flanked by courtyards, with the Central Terrace and the columns of the Central Temple in the background (Photo: C. Kleinitz)

tices at Musawwarat. Various spatial and sensory choices will have influenced how building, supply, maintenance and ceremonial practices at the site were planned, experienced and remembered. These choices are reflected in the way the landscape was shaped and utilized or the various architectural structures in the valley were designed and used. Architectural solutions permitted, directed or restricted views and movement within and between the built structures, and utilized the interplay between light, shadow and darkness as well as between form and color. Materials that were employed in the building process as well as for making (cult-related) objects had specific visual, aural, haptic and olfactory properties, and they may have been selected for their range of sensory/experiential qualities. The soundscape of the valley of Musawwarat included natural and human-made sounds. It would have differed seasonally and according to occasion, depending if day-to-day activities took place or extraordinary events, like festivals with a large number of attendees. The sensory world of this ancient Kushite ceremonial center is currently being investigated through field studies and collections research. To gain a better understanding of some of the more mysterious facets of Meroitic culture this study is aided by the development of virtual 3D-reconstructions of some of the buildings that make it possible to simulate sensorial effects, which may once have been sought as part of the experience of cult at Musawwarat.

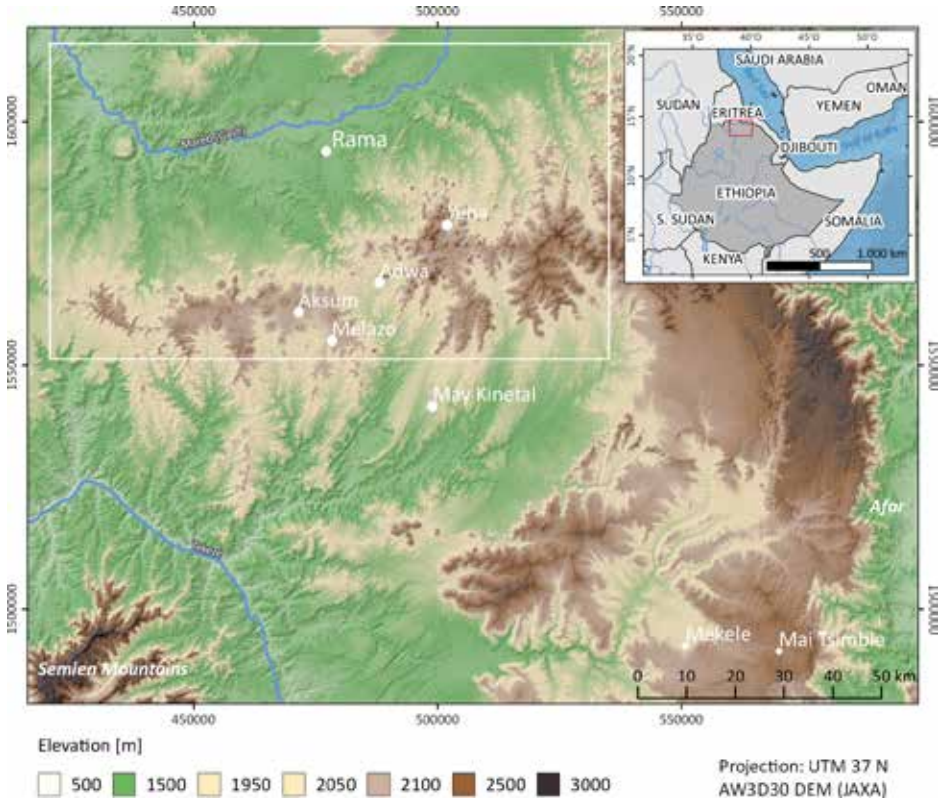
Top: A Meroitic cursive inscription calling on the god Apedemak as well as a life-like depiction of an elephant from among the graffiti of the Great Enclosure of Musawwarat. ***Left***: Architectural sculpture at the Great Enclosure of Musawwarat: A column base with a depiction of an elephant and a lion (Photos: C. Kleinitz)

Top: Exploring sensory properties of finds from Musawwarat in the Sudan Archaeological Collection & Archive at Humboldt-Universität zu Berlin: Translucent arrow head made from carnelian, which was found inside the Central Temple of the Great Enclosure. ***Right***: Investigating the soundscape of Musawwarat: Iron trumpet found in the vicinity of the altar in Temple IID (Photos: A. Minguito)

Routes of Interaction – Interregional contacts between the northern Horn of Africa and the Nile region

KRISTINA PFEIFFER / IRIS GERLACH / DIETRICH RAUE / BRIGITTA SCHÜTT / JACOB HARDT / CHRISTOPHER BRENINEK

The project "Routes of Interaction" is a collaboration between the Sanaa Branch of the Orient-Department, the Department of Earth Sciences – Physical Geography of the Freie Universität Berlin, and the Egyptian Museum – Georg Steindorff, Leipzig University. It has been carried out in close cooperation with the Authority for Research and Conservation of Cultural Heritage (ARCCH) in Addis Abeba, the Tigray Cultural and Tourism Bureau (TCTB) in Mekelle and the Ethiopian Institute of Technology, University of Mekelle. The project is embedded into



Topography and location of the Rama Valley, the border river Mareb/Gash and its tributary Midamar (Map: J. Hardt)

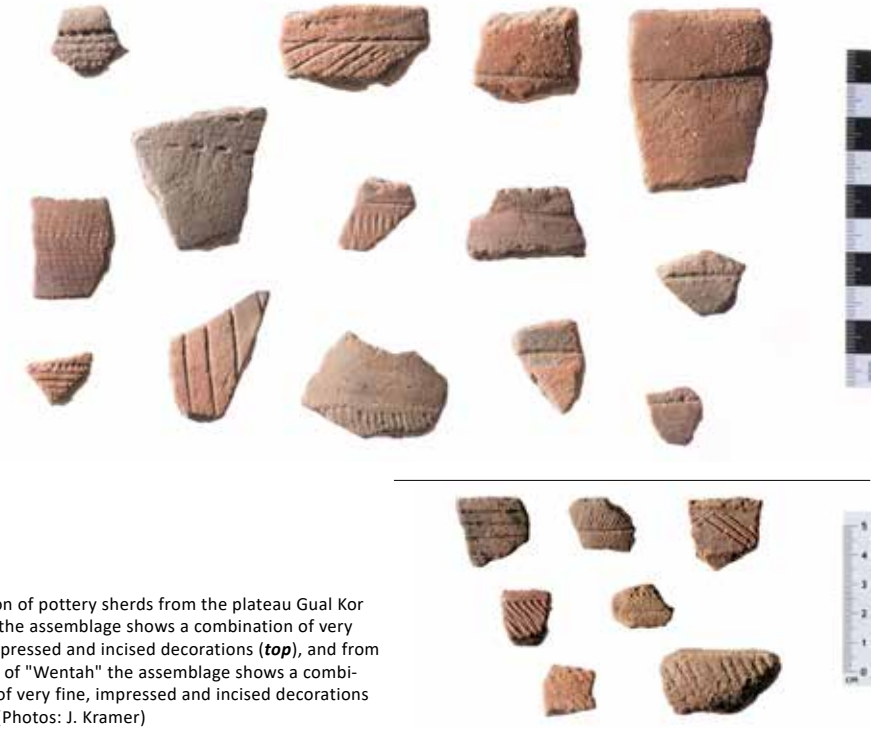
the SPP program "Entangled Africa" funded by the German Research Foundation (DFG). Fieldwork has been carried out since 2018.

The aim of the interdisciplinary project is to investigate various forms of mobility and routes of interaction between the highland cultures of the northern Horn of Africa and the cultures of the middle Nile River, the northeastern Sudanese Gash Delta as well as parts of Egypt. The objective is to clarify to what extent the intra-African exchange of populations, ideas and objects contributed to the development of Ethiopian highland cultures, and at the same time to ascertain the influence that the highlands had on the Sudanese-Egyptian Nile Valley and the Gash Delta. The chronological framework extends from the second to the early first millennium BCE. For this timespan transregional, intra-African contacts between the regions are attested in different categories of archaeological material as well as in Sudanese-Egyptian written sources. In addition, this period concurs with the beginning of the formation of complex societies in the northern Horn of Africa.

The prominent landmark "Wentah". A granite boulder formation at the main road to Rama (Photo: D. Raue)

It is well known that the cultures of the Sudanese and Egyptian Nile Valley developed an increasing demand for precious goods such as obsidian, gold, ivory, incense and furs of wild animals. Whereas the archaeological and epigraphic sources attest that these goods were imported to Egypt, the Gash region and eastern Sudan from at least the fourth millennium BCE onwards, it is generally unknown which goods reached the northern Horn of Africa in return and which routes were chosen for this interaction. The northern Horn of Africa was part of a network of mobility systems such as migration of peoples, trade and exchange. In order to reconstruct settlement patterns and communication routes in the Ethiopian highlands as well as in adjoining regions, surveys and soundings have been carried out in the Rama Valley. The Rama Valley is located in the Ethiopian-Eritrean border region and, due to its altitude of c. 1350 m, it is assumed to have been of significant geostrategic importance as a corridor between the Ethiopian highlands and the river Gash, which leads via the Sudanese lowlands to the Blue Nile River.

During recent field seasons, altogether 166 sites were recorded; the sites can be assigned to different time periods ranging between the second millennium BCE and 20th century CE. The prominent landmark site named "Wentah" consists of a granite boulder formation, located next to the main road between Rama and Adua. Pottery sherds that were found in the immediate vicinity of the boulder formation show a characteristic combination of very fine, impressed and incised decorations on rim and body sherds. Similar pottery decorations were frequently found in Sudan, where they can be dated between the late second and the middle of the first millennium BCE.



Selection of pottery sherds from the plateau Gual Kor Nebri, the assemblage shows a combination of very fine, impressed and incised decorations (***top***), and from the site of "Wentah" the assemblage shows a combination of very fine, impressed and incised decorations (***right***) (Photos: J. Kramer)

To the southwest of the modern village of Rama, the plateau site named "Gual Kor Nebri" is located on a diorite hill. Its position is near the northern fringe of the Rama area, which leads to the Mareb River (Sudan: Gash). During the survey, numerous pottery sherds were discovered that have impressed patterns on vessel body and rim and are comparable to those found at the site of Wentah. An excavation at the site of Gual Kor Nebri revealed potsherds, some of which showed similar decorations to those found on the surface. The combinations of incised and impressed decorations provide evidence for close parallels with the fine pottery of the so-called Gash culture of the second millennium BCE; the closest parallels can be found in the Kassala region in the eastern Sudanese lowlands.

At some sites zoomorphic figurines were found, which can be identified as bovines. Corresponding figurines are as yet unknown from the pre-Aksumite period in the Tigray and cannot be associated with local traditions so far. However, such figurines exist in Sudanese cultures of the second millennium BCE. Here, the diversity of the meaning of bovines is accompanied by a regular occurrence of such figurines in settlement contexts. There are no corresponding finds in Ethio-Sabaean assemblages, and neither can relationships nor similarities be discerned with regard to Aksumite or post-Aksumite types of finds.

The geographical survey focused on the field mapping of erosional landforms, which are mainly represented by gullies. Especially the interconnection between gullies and pathways are of interest, since pathways can induce linear surface erosion. Thus, the detection of gullies and gully heads can help to find ancient pathways. In addition, holloways were mapped and recorded: these paths have been used over a considerable time span and thus have eroded into the sediment and/or bedrock. The geographical investigations led to numerous insights into the connection between gully formation and pathway development. However, research on these way forms is supported by the application of various scientific methods of analysis to dating issues and is still in progress.

The fieldwork carried out in the Rama area not only provides insights into the use of the area as a settlement and transit space for the first time, but also into how the area was embedded in transregional networks. The geostrategically important location as well as the fertility of the valley and the natural conditions consolidate the favorable conditions. These certainly had an influence on the discovered evidence of sub-recent, Aksumite, pre-Aksumite and prehistoric features, which in turn speak for the characteristic long tradition lines in the Tigray region.

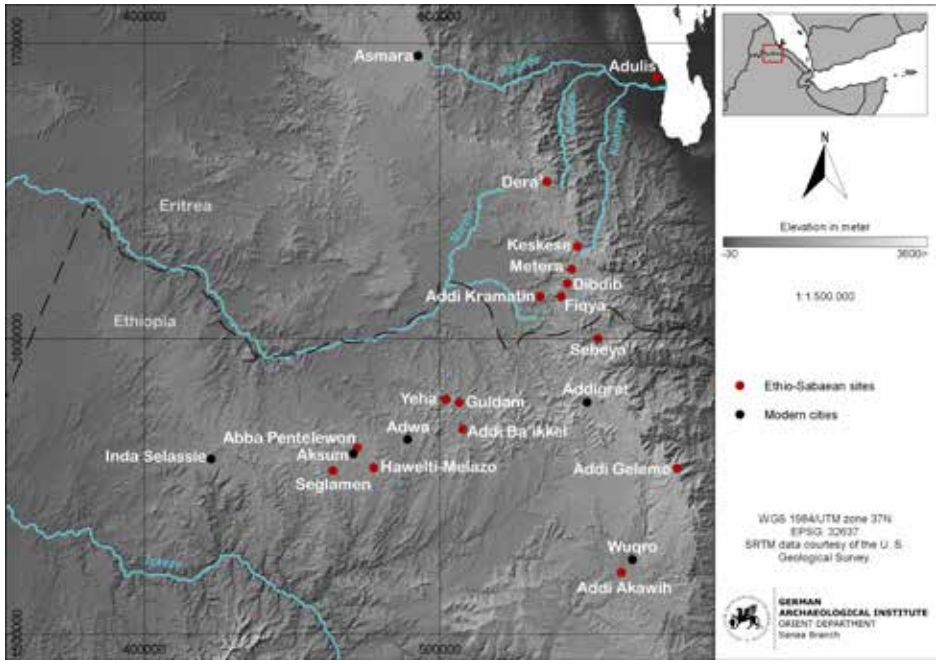
View along a holloway, which has been eroded down to the bedrock by pedestrian traffic (Photo: K. Pfeiffer)

Yeha – Centre of the Ethio-Sabaean polity (Tigray, Ethiopia)

IRIS GERLACH / SARAH JAPP / MIKE SCHNELLE / MULUGETA FESEHA

Research on the complex society that formed in the northern Horn of Africa in the early first millennium BCE as well as the intra- and non-African cultural contacts of the Ethiopian highlands is the focus of the Ethiopian-German joint projects of the Sanaa Branch of the Orient Department of the German Archaeological Institute and the Friedrich Schiller University Jena, which are being conducted in cooperation with the Authority for Research and Conservation of Cultural Heritage (ARCCH), the Tigrai Culture and Tourism Bureau (TCTB) and Addis Ababa University (AAU). Excavations at the sites of Yeha (DFG long-term project since 2016), Hawelti/Melazo and Wuqro have provided important insights into the culture of this region for the period from the end of the second millennium BCE to the first centuries CE.

