ARCHAEOLOGY WORLDWIDE

EGYPT – PRESENT CHALLENGES
Archaeology in times of upheaval

GATEWAY TO OTHER WORLDS
German and Chinese archaeologists investigate unknown societies on the Silk Road

SHERDS BRING LUCK
In Pietrele, an ancient society is being brought back to life, layer by layer
Dear readers,

What is archaeology? A strange question, you might think. Doesn’t everyone know that? Yes and no. Of course archaeology still is a science that deals with the remains of ancient cultures. But it does so, today, in a different way and with more broadly conceived goals than the public appears to appreciate. Toiling with spade and brush at remote locations in search of old stones and sherds naturally continues to be part of our science – but the questions and the methods of its practitioners have become more and more complex over time. Modern antiquity studies use the methodologies of the natural sciences, the social sciences and cultural studies to try and reconstruct the landscapes and environments inhabited by ancient societies. Another consideration is that the work of the German Archaeological Institute is always directly affected by the social and political realities of its host countries.

What is the German Archaeological Institute? The DAI is one of the biggest archaeological research institutes in the world. With branch offices at 20 locations, it is engaged in nearly 200 projects (with cooperation partners) and is active all over the world: in the Mediterranean region, in the countries of Eurasia, in Asia, Africa and South America. Its primary purpose is to conduct scientific research. But an important part of the DAI’s work also centres on the preservation and management of the cultural heritage in the host countries. As a research body operating within the area of responsibility of the Foreign Office it plays a significant part in the foreign cultural and educational policy of the Federal Republic of Germany.

Why a new archaeological magazine? We have lots to say. And public interest in archaeology remains high and perhaps has even grown. Reason enough for us to issue a new magazine: one that explores the scientific aspects of the DAI’s work as much as its political implications, its ability to solve ancient puzzles and to render ancient knowledge useful to our own time.

Happy reading!

Prof. Dr. Friederike Fless
President of the German Archaeological Institute

ARCHAEOLOGY WORLDWIDE

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COVER PHOTO
The great dam of the oasis of Marib (Yemen) is an example of sophisticated water management in extremely arid regions. “Bau A” is a hydraulic structure from the 1st millennium BC. It possesses three pillars with a rounded upstream face and between them a solid stone wall which served as a spillway in the event of flooding. Aerial photo: DAI/Deutsches Bergbau-Museum, Bochum

Archaeology Worldwide will be published three times a year. Special features will report on ongoing projects in our host countries – we begin with Egypt. General questions that are common to a number of projects will be explored in a cover topic – and it is only logical, in the UN Year of Water Cooperation, to choose water as the topic for the first issue. Heritage preservation will have a section of its own, though reports may also appear elsewhere. All this and more awaits you in an entire cosmos of archaeological subjects – you only need to turn the page!
Hinkel Archive as basis of cooperation between DAI and QSAP

Few people knew Sudan as well as Friedrich W. Hinkel did. The construction history scholar and architect was a tireless collector of material about the archaeological sites and architectural monuments of the African country with its extremely rich cultural history.

When Friedrich Hinkel died in 2007 he bequeathed the archive to the German Archaeological Institute with the request that it should be digitized and made accessible for research purposes.

The archive was the occasion for a visit by a delegation from the Qatar-Sudan Archaeological Project (QSAP) to the Berlin head office of the German Archaeological Institute. The project, which is financed by the Qatar Museums Authority, has as its aim of promoting publication activity, archaeological fieldwork and research in North Sudan. Importance is also attached to questions of cultural heritage management, to conserving archaeological sites and presenting them to tourists. Digitizing the Hinkel archive is an important part of the work, particularly concerning the preservation of the famous Pyramids of Meroë. Cooperation has also been agreed with other DAI projects in Sudan, at Hamadab and the Royal Baths of Meroë. As a result of being included in the project it will be possible for research plans and conservation measures there to be further developed in future.

The Royal Baths of Meroë are an outstanding example of the cultural transfer between the Kingdom of Kush (controlling the middle section of the Nile valley), Egypt and the Mediterranean. The Royal Baths, centring on a large water basin, were built directly beside two palaces. An elaborate decorative programme reveals the influence of Mediterranean cultures, as in the depiction of a musician with pan pipes. The DAI project is being carried out in cooperation with the National Corporation for Antiquities and Museums in Khartoum.