The immigration of Sabaean groups from the heartland of Saba, around the ancient capital Marib (Yemen), into the Ethiopian highlands can be attested from the ninth century BCE onwards, at the latest. The expansion and control of exchange and trade relations were probably main motives for this migration process, along with climatic considerations. The favor-



Map of the Ethiopian-Eritrean highlands with Ethio-Sabaean sites (Map: V. Grünberg)

able environmental conditions including a more humid atmosphere than today, fertile soils, diverse resources for building and craft materials as well as local trade goods such as incense, gold and obsidian might have favored a long-term settlement strategy instead of one based on temporary contacts. The encounter between two hitherto independent cultures, the Sabaean and the indigenous African, led to the formation of a complex society and the so-called Ethio-Sabaean culture. The social and technical innovations of this time are far-reaching and affect, among other things, the structures of power and society as well as the religious-cultic life.

Within the new polity the site of Yeha, located 35 km beeline northeast of Aksum, developed into a political and religious center. Its function as a key site is underlined by extensive areas of settlement, several necropolises as well as monumental structures for administrative and religious activities.

It is assumed that there were four sanctuaries, three of which can be identified within today's church compound: The presumably oldest sanctuary, which could have been dedicated to the Sabaean deity ʿAṯtar, probably stood on the highest elevation of the site now covered by the modern church. Immediately to the south, King Waʿrān (7th century BCE), built the Great Temple of Yeha and dedicated it to the main Sabaean god ʾAlmaqah. On the western slope below this temple, surrounded by representative structures of hitherto undetermined function, excavations revealed the remains of another possible sanctuary. About 1400 m south of this sacred precinct, on a hillside with the field name Abiy Addi, stands the fourth temple, which could be identified as ʾAlmaqah-sanctuary.

The settlement policy measures of the Ethio-Sabaean rulers also included the construction of multi-storey buildings which had an administrative function, found so far in Yeha, Melazo and Wuqro. Analogous to representative buildings in South Arabia, it is assumed that the private living quarters of the Ethio-Sabaean rulers and their families were on the upper floors, while the more public ground floor was used to carry out administrative tasks and to store goods and valuable objects. The administrative building of Yeha (Grat Be'al Gibri) is one of the oldest structures of the Ethio-Sabaean period and already existed around 800 BCE. The huge complex with a pillar propylon can be reconstructed with a total height of about 40 m and a ground plan extending over 65 x 60 m. The up to 2.20 m wide walls were built of rubble stones, which were reinforced with horizontally laid wooden beams.

The Great Temple of Yeha, view from the west to the front façade (Photo: J. Kramer)

Aerial view of Yeha, in the center the church compound with the Great Temple and the red roof of the church is visible (Photo: K. Mechelke)

Around the mid-first millennium BCE, a conflagration destroyed the Grat Be´al Gibri as well as other representative buildings in Yeha and different Ethio-Sabaean settlements. The cause and historical background of this systematic, more or less simultaneous act of destruction are still unclear, but it marks the end of the Ethio-Sabaean polity.

Through surveys, geophysical prospections and excavations, it can be assumed that the ancient settlement area of Yeha comprised c. 30 ha. Sondages revealed rubble stone dwellings of the early Aksumite period (first to fourth century CE), which were probably built on older structures. The finds, such as common ware as well as numerous stone and clay implements, indicate a predominantly agrarian character of these domestic structures. Content analyses of vessels from the early first millennium BCE provide the first clues to the dietary habits of that time in Yeha. Thus, mainly plant-based foods were consumed. Furthermore, remnants of fermented fruit could be detected in locally produced vessels. If they turn out to be grapes, then this would be evidence of an early occurrence of wine in the northern Horn of Africa.

3-D print of the reconstructed palatial building of Yeha, the Grat Be'al Gibri with its monumental staircase, pillared propylon and multiple stories (Photo: M. Schnelle)

Aerial view over the fenced area of the necropolis of Abiy Addi towards Yeha (Photo: I. Wagner)

With the rise of Aksum as the center of the Aksumite kingdom and an increasing centralization, the settlement area decreased from the fifth century CE on and concentrated mainly on the former center of the Ethio-Sabaean settlement. This is directly related to the rededication of the Great Temple as a church in the sixth century.

In the ancient necropolises of Yeha, research is being conducted on the burial customs and the funerary cult. The tombs have up to 3 m deep shafts that were cut vertically into the rock. These led to chambers that were originally closed with stone slabs, in which the deceased were interred in collective burials.

In addition to scientific research, cultural preservation measures are also being implemented in Yeha: these include restoration work on the ancient buildings and the construction and establishment of an archaeological museum. Furthermore, various training components are carried out on site, such as teaching construction and restoration practices as well as training programs for lecturers and students of the Department of Archaeology and Heritage Management at Aksum University (AU).

Ethiopian-German research at the site of Wuqro/Tigray (Project phase II)

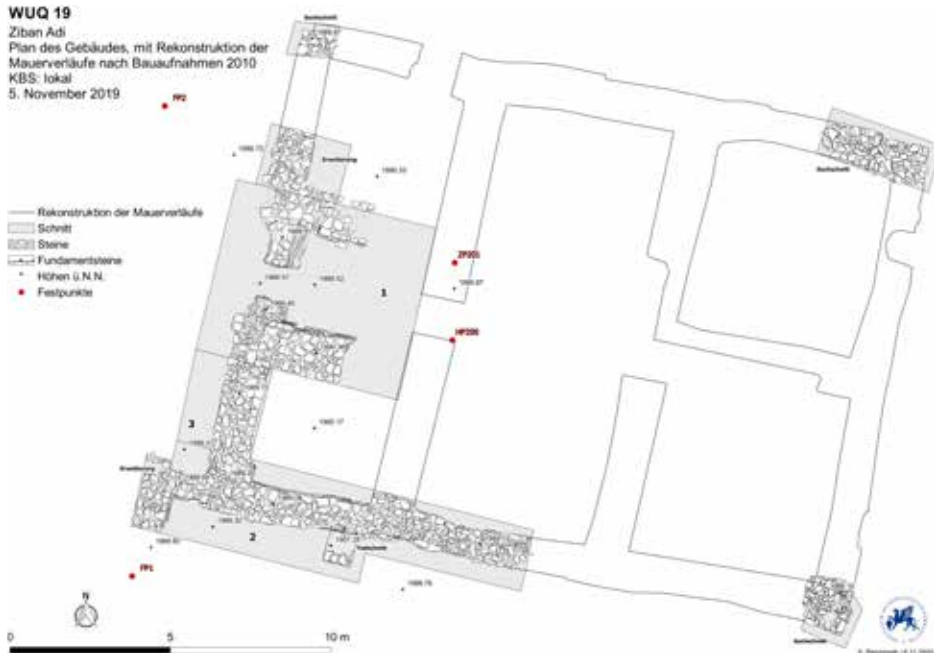
KRISTINA PFEIFFER / PAWEL WOLF / IRIS GERLACH / NORBERT NEBES

At the site of Meqaber Ga'ewa, the excavations unearthed parts of an Ethio-Sabaean sanctuary dedicated to the Sabaean god Almaqah. It was built in the eighth century BCE on top of an extensive predecessor building and was remodeled several times in the following four centuries. The remains of that multi-roomed predecessor, which had been destroyed by fire during the first centuries of the first millennium BCE, suggest that the site had already been in use for a longer period before the erection of the Almaqah temple. The elevated Almaqah temple was accessible via a large open stairway and comprised a completely preserved libation altar of Sabaean masonry, perfectly carved from limestone blocks, as well as

The Almaqah temple of Meqaber Ga'ewa protected by the shelter installed in 2012 – remains of the predecessor building (foreground left) as well as the replicas of the libation altar and other Sabaean cult objects in the main room of the temple (Photo: P. Wolf)

other cult objects such as limestone incense burners. The altar is inscribed with an Ethio-Sabaic votive inscription of King Wa'ran, which mentions that he had built the temple when the main sanctuary of Almaqah in Yeha, the center of the political community of Di'amat, was handed over to him. While these finds reveal close links with the kingdom of Saba in Yemen, the temple inventory is also associated with northeast African cultural traditions. This is demonstrated, for example, by the mention of the king's mother in his votive inscription as well as a limestone votive statue of a seated woman who might have been related to the royal family of Di'amat. In addition, the majority of the pottery assemblages recovered from the temple area place the sanctuary in the cultural context of the Tigraean highlands and other regions of the northern Horn of Africa.

Financial support from the German Foreign Office permitted the joint mission to establish a fully-roofed open-air museum at the site of the Almaqah temple, to restore the temple and to replace the altar and other cult inventory by high-quality replicas. Last but not least, the mission's activities contributed to the establishment of a large regional museum in 2014/2015; it was erected with the support of TCTB and the Berlin-based Society for the



Sketch plan showing the trenches and excavated building parts at Ziban Adi in 2019: Trench 1 at the entrance area, Trenches 2 and 3 at the western and southern outer walls and corners (Plan: S. Reichmuth based on Matthews/ Büchner 2016, 19)

Promotion of Museums in Ethiopia in the nearby town of Wuqro, where many of the finds are now on display.

During a preliminary reconnaissance survey in the area of Addi Akaweh, a residence building was recorded at the neighboring site of Ziban Adi in 2010. It was apparently the center of a larger settlement and resembles the Grat Be'al Gebri in Yeha. The radiocarbon age of charcoal samples retrieved from the debris of the building dates its construction to the first half of the first millennium BCE – contemporaneous to the Almaqah temple of Meqaber Ga'ewa. One sample, however, revealed a date in the late second millennium BCE indicating a much earlier settlement history in the region.

After the conclusion of the first project phase in 2015, research was continued from 2017 on with the financial support of the Gerda Henkel Foundation. At Ziban Adi, excavations were continued to study the characteristics of entrance constructions as well as the exterior facade design of Ethio-Sabaean monumental buildings in order to put them in typological and chronological relation with the findings at Yeha.

The residence building, which measures at least 20.5 by 15 m, revealed masonry made of wood-reinforced stone walls, exhibiting vertical and horizontal layers of beams. Massive

View towards the southern facade in the entrance of the monumental building of Ziban Adi (Photo: S. Reichmuth)

collapse debris, burned chunks of the characteristic mortar and charred beam remains indicate an enormous extent of fire-related damages, which Ziban Adi has in common with other Ethio-Sabaean buildings in Tigray. In addition, excavations to the west and southwest of the building show that the building had larger dimensions than previously thought.

The massive walls in the entrance area represent both the outer walls of the building and the inner sidewalls of the entrance. Both walls show vertical and horizontal beam bearings at the facades facing the entrance, as well as plaster remains. Between these two walls, narrow stone walls were erected to reduce the width of the formerly 3 m wide passage to 1 m – a construction detail also found at the Grat Be'al Gebri in Yeha. Adjacent to the narrowed entrance area, an elongated rectangular bronze artefact was found in the rubble – it could be a bolt for closing a door.

The pottery finds from Ziban Adi are very homogeneous and almost all pottery fragments originate from the destruction layers of the building. Black-topped ware sherds were found, as well as bowl fragments with zigzag and wavy bands below the rim on the inside, comparable to the finds from the Grat Be'al Gebri.

The joint Ethiopian-German research activities at Wuqro show that the region of Addi Akaweh represents an archaeological landscape with sacral and monumental buildings, but also domestic residential areas of the Ethio-Sabaean period. However, the civil war that broke out in Tigray in November 2020 led to an interruption of our fieldwork. Numerous sites and finds could not be secured and some were severely damaged and looted during the war. Unfortunately, extensive destruction was also documented at the temple complex of Meqaber Ga'ewa, at the replicas of its cult inventory, and in the storage building of the excavations.

Left: Black-topped ware, bowl. ***Top***: Bronze bar found at Ziban Adi, Trench I (Photo: H. Hamel)

Statue of a seated woman with a votive inscription dedicated to Almaqah – Inscription: "Almaqah, that he may grant the blessing of offspring" (translation by N. Nebes) exhibited in the museum of Wuqro (Photo: P. Wolf)


Southern Africa

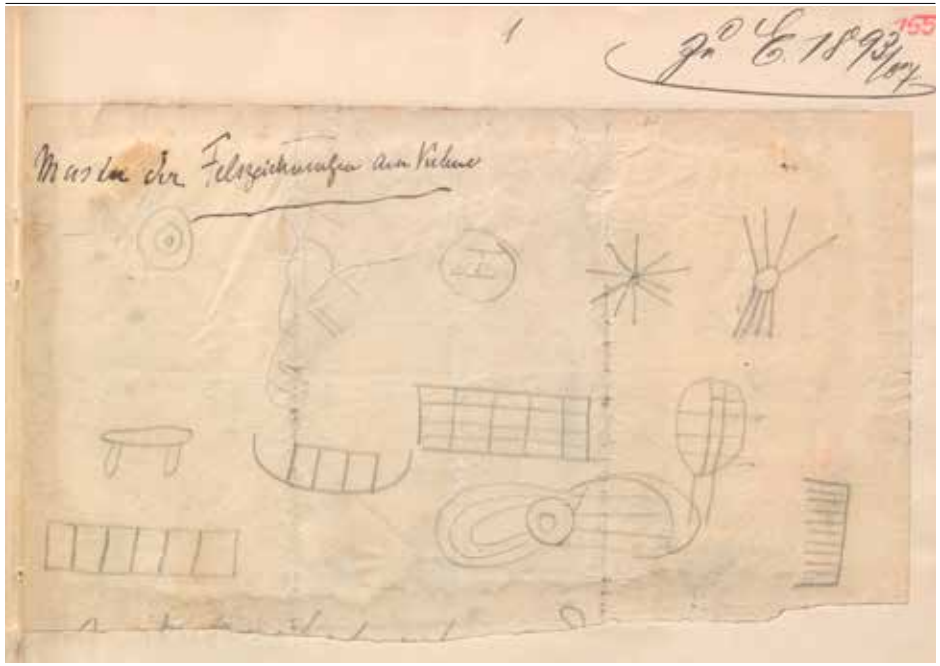
Archaeology, colonialism and museum collections – The archaeological material from Chifumbaze (Mozambique) in a collection of the Ethnological Museum Berlin

KATHRIN LOGES / DÉCIO MUIANGA / JÖRG LINSTÄDTER

Among the many objects stored in the depot of the Ethnological Museum in Berlin (*Ethnologisches Museum Berlin*) is an assemblage consisting of stone tools such as flakes, stones grindstones, anvils and perforated globular objects, presumably weights for digging sticks, and Early Iron Age evidence as well as some pottery, which is mostly in sherds. Excavated in rural Mozambique sometime between 1905 and 1909, these artefacts are still of interest for modern-day archaeological research. The material is first excavated Early Iron Age (today: Early Farming Communities) assemblage of the region and is eponymous for the so-called "Chifumbaze complex" (named by David Phillipson 1976, that also studied the collection in the 1970s). Thanks to the staff of the Ethnological Museum Berlin, the authors had the opportunity to study the material in November 2020 despite the worldwide pandemic.

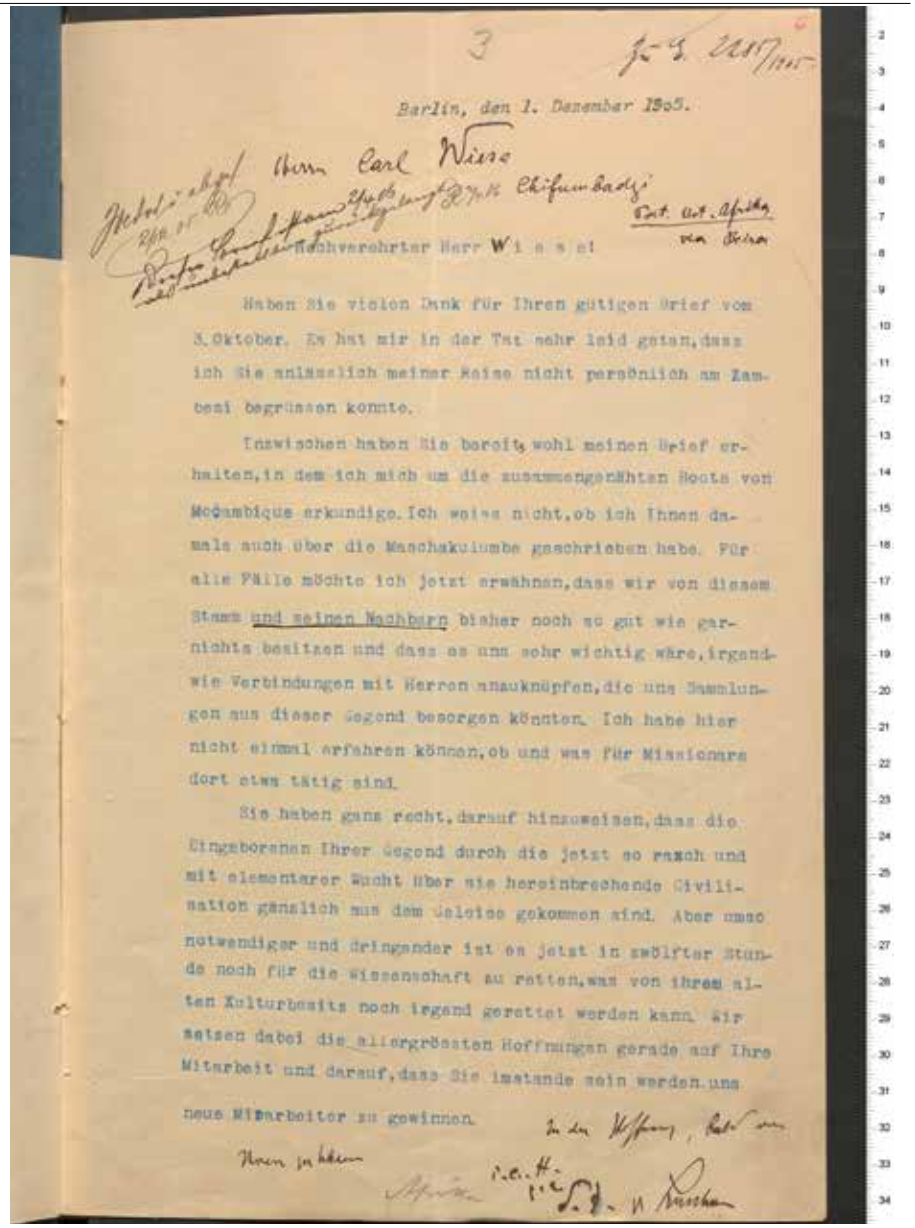
Yet the circumstances under which they were originally discovered pose an additional challenge for several reasons. Therefore, an interdisciplinary approach is necessary, incorporating provenience research, to examine the historic background of artefacts' way to Berlin. The stone tools and pottery are part of a larger collection that was presented to the

Décio Muianga drawing pottery sherds from the Wiese Collection at the depot of the Ethnologisches Museum in Berlin in November 2020 (Photo: J. Linstädter)



A sketch of the rock paintings accompanying the letter in which Carl Wiese first tells Felix von Luschan about the discovery he has made near the Chifumbaze Complex in Mozambique (Photo: SMB-ZK, I/MV 0741, 155)

Museum, back then known as the Royal Museum of Ethnography (*Königliches Museum für Völkerkunde*), over the course of a decade by a German merchant named Carl Wiese. In late 1900, Wiese had started sending ethnographic objects from British Central Africa and Portuguese East Africa, nowadays Mozambique, Malawi and Zambia. This collection, though just as little known as its collector, presents an opportunity to exemplarily analyze the connections between archaeology, colonial structures, and Europe's Museum collections in the early 20th century. Studying the files documenting the acquisition of the Wiese Collection provides an insight into the complex social structures that enabled the Ethnological Museum to build its vast collections of objects from all over the world. Letters passed between Carl Wiese and Felix von Luschan, Director of the Ethnological Museum's Africa and Oceania Department at the time, tell a story of scientific fascination deeply influenced by colonial mindsets. There is little information on the person of Carl Wiese. Yet, his work under British and Portuguese colonial rule while maintaining close relationships with indigenous peoples and his bestowals on the Ethnological Museum represents the transnational connections and ways of knowledge transfer that turned out to be by-products of imperialism. Felix von Luschan on the other hand remains a relatively well-known figure to this day. Though in his letters, Luschan expresses some awareness of the destructive impact the expansion of European "civilization"



Berlin, den 1. Dezember 1905.

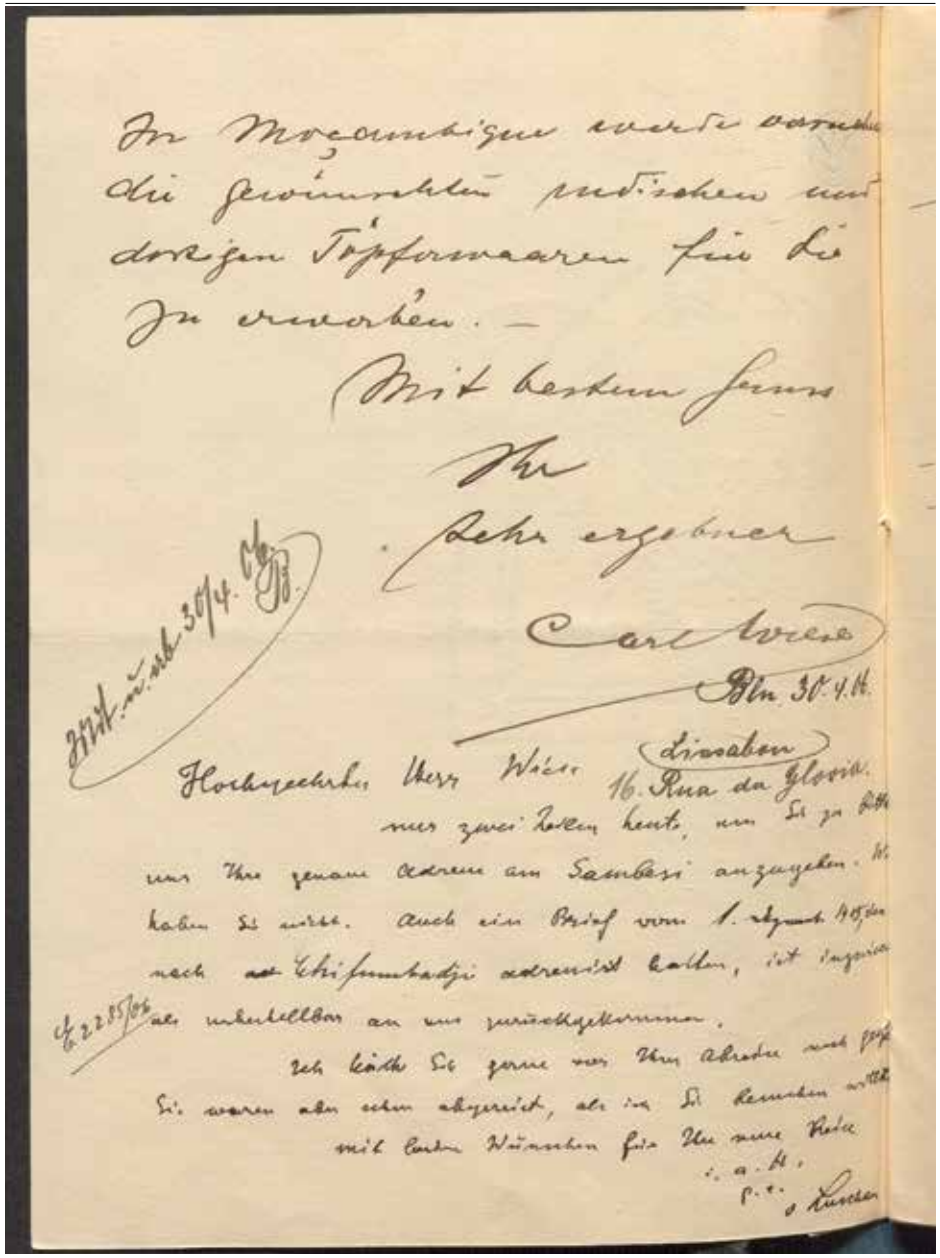
Hochverehrter Herr W i e s e !

Haben Sie vielen Dank für Ihren gütigen Brief vom 3. Oktober. Es hat mir in der Tat sehr leid getan, dass ich Sie anlässlich meiner Reise nicht persönlich am Zambesi begrüssen konnte.

Inzwischen haben Sie bereits wohl meinen Brief erhalten, in dem ich mich um die zusammengenähten Boote von Mocambique erkundige. Ich weiss nicht, ob ich Ihnen damals auch über die Maschakulumbe geschrieben habe. Für alle Fälle möchte ich jetzt erwähnen, dass wir von diesem Stamm und seinen Nachbarn bisher noch so gut wie garnichts besitzen und dass es uns sehr wichtig wäre, irgendwie Verbindungen mit Herren anzuknüpfen, die uns Sammlungen aus dieser Gegend besorgen könnten. Ich habe hier nicht einmal erfahren können, ob und was für Missionare dort etwa tätig sind.

Sie haben ganz recht, darauf hinzuweisen, dass die Eingeborenen Ihrer Gegend durch die jetzt so rasch und mit elementarer Wucht über sie hereinbrechende Civilisation gänzlich aus dem Geleise gekommen sind. Aber umso notwendiger und dringender ist es jetzt in zwölfter Stunde noch für die Wissenschaft zu retten, was von ihrem alten Kulturbesitz noch irgend gerettet werden kann. Wir setzen dabei die allergrössten Hoffnungen gerade auf Ihre Mitarbeit und darauf, dass Sie imstande sein werden, uns neue Mitarbeiter zu gewinnen.

Felix von Luschan's typewritten reply to Carl Wiese, dated December 1st, 1905, expressing hope that Wiese will join his efforts of preserving the cultural heritage of Mozambique's indigenous peoples in the Museum (Photo: SMB-ZK, I/MV 0735, 6)

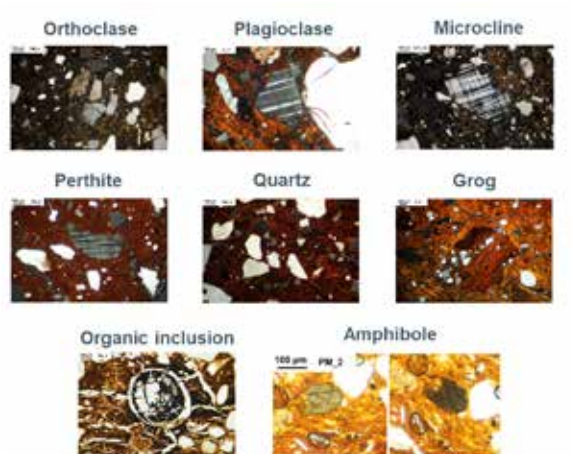


A handwritten letter by Wiese closing with a promise to purchase several pieces of pottery in Mozambique. Below, a draft of Luschan's reply, in which he asks for a more detailed address at the Zambesi (Photo: SMB-ZK, I/MV 0737,7)

through imperialism and colonialism had on cultures all over the African continent, his main interest was clearly expanding the collection of East-African ethnographica in his department. When Wiese wrote to Luschan in 1905 telling him about rock paintings he encountered near the gold mining complex of Chifumbaze, in central Mozambique, Luschan apparently did not share Wiese's excitement. Wiese was sure that the rock art he discovered dated back to "Solomonic times" and he hoped further investigation of the site could lead to new insights into the earliest population developments in the area. Luschan's lack of excitement for his discovery apparently disappointed Wiese and even though he was advised against it, he started excavating underneath the rock paintings at Chifumbaze. Always stressing that he himself was not a scientist, Wiese documented his excavation very poorly. His conviction that he came across quite an important archaeological site at Chifumbaze led to a disagreement with the Museum Director, since the two men disagreed on the significance of the findings. Luschan considered them to be of little or no significance and he reminded Wiese that sites such as the one at Chifumbaze could probably be found all over the continent - what in his eyes diminished its importance. Wiese on the other hand was quite convinced that he was doing a genuinely good thing and would ultimately promote scientific interest in the research of the development of earlier populations in the region. The sherds and stone tools never made it into the Museum's permanent exhibition. Over the years Wiese had sent hundreds of objects from Portuguese East Africa and British Central Africa to the museum. He even tried to collect according to the museum director's wishes – trying to acquire objects from specific regions or peoples. Apparently, he never received any monetary compensation for his efforts. Only the archaeological material he was unwilling to donate to the Ethnological Museum. Upon learning of Wiese's death von Luschan informed his successor as head of the Africa and Oceania department that the Chifumbaze objects were still stored in the Museum's depot – but he referred to them as "mostly worthless" and stated that they originated from an "excavation" near Tete. Some stones were passed on to the Museum of Mineralogy as it seems, the rest went over into the Museums possession. The assemblage remained mostly forgotten, but except for a few pieces, intact. Wiese's original letters and the many drafts for Luschan's replies preserved in the Museum's files provide additional information about the whereabouts of items sent by Wiese, lost and misplaced shipments and inquiries sent to other museums. In the years between 1900 and 1909 Wiese apparently stopped by the museum to meet with Luschan at least once a year to give more detailed accounts of the objects' origins. Luschan passed objects that were not needed or wanted by the Ethnological Museum on to other institutions like the ethnological collection established by Carl Graf Linden in Stuttgart or the Royal Museum of Natural History in Berlin. The complexity of networks of a museum landscape that actively participated in and extensively made use of colonial structures to grow the collections becomes clearly visible in the process of working with the documentation of the Wiese Collection.