IZMIR

Plans for a German-Turkish archaeological centre

The building of the former German Consulate General in Izmir was used for over 80 years as a career consular post and is thus an important monument in the Turkish city’s history. Now an appropriate new use is being sought for the prestigious building. The Turkish minister of culture proposed in 2011 that the premises could be used as a German-Turkish archaeological centre. The German Foreign Office consequently commissioned the Istanbul Department of the German Archaeological Institute to examine the building’s history and its state of repair. “These activities are the groundwork for planning the conversion of the building, which could also include a German-Turkish archaeological centre,” explains Martin Bachmann, deputy director of the Istanbul Department of the DAI.

The building of the former German Consulate General stands at a very prominent location on the traditionally popular promenade known as the Kordon, the best address in Izmir. It was built in around 1900 as a mansion for the wealthy Levantine businessman Elzéar Guffray. Designed in opulent eastern Mediterranean Histosinan style, the mansion took its place in a row of high-prestige properties that once lined the waterfront as a showcase of the city.

Izmir has experienced radical changes to its urban fabric and the process is still continuing, with the result that the building of the former Consulate General together with the Greek Consulate represent the last surviving ensemble of adjacent historic buildings on the Kordon, which invests the building with significance in cultural history terms – over and above its own architectural significance.

A German-Turkish archaeological centre would be an excellent platform for cultural and scientific cooperation between the two countries. “Beyond that it would be an ideal showcase for the many important excavations in the Izmir metropolitan area such as those at Pergamon and Miletus,” says Felix Pirson, director of the Istanbul Department of the DAI. “In addition to exhibition areas there would be space for lecture rooms and a small specialist library.”

The documentation and conversion project was directed by Martin Bachmann. A precise structural record was produced by students of the Karlsruhe Institute of Technology (KIT). Steffen Dengler, Ulrich Graf and Bertram Künste led by Dozotha Roos. Ulrich Graf produced the plans, while Steffen Dengler was responsible for the 3D models and the conversion proposal.
At first sight the Porta Nigra in Trier does not look like something that could crumble. It does appear a little unfinished, to be sure, probably because it was never completed in antiquity, yet the massive stone blocks, some of which weigh six tonnes, lend the monument an air of indestructibility. And indeed the 1,800 year old building is regarded as the best preserved Roman city gate north of the Alps. Now, though, the gate is “crumbling”, as local media reported in autumn last year. Something had to be done. First of all the gate was resurveyed.

The basis for all further action is construction research, for which the Architecture Section of the German Archaeological Institute is responsible. “By the end of 2014 every stone of the Porta will have been documented,” says section head Ulrike Wulf-Rheidt. “In fact, not all that much is known about this famous building,” she adds. Consequently, the documentation work being done on the Porta Nigra – in cooperation with the RheinMain University of Applied Sciences (Prof. Dr.-Ing. Corinna Rohn) – will analyse and describe all the construction phases from antiquity to modern times. This includes its use as a church for 750 years, a fact which many do not know. The detailed structural record will provide the first ever reliable basis for a thoroughgoing examination of the monument that combines archaeology, construction research and art history. Researchers will look into the question of whether the Porta Nigra really did remain unfinished in antiquity and if so, what it should have looked like.

Porta Nigra – “Black Gate” – is an apt name. The colour comes from the weathering of the Kordel sandstone from which it is built. In the course of time, environmental influences have left more than colour traces on what is in fact a very durable stone. The ashlar masonry has suffered damage from flaking, black encrustations, fissures and gap formation.

Once the initial documentation work is completed, a restoration plan will be drawn up in 2014 and restoration work will be able to commence in 2015. Then, section by section, the city’s landmark will disappear behind scaffolding for probably 10 to 15 years.
... like this animal relief at a 12,000 year old sanctuary in Turkey

Here, carvings of cranes and other animals found by archaeologists still pose many riddles. At Gobekli Tepe, a high hill in a flat landscape, people who were hunters and gatherers created a sanctuary consisting of 20 stone circles. The pillars were up to 5.5 meters high and weighed up to 10 tonnes. They had been cut from monumental quarried stone blocks with extraordinary precision without the use of metal tools. So this unique testimony of human cultural development can be properly documented, studied and protected, the Orient Department of the DAI is drawing up a systematic site management plan with its Turkish partners and specialists from Cottbus University and from the Global Heritage Fund. (See the article "The stone masons of Gobekli Tepe" on page 18.)  Photo: DAI/Orient Dept., Schmitz

FLORIAN KLIMSCHA, RICARDO EICHMANN, CHRISTOF SCHULER UND HENNING FAHLBUSCH (EDS.)