Bantu arrival in southern Africa – Ceramic archeometry and geophysical prospection in southern Mozambique

SABRINA STEMPFLE / DÉCIO MUIANGA / JÖRG LINSTÄDTER / MARTINA SEIFERT / NIKOLA BABUCIC



Left: Typical inclusions in Matola pottery of the project under a polarizing microscope (Figure: S. Stempfle). ***Right***: Examples of the Matola-Pottery from Changalane 11 (Photo: J. Linstädter)

Pottery first appeared in Africa around 10,000 years ago and is recognized in the literature as a technical innovation by hunter-gatherers and fishermen in the southern Sahara. Meanwhile, the introduction of pottery in southern Africa is associated with the immigration of the first farmers and herders, the so-called Bantu, around 2000 years ago. Even today the Bantu expansion can be seen ethnographically. According to recent studies, there are today over 500 Bantu languages spoken by about 310 million people in 23 African countries.

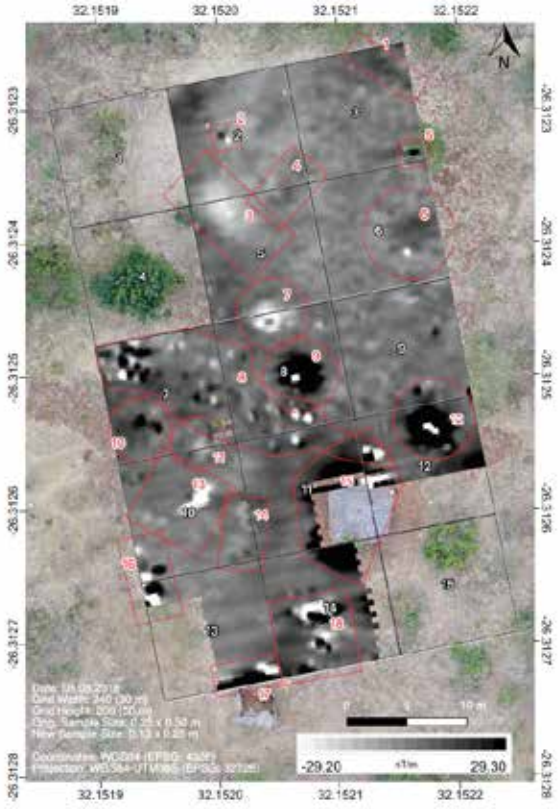
The origin of the Bantu is assumed to be on the border between today's Nigeria and Cameroon. The separation of the Bantu from their closest relatives, the proto-Bantu, was a long and steady process that began in the fifth millennium BCE, in the grasslands of northwestern Cameroon. Roughly around the same time and place, pottery makes its first appearance at the Shum Laka Rock Shelter. However, not before the third millennium BCE, the use of ceramics became prevalent.

The following Bantu expansion can be divided into two phases: The first phase is a slow, 200 km long, southern-orientated expansion dated in the second half of the second millennium BCE towards the region of today's capital Yaoundé in Cameroon. The second phase

followed shortly after and at a much more rapid pace. From the middle of the first millennium BCE onwards, settlements appear in west-central Africa, which are characterized by large waste pits, pottery, polished stone tools such as axes and hoes, a less developed stone industry and remains of oil palms and African canarium.

This more rapid inland expansion of the Bantu during the mid-first millennium BCE coincides with the beginning of metallurgy in Central Africa around 800 BCE and started to spread from here on from north to south. Shortly thereafter, the first archaeological evidence of food production can be found in Central Africa. A little more than 2000 years ago, the typical Bantu attributed package of domestic animals, tropical African crops, iron and ceramic technology was formed and reached the areas of southern Africa around the first century CE.

Summarized is therefore assumed, that Bantu speaking groups moved around 4,000 km between Central Cameroon and South Africa in less than 2,000 years. Due to the vastness, the mostly longitudinal orientation and the rapidness, the Bantu expansion has challenged researchers from a wide variety of disciplines and while it is still fascinating, it leaves many unanswered questions. Research gaps in archaeological reconstruction, as well as new dating results, the appearance of bones of domesticated animals and of distinct pottery in hunter-gatherer contexts, continue to challenge this Bantu model.



Results of the geophysical prospection from the site Changalane 54 in Mozambique (Figure: J. Welte)

As a working area the Changalane province in southern Mozambique was chosen. On the territory of todays South Africa, intensive research on Early Farming Communities was undertaken. All early assemblages are seen as developments out of a north-eastern influence represented of the so-called Matola pottery named after a site near Maputo. In South Africa itself, sites of this very early period are not documented yet. In contrast southern Mozambique offers several sites belonging to that period such as University campus Maputo or Zitundo at the very south close to the South African Border. In the course of further surveys of researchers from Eduardo Mondlane University Maputo and Uppsala University, sites providing Matola pottery were detected in the Changalane area southwest of Maputo near to the boarder to Eswatini.

Therefore in 2016, a research cooperation between the Eduardo Mondlane University and the German Archaeological Institute was started. Since then, this cooperation performed further surveys as well as geomagnetic prospection in Changalane province. In cooperation with the University of Hamburg and the Uppsala University a dedicated research project was developed, which is focused on geomagnetic prospection and archeometric analysis of pottery.

In 2018, a first geomagnetic prospection was performed at an open-air site near the famous Daimane shelter near Changalane. The detected 18 magnetic anomalies include two rounded features which are interpreted as possible huts or kilns. The general lack of comparative studies makes a verification by other geophysical methods and archaeological excavation necessary. In consequence, a cooperation with the University of Hamburg for geophysical

Field survey in Changalane in 2019 (Photo: D. Muianga)

prospection was established to conduct comprehensive geophysical surveys in the research area in Mozambique. The recording of magnetic variations and electromagnetic signal responses may help to indicate further pit-houses, pottery fields and kilns in the context of Early Farming Communities. The results will reveal further excavation sites, which in return allow confirming the geophysical results.

Petrographic and geochemical analysis at the University of Hamburg are performed to get information about the manufacturing process and the raw material used and to get new dating results. First results indicate differences in decoration and raw material choices between the different sites and regions in the research area. The combined results about the diversity in raw materials, techniques and use within the Matola-Pottery will help to test the Bantu model and to investigate the beginning of pottery production in southern Africa.

Left: Survey at the Daimane Shelter in 2019 (Photo: J. Linstädter). ***Top***: Sample selection at the Universidade Eduardo Mondlane in Maputo in 2019 (Photo: H. Heltorff)

The first field seasons involved surveying the country and documenting sites. As much information was gathered and then entered into the database. This shelter revealed artefacts from the Stone Age (Photo: J. Linstädter)

The Land of the Ochre – Developing heritage infrastructure and archaeological research in Eswatini

LISA COIT EHLERS / TEMAHLUBI DUDU NKAMBULE / BOB FORRESTER / BRANDI MACDONALD / ELIZABETH VELLIKY / GREGOR BADER / JÖRG LINSTÄDTER

Eswatini, formerly known as Swaziland, is located in the eastern part of southern Africa, landlocked by South Africa and Mozambique. With an area of 17,363 km², Eswatini is one of the smallest nations on the continental mainland. Despite its size the country is endowed with a rich history coupled to a very strong environmental diversity.

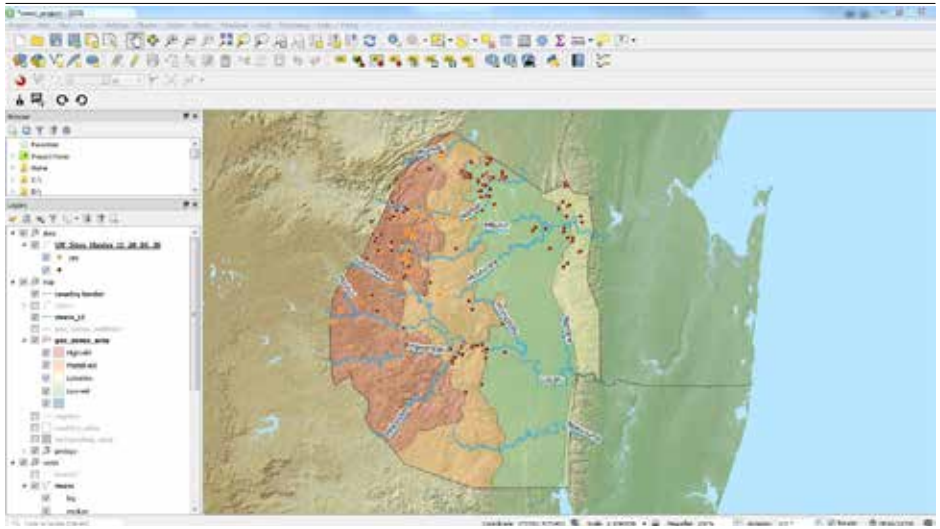
The German Archaeological Institute was first introduced to Eswatini in 2016 when it was brought to our attention that no extensive archaeological research had been conducted in the country for nearly 30 years. We were immediately struck by the research potential and archaeological wealth yet to be revealed. In collaboration with the Eswatini National Trust Commission (ENTC), a governmental parastatal, responsible for the country's cultural heritage, we formed an international team using multidisciplinary approaches and initiated a project to better understand to developments of Eswatini's past.

The first field seasons were dedicated to surveying the country in search of research opportunities and obtaining a comprehensive overview of the current state of research. The latter entailed screening the entire collection of artifacts stored at the National Museum of Eswatini. The majority of remains were retrieved during the 1970s and 80s during which

the Swaziland Archaeological Research Association (SARA) was active. We picked up where the SARA left off in 1989 and were confronted with an immense amount of archaeological remains, partially yet to be processed. All artifacts were repacked, relabeled and counted in order create a complete digital inventory and finally placed in a new storeroom with easy access for future research. As a final initial step we constructed a database and integrated it into a Geographical Information System (GIS) ultimately forming the basis for a national register to ensure the protection of the cultural heritage of Eswatini. Up to now 280 sites ranging from Early Stone Age to the remains of contemporary farming communities are documented. This basis will also allow us to study changes of settlement patterns on spatial and temporal levels.

Once the groundwork was laid we were ready to take the next steps and select a research site. We were especially intrigued by Lion Cavern. The site is located on the southern flank of the Ngwenya massif near the South African border. Initially excavated and radiocarbon dated in the 1960s, the site is considered one of the oldest ochre mines in the world, dating to 43000 BP. The area can therefore look back on a long history of mining – in recent years being extensively exploited for its rich ore deposit. Where a mountain once stood is today a crater slowly filling with water. Our project, funded by the German Research Foundation (BA 6479/2-1) since 2019, is focused on the reinvestigation of the Lion Cavern using state-of-the-art excavation and dating methods. Using Optically Stimulated Luminescence (OSL), we were able to verify its spectacular age. Beyond that, we are conducting provenance analysis in order to infer mobility and exchange patterns. This consists of large-scale geological surveys

Archival work at the Eswatini National Trust Commission. All artefacts were relabeled and repacked and entered into the database (Photo: L. Ehlers)



Excerpt of GIS and distribution of archaeological sites throughout the country (Map: L. Ehlers)

View of Lion Cavern and the remains of the mountain after extensive mining at Ngwenya. Climbers and archaeologists work together to take OSL samples in order to redate one of the oldest ochre mines thus far known (Photo: B. MacDonald)

in order to identify outcrops of earth pigments and their subsequent geochemical analysis as well as that on various rock art sites and the archaeological pigment material stored at the archive. Comparative analysis has confirmed the use of ochre mined at Lion Cavern and the Ngwenya massif during the Stone Age periods and has indicated transport and exchange throughout the country.

In order to obtain a complete picture of the Eswatini's past, future objectives intend to shed light onto the developments during the arrival of the iron-working sedentary farmers. Throughout southern Africa, interest in this time period seems to be dissimilar. While in some countries extensive research has been conducted on the farming communities, it has been completely omitted in others. In Eswatini, there is currently only one PhD that has focused on these farming communities. With further research, we can obtain a better idea of their settlement patterns over time and space and hence enhance the scientific community to better understand the migration patterns of these later periods.

As additional support, we are currently working together with the University of Eswatini (UNESWA) and taking first steps to integrate an archaeology study program into the curricula. At the moment students who would like to pursue a degree in archaeology need to do this outside of the country. A study program in this field directly at their home university would help create a greater pool of next-generation archaeologists and hence further ensure the protection of Eswatini's cultural heritage.

Conducting XRF analysis to determine the elemental composition of the rock art at a Late Stone Age site (Photo: L. Ehlers)

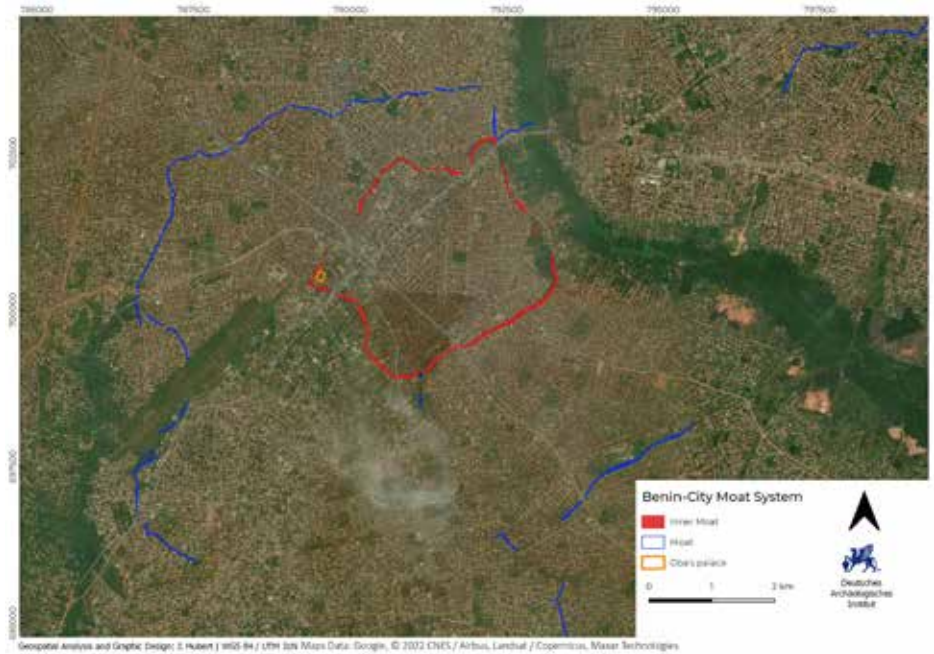
Western Africa and Sahara

The future Archaeology Study Center and researching the past of Benin City

CHRISTIAN SCHEPERS / CALEB ADEBAYO FOLORUNSO / SOFIA FONSECA / CHRISTIAN HARTL-REITER / JAN HUBERT / OLUSEGUN OPADEJI / CHARLES LE QUESNE / JÖRG LINSTÄDTER

The edo|cation project, funded by the Federal Foreign Office of Germany and directed by the Commission for Non-European Archaeology (KAAK) of the German Archaeological Institute (DAI), supports the establishment of an Archaeology Study Center within the framework of the planned Edo Museum of West African Art (EMOWAA) in Benin City, Nigeria.

Benin City in Edo State of Nigeria was the capital of the Kingdom of Benin from the first millennium CE until 1897 and is well known for its precious artwork, the so-called Benin bronzes. In 1897 British colonial troops destroyed and looted Benin City. Today thousands of the bronzes are scattered in museums around the World. After decades of negotiations,

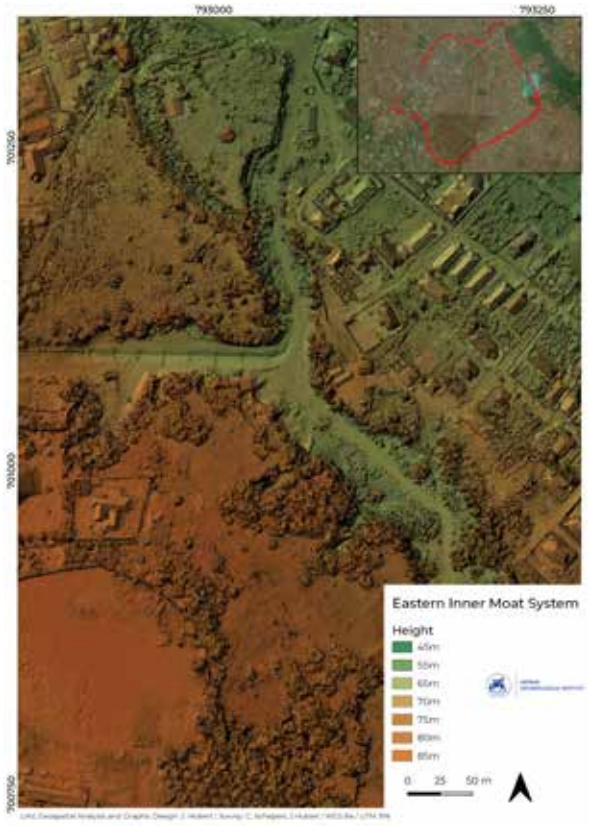


Map of Moats and Ramparts in Benin City (Map: J. Hubert)

some museums are starting a restitution process. The EMOWAA will host most of the Benin Bronzes and therefore make them available for the Nigerian Public. As important part of the EMOWAA the Study Center will build capacities within Nigerian archaeology, conservation and museums.

Less known than the Benin Bronzes are the extensive rampart and moat systems called "Iya". Around 1440 CE the Oba Ewuare extended the kingdom from a city-state to the surrounding land and ordered the construction of further Iya. All moats and ramparts together span a length of more than circa 16000 kilometers. Even as such extensive monuments the moats and ramparts are under threat by urban and industrial development such as quarrying for clay or power plant construction. As such massive archaeological features and historical witnesses of the former Kingdom of Benin the Iya are not only important Nigerian heritage but important world heritage.

The hierarchically stratified society of the Kingdom of Benin is visible in the spatial structures of the capital. The Oba as ruler of the kingdom separates himself from the city by the inner Iya. The outer Iya separates the city, the center from the hinterland, the periphery. Within the outer Iya craft specialization such as the guild of the bronze casters defines city quarters. Elders, the chiefs live in outstanding palaces. Dozens of rooms and patios structure the floor plan of the palaces into personal living areas of the chief, functional places and rooms where the chief receives his clients. Common houses and palaces alike stand for extended networks and families that need space and architectural frag-



DEM of the eastern inner moat and rampart affected by gully erosion, construction work and agriculture (Map: J. Hubert)

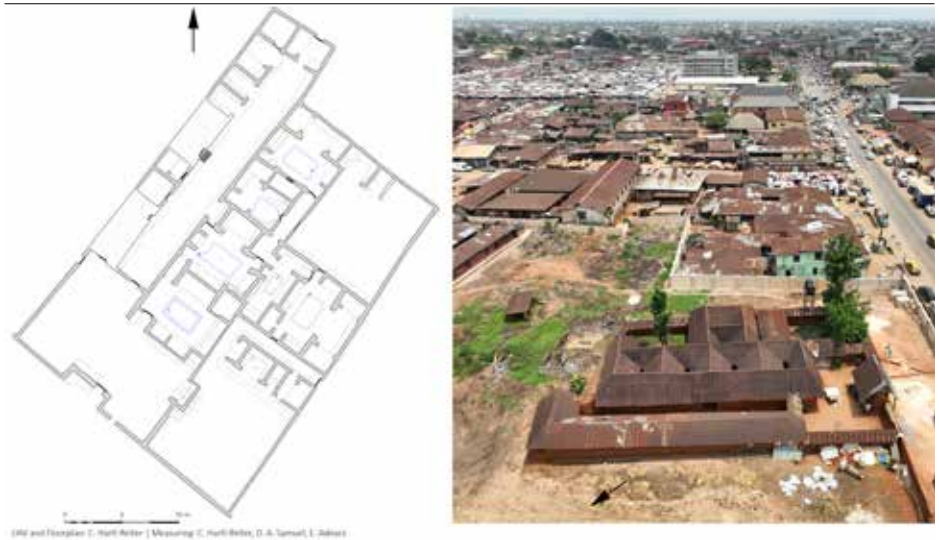
Survey team around moats and ramparts (Photo: C. Schepers)

mentation. The British invasion of 1897 and colonial planning destroyed most parts of this spatial structure, but remnants are still visible. The present palace of the Oba for example is smaller than the palace from before the invasion. Therefore, it is important to document these remnants to reconstruct the socio-economic system of historical Benin City.

The comprehensive study and documentation of the ramparts and moats is one main research topic of the edo|cation project. Former research from the 1960s until now already resulted in maps, plans and interpretations of the Iya system. To document the system former researchers used analogue instruments and countless hours of surveying on foot. Now in 2022 edo|cation investigates the ramparts and moats with state-of-the-art digital archaeological methods. This includes remote sensing, airborne 3D photogrammetry and laser scanning using drones, measurements with a Differential Global Positioning System and a cloud based mobile geographic information system with real-time updates. The cloud based geographic information system can accessed directly in the field via any mobile android device. With the digital methods edo|cation can refine results from past analogue research and offer new perspectives on the Iya of Benin.

In March 2022 edo|cation documented the Ogiamien Palace, the oldest house in Benin using structure from motion (SFM) technique.

Special software combines thousands of pictures to a 3D model of the palace. Control points measured with total station and GPS enable georeferencing the 3D model with an accuracy in the millimeter range. The 3D model is the base for a floor plan and cross sections. It helps to assess the preservation of the house and to plan conservation work.



Floorplan of Ogiamien Palace based on photogrammetry (***left***) and aerial view of the historical palace within the modern city (***right***) (Map and Photo: C. Hartl-Reiter)

The 3D modeling of Ogiamien Palace could be a template for the documentation of other monuments.

During the same campaign parts of the moats and ramparts were mapped on satellite images followed by ground truthing. Older maps show the whole extent but are less exact than plans on the base of GPS and airborne 3D photogrammetry with drones. Where airborne 3D photogrammetry is not feasible because of dense vegetation in a next step airborne laser scanning will complete the mapping of the ramparts and moats. Comparing the new results from the digital map with analogue maps makes it possible to assess how the preservation of the ramparts and moats changed within the last six decades. The digital mapping of the Iya will aid heritage management and enable new perspectives on the urban structures of historical Benin City and the connection to the hinterland.

Capacity building is one of the main pillars of the DAI worldwide. During edo|cation a structure of training and knowledge exchange will be developed for archaeology graduates from the University of Ibadan, from other universities and young heritage experts from the National Commission for Museums and Monuments with a research focus in digital Archaeology. As part of this structure an online platform with courses and supporting online materials will be created. Close cooperation with Nigerian partners is important to assess the needs and requirements of a Nigerian team conducting international research and teaching generations of future archaeologists in the Study Center.

Lake Yoa, a groundwater-fed permanent lake in the Ounianga basin, northern Chad. Sediments retrieved by coring out of this lake cover the last almost 11000 years (Photo: G. Steinmetz)

DeGree: 'De-Greening' of the central Sahara – Northern Sahel – Environmental dynamics and oases economies

MICHÈLE DINIES / PHILIPP HOELZMANN

During the Early Holocene the central Sahara re-greened. The 'Green Sahara' offered a large range of subsistence possibilities and facilitated migration and exchange during the Middle Holocene. The subsequent retreat of the savanna necessitated adaptation. Mountainous regions and oases play a crucial role as refuges, from where propagation set on when ecological conditions become favorable again.

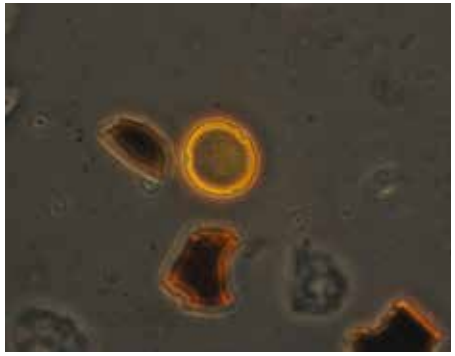
Environmental variability thus represents both, an important limiting factor as well as a driving force for inner-African contacts and strategies of human societies and their mobility patterns.

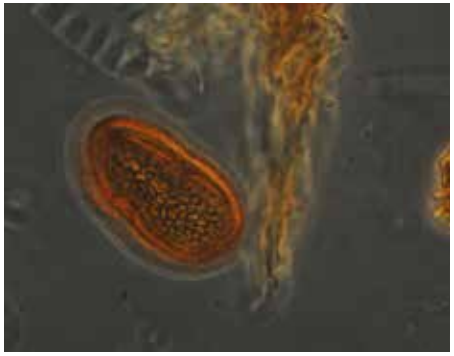
As part of the DFG- Priority Program 'Entangled Africa', the 'DeGree' project aims at compiling a palaeo-ecological framework for the Holocene for the Central Sahara and Northern Sahel.

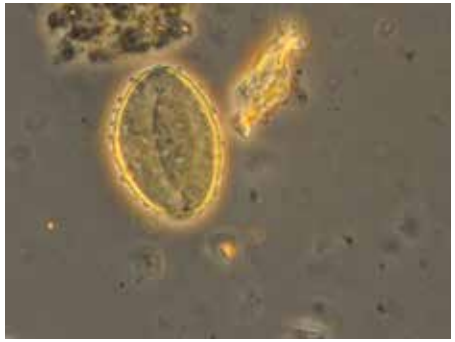
We focus on the study of pollen types preserved in sedimentary archives from Lake Yoa and other lake deposits. Sediment samples at intervals of about every 70 years were prepared and analyzed. More than 150 different pollen types have been identified, representing different plant taxa, either a few taxa or larger groups (genus to subfamilies). The evaluation of the

entirety of the pollen spectra will allow – together with the compiled published other palynological records – to establish a chronological framework of palaeoenvironmental changes and variations in oases economies.

However, the look at selected pollen types and their occurrence over time already provides evidence of changes in landscapes triggered by either climate variability or land use. For example, major frequencies of Hackberry pollen, representing *Celtis* with its Sudanian and Guineo-Congolian phytoaffinities, are restricted to the period between circa 6000 – 3500 BCE, indicating the wettest conditions during the Holocene. *Grewia*-type pollen in contrast, are recorded consistently during the seventh and eighth millennia BCE and again during the fourth millennium BCE, indicating a transitory period during the re-greening and de-greening of the Ounianga basin (N-Chad). Today, *Grewia* is present only in the bordering mountains of Tibesti and Ennedi. Finally, the sporadic evidence of *Hyphaene*-type pollen during the Holocene indicates suitable growing sites also during the "Green Sahara" for this drought-adapted palm. The distinct increase during the last circa 2000 years of the doum palm – native to (northern) Africa – probably indicates the intensified use and propagation by humans. The study of other archives in the northern Sahel (Mao region, East-central Chad) will provide additional data on the development of oases economies.