This volume presents initial results of the DAI research cluster "Innovations: technological, social" which since 2006 has been devoted to water management and metropolis. The vital resource water represents an important factor in all phases of human history; its technical exploitation begins with the earliest stages of the emergence of complex forms of settlement and community. The use of groundwater via wells is a constant feature and a success story. The first contributions present simpler forms of water management which precede the construction of wells. (see title story, p. 36)

NINA SCHÜCKER (ED.)
Integrating Archaeology
The conference "Integrating Archaeology. Wissenschaft – Wunsch – Wirklichkeit" organized by the Roman-Germanic Commission (RGK) as part of the project "Archaeology in Contemporary Europe" dealt with the social role, the capabilities and opportunities of classical studies. The current volume contains contributions on archaeology’s role in society and the public arena, occupational and economic aspects, possibilities of identification, as well as a chapter on archaeology and new media. Copies can be ordered from: nina.schuecker@dainst.de

The series "Menschen – Kulturen – Traditionen. Studien aus dem Forschungscluster des Deutschen Archäologischen Instituts" contains contributions on questions currently being explored as part of the DAI research clusters.

ALBERT DISTELRATH
Siedeln und Wohnen in einer Ruinenstätte. Ein denkmalspflegerisches Konzept für Herakleia am Latmos / Yerleşim ve Yaşam Alanı olarak Ören, Yeşilherakleia (Latmos) için bir Koruma Konsepti MIRAS, vol. 1

The investigation and protection of archaeological sites are inextricably linked. Often, however, archaeological research institutions are confronted with challenges regarding the preservation and safeguarding of ancient monuments that exceed their capacities and competences. Experience gained at different sites and a broad knowledge of case studies can be hugely helpful in the search for a management plan that is well suited to the particularities of a given archaeological site. For this reason, the Istanbul Department of the German Archaeological Institute has decided to launch a new publication series entitled MIRAS – “management, maintenance, and restoration at archaeological sites” – in which case studies from Turkey are discussed.

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ULRIKE EHMG – RUDOLF HAENSCH
Die Lateinischen Inschriften aus Albanien (DIA)

Present-day Albania was, in antiquity, a contact zone between cultures. In the Hellenic era, Greek city states, Hellenistic kingdoms and indigenous tribal societies existed there. During the Roman Imperial period the region became an even more pronounced zone of transition; it belonged to three Roman provinces: Dalmatia, Macedonia and Epirus. The 302 Latin inscriptions that are known from Albania are presented in this volume in new readings with commentaries on aspects of cultural history and extensive indices.

Publisher: Verlag Dr. Rudolf Habelt GmbH

GUNNAR BRANDS, MARTIN MAISCHBERGER (EDS.)
Forschungscluster 5, vol. 2: Lebensbilder, Klassische Archäologen und der Nationalsozialismus

The articles explore the lives of known German and Italian classical archaeologists of the 20th century. The biographies are not limited to the 12 years of Nazi dictatorship or the 21 years of Italian Fascism respectively, but present the entire span of the subjects’ lives, making it possible to appreciate continuities, ruptures and developments in the course of long careers. Publisher: VML Verlag Marie Leidorf GmbH, Rahden/Westfalen


Publication of colloquia on special aspects of the archaeology of Eurasia. Publisher: Verlag Dr. Rudolf Habelt GmbH

... like this animal relief at a 12,000 year old sanctuary in Turkey

Here, carvings of cranes and other animals found by archaeologists still pose many riddles. At Gobekli Tepe, a high hill in a flat landscape, people who were hunters and gatherers created a sanctuary consisting of 20 stone circles. The pillars were up to 5.5 meters high and weighed up to 10 tonnes. They had been cut from monumental quarried stone blocks with extraordinary precision without the use of metal tools. So this unique testimony of human cultural development can be properly documented, studied and protected, the Orient Department of the DAI is drawing up a systematic site management plan with its Turkish partners and specialists from Cottbus University and from the Global Heritage Fund. (See the article “The stone masons of Gobekli Tepe” on page 18.)  Photo: DAI/Orient Dept., Schmitz
EGYPT – PRESENT CHALLENGES

Archaeology in times of upheaval

At a time when a country like Egypt is facing a whole host of challenges, archaeology is not top of the agenda. “There’s no alternative to striving to maintain normality as far as possible,” says Stephan Seidlmayer, director of the Cairo Department of the DAI. And that’s what the Egyptian antiquities agency is doing too, as well as it can. It sends out inspectors, grants concessions, as agencies do everywhere. “Normality” here doesn’t mean the opposite of a state of virtual civil war, which is what the German media constantly suggests in reports that studiously ignore everyday realities in Cairo – which nevertheless, it has to be said, are certainly difficult at the present time. “When there’s conflict in the city centre, we see it on television too, just like you,” says Seidlmayer. Not only researchers and diplomats in Cairo see the one-sided reporting of the German media as tantamount to kicking someone when he’s down.