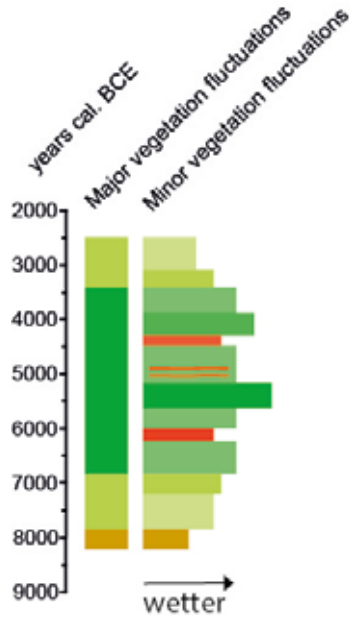




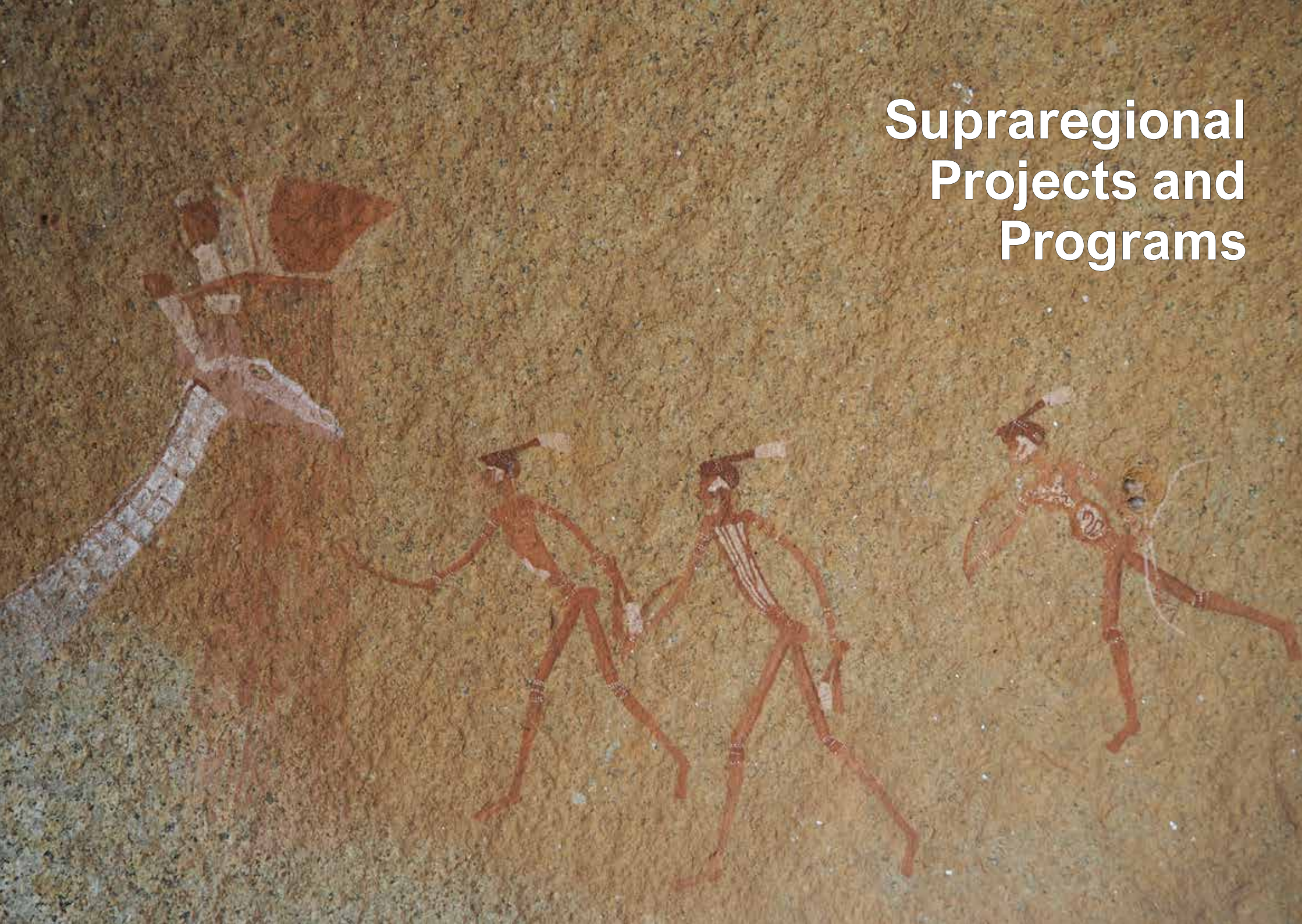


Top left: *Celtis*-type pollen (400 x magnification). Today hackberry trees are widespread in the Sudanian phytoregion and south of it. Its records with more than 10% of the pollen spectra during Middle Holocene indicate its local occurrence in the Ounianga Basin in the past - when it was wetter. ***Top right***: *Grewia*-type pollen (400 x magnification). *Grewia* still occurs in the Sahara today, but in favorable habitats such as mountains. The consistent records in the pollen diagram of Lake Yoa before and after the wettest periods indicate recurrent conditions favoring the spread of *Grewia*. ***Left***: *Hyphaene*-type pollen (400 x magnification). The doum palm is widely distributed and intensively used. The Holocene pollen records prove that this palm is native (Photos: M. Dinies)

An initial descriptive evaluation of the early and mid-Holocene pollen diagram of Lake Yoa allowed us to identify major and minor ecological shifts that indicate a highly variable environment preceding late Holocene aridification and the emergence of groundwater-fed oases and their cultivation.



Based on the variations of different pollen types, major and minor vegetation fluctuations have been established for the Early and Middle Holocene. The major vegetation changes are summarized in the graph 'major vegetation fluctuations'. The following colors represent the respective vegetation formations/ecosystems: orange – semi-desert, olive green – thorn savanna, green – savanna. The distinct vegetation fluctuations within these periods have been delineated in the graph 'minor vegetation fluctuations', as well as dry spells. The colors follow the above mentioned coding, with additionally red – dry spell (Graph: M. Dinies)



Supraregional Projects and Programs

The Archaeology and (shared) heritage of German colonialism in Africa

CORNELIA KLEINITZ / JÖRG LINSTÄDTER

Building a German settler colony: Woermann House in Swakopmund, Namibia (Photo: C. Kleinitz)

The project 'Archaeology and (shared) heritage of German colonialism: Materialities of colonization, resistance and cultural entanglement on the African continent' was developed at the Commission for Archaeology of Non-European Cultures (KAAK) of the German Archaeological Institute (DAI) in late 2020. It is dedicated to collaborative archaeological research and preservation/presentation work relating to German colonialism on the African continent, specifically in Ghana, Togo, Cameroon, Namibia, Tanzania, Rwanda and Burundi. The archaeological project supplements research in other fields and is linked to current academic and public debates in Germany, other former colonial powers and the affected African countries. Serving as an ‘umbrella’ for a range of activities, the project builds networks with and between researchers in Africa and Europe, undertakes comparative research on materialities of colonization processes in Africa and cooperates with specific archaeological and preservation/presentation projects. In the sense of a 'shared heritage', research in the framework of the project is designed to be cooperative and dialogical, providing room for multiple perspectives on the colonial past and its often controversial legacies.

German presence on the African continent dates back to the 17th century, when Brandenburg-Prussia established forts on the West African coast and became involved in the Atlantic slave trade. The formal colonization of the African continent by European powers took place in the later 19th century, after the 1884/85 Berlin conference. But the colonization process had already been ongoing for decades, with an increasing presence of German traders and missionaries in what later became Togoland (Togo and Eastern Ghana), Cameroon, German South-West Africa (Namibia) and German East Africa (Tanzania, Rwanda, Burundi). The structures of German colonial administration and infrastructure were established across the different colonies, as were the systems of exploitation, extraction, coercion and violence. These met with a variety of local conditions and responses, ranging from cooperation to various forms of resistance against German colonial rule. Material traces of German colonialism in Africa include missionary sites, buildings of the colonial administration, infrastructure and (plantation) economy, residential buildings, forced labor and concentration camps, memorials, conflict sites and landscapes as well as a variety of imported and local objects in different spatial contexts. The DAI-project focuses on individual case studies, first in Namibia and Ghana, but it also compares material manifestations of colonial rule and local agency across the various colonies.

The project initially co-organized workshops on 'The archaeology of European colonialism in Africa' together with the University of Cambridge in 2021 and 2022 in order to promote networking among researchers within and beyond the African continent. Archaeologists from Ghana, Togo, Cameroon, Namibia and Tanzania as well as from Germany and Great Britain presented and discussed their work and explored possibilities for transnational cooperation

Remembering colonial violence: Monument for the victims of the Herero and Nama genocide 1904-1908 in Windhoek, Namibia (Photo: C. Kleinitz)

Visiting the Archaeological Museum at the University of Ghana with its objects from German colonial sites during the 2022 TANA meeting (Photo: C. Kleinitz)

within Africa and with European cooperation partners. Case studies that were presented at the first workshop included research on conflict landscapes and memory processes related to the Majimaji War in Tanzania, or the transformation of local settlement patterns by the German colonial administration in Cameroon. Also discussed were the ways in which early colonial maps preserve information on the pre-colonial social/cultural landscape in Namibia that was erased after the genocide of the Herero and Nama people by the German colonial army in 1904-1908. Based on this initial meeting, various ideas were proposed for the development of common questions, methods and approaches to the study of the archaeology of colonialism in Africa. A further workshop is planned to take place as a session at the 16th Congress of the PanAfrican Archaeological Association (PAA) in Tanzania in mid-2022, where the research network on the archaeology of colonialism in Africa will be consolidated and expanded.

In early 2022, the archaeology of German colonialism provided the theme for the eighth meeting of the DAI's TransArea Network Africa (TANA) at the University of Ghana, Accra/Legon. The meeting was co-organized together with Dr. Wazi Apoh, who serves as Dean of the School of Arts and Professor at the Department of Archaeology and Heritage Studies and is a corresponding member of the DAI. Wazi Apoh has worked extensively on the archaeology and heritage of (German) colonialism in Ghana and Togo. At the TANA meeting, staff and graduate/PhD students from the Department of Archaeology and Heritage Studies gave an overview of the impressive range of research on the archaeologies of slavery and colonization that is being undertaken at the University of Ghana. Research on these topics is regularly flanked by preservation measures at these difficult heritage sites as well as by community involvement and public presentation measures, some of these supported by public funding from Germany.

During site visits to coastal slavery forts as well as to the Volta region in eastern Ghana, which was once part of the German Togoland colony, project members and the TANA group were able to gain a fundamental overview of the types and characteristics of colonial-period heritage sites, their state of preservation, their conflictive roles in the lives of local communities as sites of memory and memorialization, and their potentials as educational resources for national and international tourists as well as the local population. Discussions took place on how to develop joint projects in the fields of the archaeology of (German) colonization and the preservation/presentation of the 'shared heritage' of German colonialism in former Togoland. Our project's involvement will initially focus on raising the visibility and critical awareness of colonial heritage sites by co-developing an on-site system of signposting and information boards as well as an off-site web-resource. Further projects are envisaged to involve participation in architectural conservation (planning) at mission and colonial administration sites, their conversion into educational hubs as well as (university) collections management involving the curation and exhibition of objects from colonial contexts.

Discussing the preservation and presentation of the shared heritage of German colonialism in Ghana: The TANA group during their guided visit to the site of the Steyler mission, Kpando (Photo: C. Kleinitz)

Participants of the collaborative annual meeting of TANA and "Entangled Africa" in December 2019 at the German Archaeological Institute in Berlin (Photo: DAI)

Interactions of people in Sub-Saharan Africa throughout the last six millennia – The DFG-priority program Entangled Africa

JOHANNA SIGL / FLORIAN LUKAS / JÖRG LINSTÄDTER

From an archaeological point of view Africa is a hotspot for the study of human history. Many political, social and religious constellations and processes that we can observe today in Africa have their origin in the historical development of the last 6000 years. We owe numerous cultural inspirations and innovations to the people living here, some of which have spread throughout the world. But Africa has also been affected by climate and environmental changes for millennia. They have had an impact on the economy and on society; they led to conflicts and major migratory movements, and to a metamorphosis of nature, people and language that continues to this day.

In the study of Africa, well known geographic areas and historical periods are juxtaposed with almost unknown regions and contexts. Even until the recent past, the view at the continent's history has been directed primarily from the outside, shaped by insights and ideas from studies in Europe and the Near East. Africa is portrayed as a recipient of technological, political, and religious innovations, rather than as a source of it. Only recently this viewpoint started to change. The DFG-funded priority program "Entangled Africa" (https://www.dainst.

blog/entangled-africa/en/home/), established in 2018, is one of the first attempts at looking on Africa's cultural and environmental past from an African perspective. In this attempt "Entangled Africa" is closely connected to several other research projects of the DAI in Africa, such as the Hamadab Archaeological Project at Berlin Department, the Yeha project at Oriental Department, the Realities of Life project at Cairo Department (see U. Nowotnick / P. Wolf, I. Gerlach et al. and J. Sigl et al. in this booklet), and to the aims of the research network TANA.

The program "Entangled Africa" is coordinated through the KAAK in Bonn, and in 2022 entered its second three-year funding phase. Its interdisciplinary research projects focus on intra-African interactions in the past and processes that originated on the African continent and affected neighboring regions. Under-researched areas south of the Sahara are targeted in the scope of the projects and in the cooperation of the German and African institutions involved in the program. Indicators for interaction, such as non-local objects or raw materials and innovative technologies, mechanisms of interaction, like for example the types of migration, exchange, and trade which once took place on the African continent, and patterns of interaction, that is the role of the geographic situation of a settlement, climate and environmental changes, etc. from about 6000 to 500 BP are examined in detail. The project "FAIR.rdm" (formerly "Learning through connecting") at the University of Cologne, in close cooperation with the coordination, supports the other SPP projects in sustainably securing and publishing their data according to the most up-to-date standards.

Several working groups within the program have been established for the purpose of summarizing the common interests of the projects on a methodological level as well as in the-

Workshop of the Working Groups on natural sciences and data management for botanical research in Berlin 2019 (Photo. J. Sigl)

matic research questions. The most recently established working group derived from ideas brought forth by the Young Scientists of the program. It focuses on highlighting the role of women in historical chronologies. These working groups build the foundation for the answering of the overall questions of the program. The results of the "Entangled Africa" projects and working groups will be an integral part of the German-African traveling exhibition "Planet Africa" that will premiere in 2024 (see M. Rotgänger et al. in this booklet).

Virtual meetings became common during the pandemic, but they also allowed the Young Scientists of the "Entangled Africa" program to connect even though they were spread out through Europe and Africa (Screenshot: J. Sigl; Slide: E. Razanatsoa)

Indigenous varieties of grain produced from domesticated sorghum and pearl millet found commonly throughout sub-Saharan Africa (Photo: S. Matthews)

Connecting Foodways – Cultural entanglement and technological transmission between the Middle Nile valley and central and eastern Africa during the Early Iron Age (c. 1000 BCE to 1000 CE)

STEVEN MATTHEWS / ULRIKE NOWOTNICK

The study of domestic culinary traditions provides a new means for investigating indigenous African cultural interaction between early Iron Age complex societies across sub-Saharan Northern Africa. This is a particularly important subject, as study of these societies has often emphasized external connections with the Mediterranean, Near Eastern and Arabian worlds (through elite media, monuments, formal trade, etc.). The Connecting Foodways project therefore employs a perspective which instead focuses on the degree to which African foodways and inner-African interaction were an integral part of day to day non-elite lifeways.

In northern East Africa, these ancient sub-Saharan food traditions were characterized by cuisines centered around the production of porridges, made from processed grains and plants cooked in globular ceramic pots. This 'porridge and pot' tradition derives its properties from the unique processing characteristics that define domesticated African crops (sorghum, pearl millet, teff), and their wild progenitors. The African cuisines that resulted from these characteristics, for instance, contrast noticeably with foodways based on Near Eastern crops (emmer wheat, barley).

Researching ancient foodways: analysis of early Iron Age handmade ceramic vessels used as cooking pots in the Sudan National Museum (***left***) (Photo: S. Matthews). Flotation of soil samples to recover ancient charred seeds and food fragments from early Iron Age oven pots, with the help of cooperation partners from the National Corporation for Antiquities and Museums (NCAM) (***right***) (Photo: U. Nowotnick)

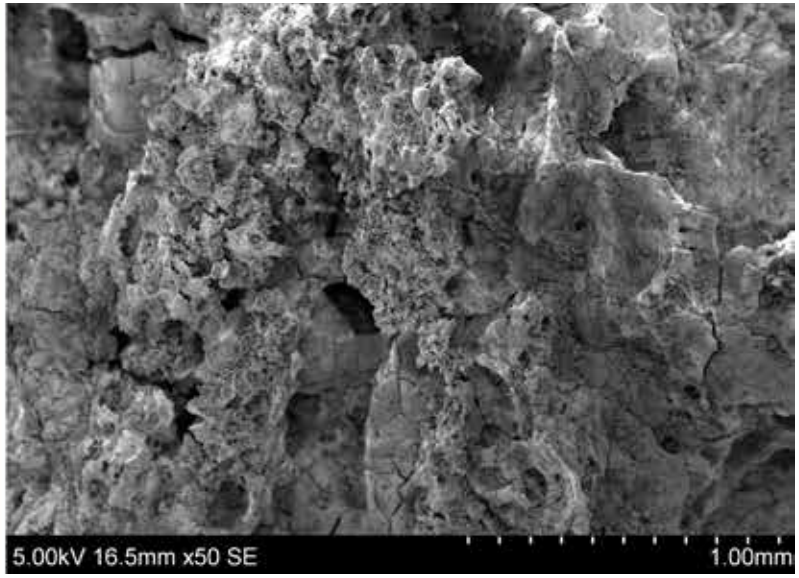
In investigating African foodways, the research of the Connecting Foodways project focuses on the analysis of these ceramic cooking vessels, being the most ubiquitous aspect of these ancient culinary traditions. Here we use core analytical techniques, including the investigation of form, fabric, manufacture, and use traces, to inform on cooking technologies. This is combined with the application of newly developed laboratory approaches, such as the analysis of lipid and starch residues, to provide evidence of ancient foodstuffs. These are

Evidence of African bread traditions recovered from houses in the Kushite settlement at Hamadab: ceramic griddle plates dating to the early to mid-first millennium CE (***left***) (Photo: S. Matthews).

complemented by botanical and faunal remains. This analysis of form and function in handmade cooking vessels provides a unique and innovative approach to the study of regional interaction and cultural transmission, which has typically focused on the style and decoration of fine ware ceramics, raw materials, or prestige goods.

As northern East Africa was an important zone of entanglement between African and Near Eastern food traditions, we have drawn on detailed evidence for the culinary traditions of this region from a number of sites excavated by the DAI in Sudan and Ethiopia, such as Hamadab, Meroe, and Ziban Adi. This includes data from kitchens and cooking areas from settlements along the Middle Nile valley, within the Sudanese kingdom of Kush, and from across the highlands of northern Ethiopia and Eritrea, as part of the pre-Aksumite complex and Aksumite kingdom.

These differences between Near Eastern and African foodways are particularly evident through comparison of their respective bread traditions. As wheat contains gluten, Near Eastern bread traditions were based around bread baked in ceramic cones or trays in ovens, whereas indigenous African breads, because of the gluten-free nature of local crops, take a number of alternative forms, including pancakes and flat breads cooked over or directly in the fire. As a consequence, Near Eastern bread technologies were locally adapted in sub-Saharan Africa to suit the performance characteristics of local cereals, resulting in the widespread adoption of ceramic griddle plates for making bread in domestic contexts. These



Scanning electron microscope image of sorghum-based flatbread remains (***right***) (Photo: G. Carretero)

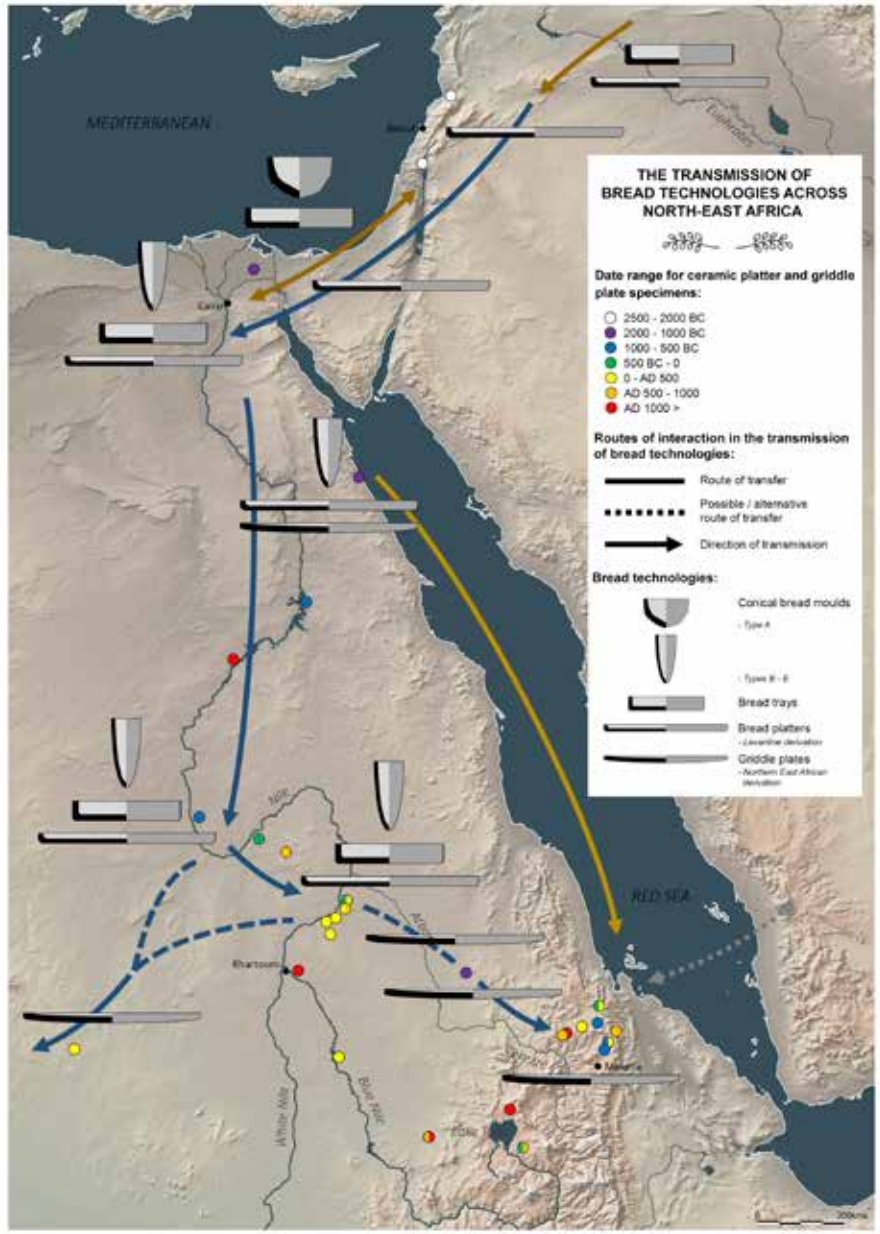
griddle plates become extremely common throughout northern East Africa during the early Iron Age, and have great potential for studying household transmission in food technologies.

Moving away from these important northern East African contact zones, we further investigate to what degree this 'porridge and pot' tradition is also representative of wider sub-Saharan foodways across north Central and West Africa, where sorghum-based foods give way to cuisines utilizing other indigenous crops, including pearl millet and other regional plant preferences (yams, etc.).

Here our research is centered on specific culinary markers, based around certain technological characteristics, such as globular pots, mat-impressed surfaces, and finger-tip impressed bases. Combined with the analysis of botanical and faunal remains, these serve as a basis for investigating regional interaction in cooking practices. Here our research has focused on the evidence of cooking practices from the early Iron Age facies of a number of north Central and West African archaeological cultures, including Nok (Nigeria) and Tichitt (Mauritania), and important routes of interaction between East and West Africa (Darfur and Kordofan, the Lake Chad basin, and the Middle Niger), as a basis for the study of long-term cultural transmission.

The Connecting Foodways project was devised and coordinated by Ulrike Nowotnick and Steven Matthews, and is funded by the DFG since 2019 as part of the SPP Entangled Africa project (DFG project number 404218798). The project is based at the DAI Central department (Berlin), with administrative direction provided by Simone Wolf and Pawel Wolf.

Vessels from the Kushite settlement at Hamadab, Sudan: Early Iron Age handmade globular cooking pots, here with fingertip impressed bases which helped thermal conductivity when placed over the fire (Photo: S. Matthews)



Likely routes of transmission involved in the diffusion of Near Eastern and African bread baking technologies across north-east Africa (Image: S. Matthews)

Cultivated Landscapes – Land-use and cultural landscape development in north-hemispheric African savannas

ALEXA HÖHN

West African landscapes are cultivated landscapes, even though it may seem otherwise to European observers at first glance: Trees are present in the middle of fields and stumps of cleared trees are not removed from the fields and may sprout again. In the savannas, but also as far south as the rainforest, trees are thus an integral part of the cultivated landscapes. This is because, in the traditional form of tillage with a hoe, it is not necessary to remove all the woody plants from a field. In extensively used fields, lying fallow for some years for recovery, shrub thickets grow and tree stumps develop back into small trees. Even seemingly unused forest islands in the savannas show traces of earlier use—their groves have a high proportion of secondary trees, which become established after many decades of the former fields lying fallow. The trees are not only retained because it is labor-intensive to cut and remove them, but also because they contribute to the livelihood of rural populations, providing fruit for nutrition, timber, fuelwood, and medicinal products. In the context of sustainable agriculture in West Africa, the protection and promotion of such agroforestry systems, where fields and

Cultivated landscape with fields and fallows in Central Nigeria (Photo: A. Höhn)

Millets and legumes intercropped in a field dotted with trees and tree stumps in Central Nigeria (Photo: A. Höhn)

A herd of cattle and sheep near Janajala in Central Nigeria grazing on a young fallow (Photo: A. Höhn)

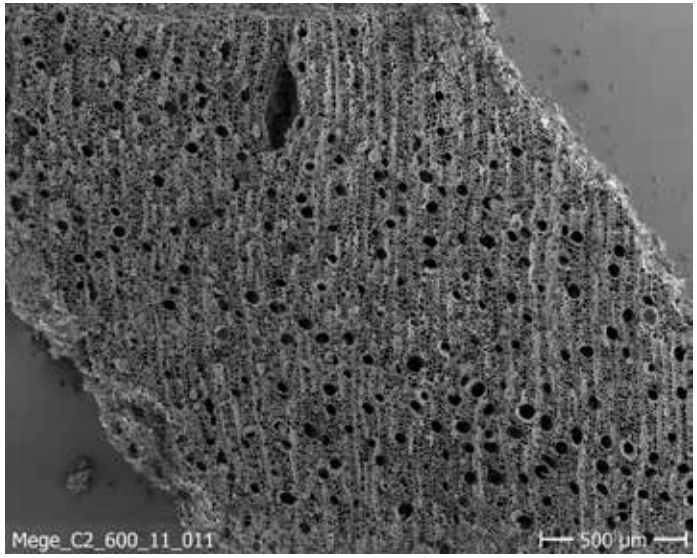
woody plants are managed on the same area, is also on the agenda of initiatives such as "Re-greening Africa" supported by, among others, GIZ and the World Agroforestry center.

In West Africa today, such cultivated tree parks exist in different varieties. Depending on the type of land-use, people prefer different useful species, but cultural preferences and local environmental conditions also play a role in the composition of the tree layer. Nomadic pastoralists prefer different trees than groups with only a few small animals; intensive management with short fallow periods encourages different secondary growth than extensive management with decades-long fallow periods. The existence of various cultivated tree parks in different regions of West Africa today is but the end result of a process that has been ongoing for centuries—even millennia—and whose dynamics are largely unknown.

The project "Cultivated Landscapes" precisely aims to understand more about the history, dynamics and sustainability of these systems in the past. To this end, we are examining wood charcoals from sites in key regions of archaeological research throughout West Africa dating to the last 3000 years. Archaeological charcoal is a well-suited archive of the vegetation surrounding past settlements. As a remnant of firewood collected on a daily basis, it represents a sample of the vegetation located close to the settlement, such as the cultivated tree parks. The charcoal spectra, generated by assigning the charcoal fragments to different woody species or groups of species, allow concluding to the local vegetation and its changes over time. This project also compares these local spectra across various regions to determine when and where different types of cultural landscapes were present, and what role land use, environmental factors, and climate played in their formation and change.

Combining the results of charcoal analysis with investigations of charred fruits and seeds, it has become apparent that cultivated tree parks with shea trees were established in central regions of West Africa as early as 1500 years ago. The seeds of the shea tree, often incorrectly referred to as 'nuts', contain a large amount of fat that can replace animal fats in the diet. Today, shea butter is important for both cosmetics and confectionery as a substitute for cocoa

Tree stump resprouting in a young fallow, Central Nigeria (Photo: A. Höhn)



Top: Charcoal fragment prepared for analysis with the incident light microscope, to the left a sample of wood charcoal from an excavation in the Chad Basin, Nigeria (Photo: A. Höhn). ***Left***: Transverse section of a charcoal fragment identified as belonging to the Rubiaceae family. Part of a sample from the Chad Basin, Nigeria (Photo: N. Döring + A. Höhn)

butter and generates income for rural women in shea park regions. Concerning the history of today's shea parks, more research is required to show whether these identified early shea

tree parks formed a core area from which this agroforestry system slowly spread into other regions of West Africa. Little is known about either timing or distribution of shea parks in the past. What is clear, however, is that these parks spread along the Gambia to the west coast of Africa only as recently as the 19th century.

Cultivated tree parks with *Faidherbia albida*, the apple-ring tree, seem to have emerged later than shea parks and are especially prized by pastoralists. They first appear in the Sahel about 1000 years ago, but only develop in more southerly regions several centuries later, possibly coupled to the southward advance of nomadic pastoralists.

The southwestern Chad Basin however, shows that the situation can also be quite different. In this landscape, where clay plains have been shaped by annual flooding for over 3000 years, cultivated tree parks are not visible in the charcoal archives. While they may have existed on the smaller and larger sand islands of the region, the charcoal archives instead reflect the use of the natural tree cover of the clay plains. Visible changes in the charcoal spectra rather relate to the long-term drier conditions. Human influence, as visible today both in the treeless plains and in the heavily overused cultivated tree parks on the sand islands, appears to have only heavily impacted the region within the last 500 years.

In cooperation with archaeologists of the DAI and beyond, this project explores further sites and regions of north hemispheric Africa aiming at eventually gaining a more detailed picture of the development of the cultivated landscapes—from Senegal to the Nile and from the Sahel to the northern Guinea zone, the edge of the (today unfortunately often only former) rainforest area.

Apple-ring tree (*Faidherbia albida*) within a millet field in Northern Burkina Faso (Photo: A. Höhn)

Planet Africa – Archaeological time travel – Pilot project of a traveling exhibition

MIRIAM ROTGÄNGER / JÖRG LINSTÄDTER / GERD-CHRISTIAN WENIGER / JOHANNA SIGL / WAZI APOH / EWA DUTKIEWICZ

Africa is a continent of diversity. With more than two million years, it is the longest witness of human evolution and therefore has long been a continent of inspiration far beyond its natural boundaries. Since the 19th century, Africa has been the core of countless archaeological research projects. We are planning a new kind of exhibition concept, which deals with the fascinating archaeology of Africa with a perspective up to the present day.

"Planet Africa" is being developed under the direction of Jörg Linstädter (KAAK) and Gerd-Christian Weniger (University of Cologne) and in cooperation with Wazi Apoh (University of Accra). With funding from the Federal Foreign Office of the Federal Republic of Germany and the German Research Foundation (DFG), the pilot project serves as a "proof of concept" for the traveling exhibition scheduled to start in 2024, which will be enriched by, among other things, the research results of the DFG priority program "Entangled Africa" The opening of the exhibition will take place in the "Museum für Vor- und Frühgeschichte – Staatliche Museen zu Berlin" and will tour through Germany from there. Parallel to this, five African museums will show the exhibition. They will receive a construction manual for the exhibition in advance and will be supported financially as well as conceptually.

The "Planet Africa" pilot started in 2021 and was finalized in April 2022. As part of the pilot, we produced a pilot film about the exhibition and three slideshows and a cinematic for Module 3. In addition, the wall design for three presentation boxes were conceptualized for this module and two of them were built within the pilot phase. The

Meeting at the media agency *Notwendiges Übel* in Düsseldorf to discuss the font size of the texts (Photo: G.-C. Weniger)

Final key Illustration for Module 3 (Picture/Design: 249 Writers).

scientific conception of the content was done in close cooperation with researchers from the DFG priority program "Entangled Africa" and their African partners. Produced by African artists, each module receives its very own visual signature through an illustration. These are commissioned works with predefined contents, which are created in the style of the respective artists. For module 3, the artist collective "249 Writers" from Sudan created the illustration. With the help of the African artists, we hope to create a stage for selected key topics of the exhibition, building bridges between archaeological roots and the African presence. The digital

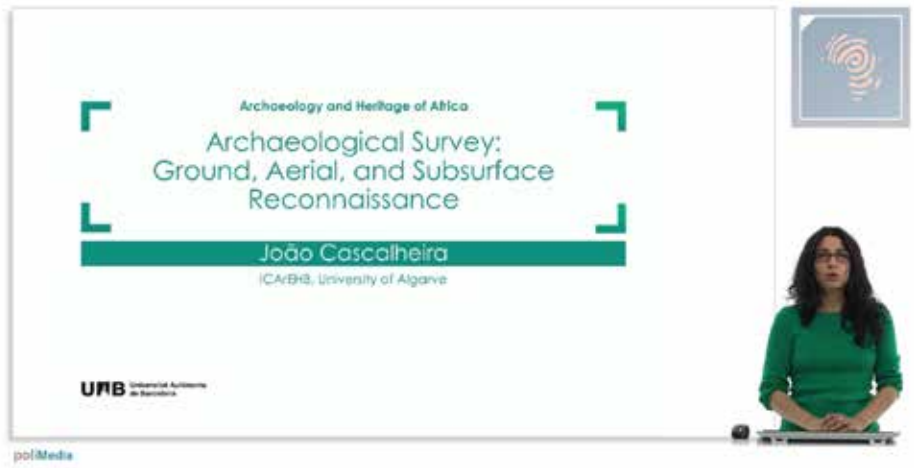
Module 3: Theme Box 1 Module 3: Introduction box Module 3: Theme Box 2

Wall design of the introduction and two theme boxes of Module 3 (Concept/Design: Notwendiges Übel)

processing of the modules allows the exhibition to be flexibly adapted to the location, focus of interest and local archaeological artifacts. Thus, the exhibition is at each location unique and it is therefore worthwhile for visitors, for example in Germany, to visit it several times.

The modules deal with Africa's important role in human history from the first representatives of the genus Homo to more recent technological and nutritional impulses that spread from Africa to the whole world. They present a continent that fascinates through its natural diversity and which, with continuous (environmental) changes, triggered adaptation processes, migratory movements and repeatedly produced new survival strategies. Alongside archaeological finds, images and written signs provide comprehensive testimony to the art, craft, technology and environment of times long past- and to the connections between people across vast distances. The remains of settlements and urban centers reveal social and political structures, adaptation to a life of close coexistence, while at the same time nomadic ways of life remained essential for survival. Additionally, African researchers and artists involved in the research projects and in the exhibition will demonstrate the modern use of old knowledge, the work and interpretation of their own past.

The 6 thematic modules of the Planet Africa exhibition (Graphic: Notwendiges Übel)



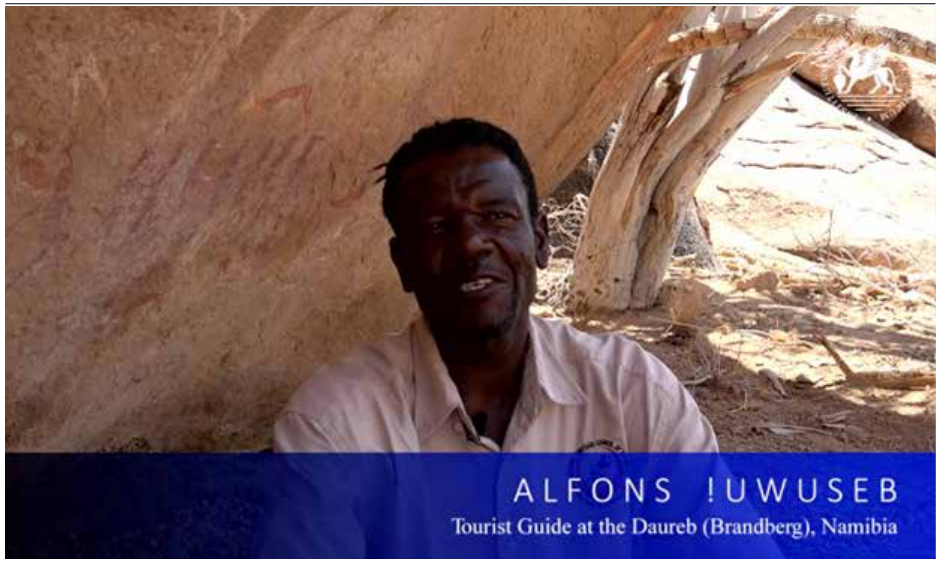
Example of a class recorded at the UAB Faculty of Medicine Resource Center (CRD) studio, using the Polimedia system (Slide: ONLAAH)

The ONLAAH project and online Course on Archaeology and Heritage of Africa

SOFIA FONSECA

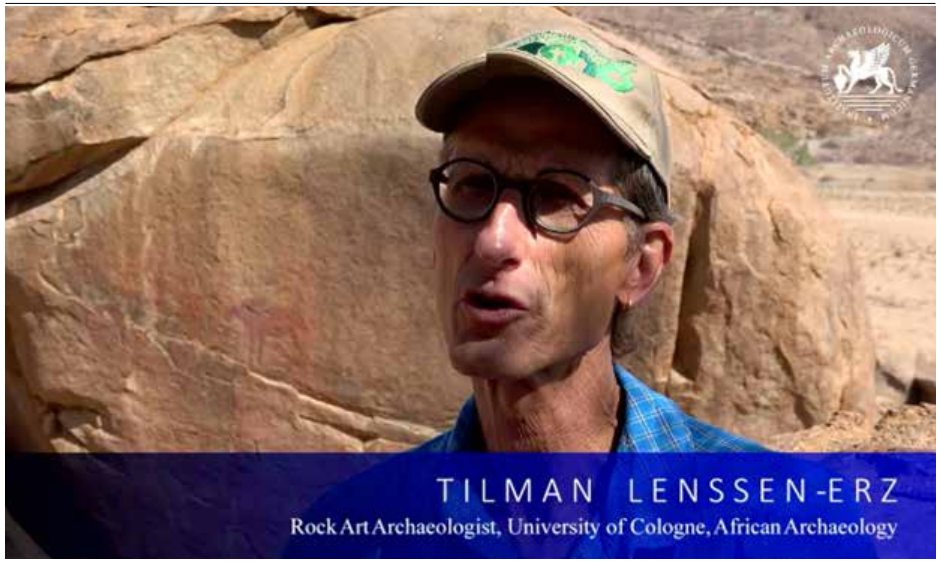
The creation of an online course on Archaeology and Heritage of Africa is part of the DAI capacity building approach in its collaboration and cooperation projects worldwide. The course is part of the ONLAAH project- Online course on African Archaeology and Heritage, a hub of resources dedicated to introducing and preparing students about the Archaeology and the Heritage of Africa in an accessible way. The format for the course will be of a MOOC, a Massive Open Online Course, that will be held on the UAB-Coursera platform and will be free and accessible to anyone in the world. The course is coordinated by the German Archaeological Institute (DAI) in a consortium with the ICArEHB, the department of archaeology from the Algarve University, Portugal, the University of Neuchâtel, Switzerland, and the University of Louisville, United States of America. Our partners include the Eduardo Mondlane University, Angola, the University of Namibia, the University Autonomous of Barcelona (UAB), the University of Cologne, and the Heinrich Barth Institute, in Cologne.

The course on Archaeology and Heritage of Africa is a collaborative work with 30 teachers from around the world contributing their research, knowledge, and time to create the 34 classes we are offering. The course is divided in 4 modules:



Examples of two classes recording with MomentmalTV: Community Heritage Management in Namibia: The Daureb

1. Introduction, including introduction to archaeology and African archaeology, and geographical settings.
2. Methods, including introduction to chronology and methods; fieldwork (archaeological survey: ground, aerial, subsurface reconnaissance, and using mobile applications); Lab work (archeobotanical: the study of charcoal and the study of pollen; animal bones: Technology and function; Lithic technology and micromorphology; Introduction to the study of pottery and archeometry; zooarchaeology); human remains (biological anthropology and archaeogenetic); and Rock art.
3. Heritage management, including introduction to heritage management, conservation and presentation, local development, and community-based management.
4. Case studies, putting together the knowledge acquire in the previous modules the case studies bring to live in a practical way, what the students have been learning. The case studies are presented by researchers working in different regions in Africa:
    - Contacts of hunter-gatherers and early farming communities in today's Southern Mozambique, Changalane, Mozambique, by Jörg Linstädter, German Archaeological Institute, and Décio Muianga, Eduardo Mondlane University.
    - Cultivated Landscapes – Archeobotanical research in the West African Savanna, by Alexa Höhn, Goethe University in Frankfurt, Germany.
    - De-greening of the Sahara – Archeobotanical research in Northern Chad, Michèlle Dinies, German Archaeological Institute, in Berlin, Germany.



Mountain Guides (***left***), and the introduction to African Rock Art (***right***) (Images: ONLAAH)

- The Stone Age of Mozambique: Niassa & Massingir, Nuno Bicho, ICArEhB, Algarve University, Portugal.
- The rock paintings of the Upper Brandberg, Tilman Lenssen-Erz, Research Center Africa, University of Cologne.

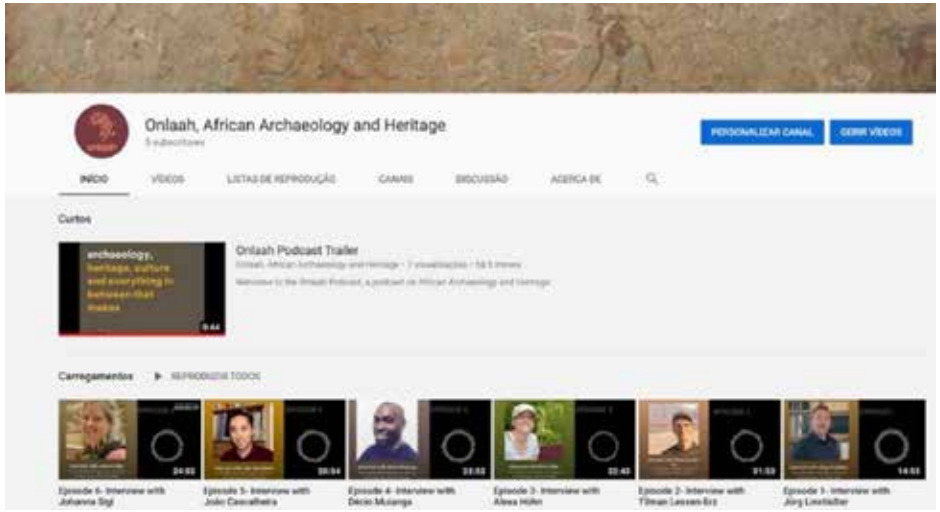
Inside the modules, the classes were divided in two main typologies: 18 videos recorded by the filmmaker team MomentmalTV, including the case studies and the lab work videos; and a second typology of videos recorded at UAB Faculty of Medicine Resource Center (CRD) studio, using the Polimedia system. This system created by the Polytechnic University of Valencia, permits creating high resolution, multimedia, and educational content, in a very accessible way. The classes are supplemented with complementary materials and readings. By the end of each module the students have a discussion theme and a mandatory questionnaire they must correctly solve to be able to move forward to the next module.

The MOOC is now complete and under technical revision by the UAB-Coursera team and will be available to the public in May 2022.

Another important part of the project is communication and dissemination. Therefore, we have created a package of tools to communicate with our public that include:

- Podcast.
- YouTube channel.
- Blog.

The ONLAAH podcast on African Archaeology and Heritage. In our first season we invited teachers from our course to present their work and future projects. A second seasson will be released during 2022 (Webpage: ONLAAH)



The ONLAAH African Archaeology and Heritage YouTube channel, with the podcast episodes. In this format our listeners can listen and read the subtitles of the different episodes, making them more accessible to everyone (Webpage: ONLAAH)

- Newsletter.
- Social Media (Facebook and Instagram).
- Seminars and conferences presenting the course.

Regarding the podcast, our mission is to bring archaeology to the public in an easy way, introducing the course teachers, their journey into archaeology, and their past and future projects. We have recorded the first season of the podcast which includes 6 episodes available at podcast platforms such as Anchor, Spotify, Apple Podcasts, and Google Podcast.

The YouTube channel was created to access younger public and to permit the listeners to have subtitles to the interviews, making them more accessible.

The Blog and newsletter are also ways to communicate and keep in touch with our public and anyone interested in the subject. We release both the blog and newsletter when we have news or content that may be of interest regarding our course evolution.

On social media we choose to have a Facebook and Instagram accounts to narrow but we are considering starting a twitter account due to the strong presence of archaeology content in this media.

Finally, we present the ONLAAH project and the online course in seminars and conferences to bring awareness to the project and looking to engage students to our upcoming course.

To keep update with the development of the project we invite you to visit our web page www.onlaah.com and subscribe to our newsletter.

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