POPULAR CONSENSUS

Illicit excavation is a pressing problem at most of the archaeological sites in Egypt – a problem that, if anything, is on the increase. There is an international market for stolen artefacts – the older they are, the more they fetch. The authorities are not always as vigilant as it would be helpful to be, and the archaeologist fears that the lack of concern for cultural heritage is becoming habitual.
"For archaeological work there needs to be popular consensus," Seidl-mayer says. That means the local population must be involved in order to protect something Egypt can't do without: its 5,000 year history. And not only for the benefit of tourists in search of an educational experience or romantic enchantment, but above all for its own sake. "If the country isn't anchored in its history, it won't be able to find its bearings in the present," says Seidl-mayer, who has worked in Egypt for more than 40 years.

Establishing this much-needed consensus has been successful in Aswan, a good 900 kilometres south of Cairo. The city is growing rapidly, requiring new residential areas and infrastructure – also at the cost of archaeological excavations and find-sites. The first settlement traces go back 5,500 years; located at the border with Nubia it is an important place to gain an understanding of the early trade relations between the Mediterranean and Africa – gold, ivory, exotic woods and ostrich feathers were the commodities that were traded.

A flyer in Arabic informs the inhabitants of Aswan about the work that is being carried out. "We also translate important inscriptions into Arabic and explain spectacular ruins – also, of course, of course, with the aim of combining it all in the tourism value chain," Seidlmayer explains. Has it worked? "The flyers were snatched out of our hands," while Aswan, too, is affected by illicit excavations and plundering, an awareness has developed among the resident population about why they need to protect their antiquities – an awareness that has still to be created, in many cases, among Egypt's foreign-oriented elites.

**HISTORY LESSON IN DAHSHUR**

The archaeologist Nicole Alexanian, director of excavations at Dahshur, leads a class of schoolchildren to the pyramids. On the programme are the Bent Pyramid and the Red Pyramid, their temples and the landscape surrounding them. The 12 to 13 year old girls attend a German school, the Deutsche Schule der Byzantinerinnen (DSB), in Cairo. They are largely from the Egyptian upper-middle and upper class and are fulfilling their families' ambition to preserve their prosperity by means of the best education and training. In fluent German they answer the archaeologist's questions about the reasons for the bend and the cracks in the pyramid: "The underground was unstable," they answer correctly, and they deduce from just a few hints that the stones for the core of the gigantic edifice must have come from nearby. "We know that the material encasing the pyramid can't have come from here," says Nicole Alexanian. "So how did it get here?" – "By water?" – "Yes, by water!"

It's pretty quiet at the archaeological site of Dahshur, where the institute is conducting three excavations. Visitors are so rare that the tourist-camel drivers throw themselves on every person who comes along, touting in three languages at once. They do nowhere near as much business here as their colleagues at Giza – with the pyramids of Cheops, Chephren and Menkaure – do in normal times. The loneliness at Dahshur has an additional explanation. Until 1997 Dahshur was a prohibited military zone, and the dramatically charged atmosphere palpable when one pyramid towers before you and the next shimmers in the middle distance is overlaid by the long perimeter fencing and patrolling soldiers belonging to the military base that is still located there.

Currently the archaeologists of the DAI are battling with a very civil problem. On the site of the 4,600 year old necropolis a modern cemetery has arisen virtually over night, serving the inhabitants of the village of Dahshur. "People do know that it's an archaeological site," says Stephan Seidlmayer. "But on the surface you don't necessarily see what's lying underground." It can hardly be reversed now, but further expansion can possibly be prevented – by employing the Aswan method: "We have already begun talking with the people in the village and with the mayor, in order to impart to the residents a sense of the link between the present and the past, which might persuade them to change," says Nicole Alexanian. If it were good for business at least, if it brought in more tourists, then it would be easier.

**EGYPTOLOGY AND TOURISM**

Mundane problems of this sort may be a mystery to those who grew up with a traditional Central European education, in which a latent Egyptomania is still definitely present. The latter view of the land on the Nile is nourished not only by romantic enthusiasm and assimilation, but also by a certain conception of the scientific study of Egypt. "It's an Egyptology that doesn't take place in
Egypt, says Stephan Seidlmayer. An Egyptology that can’t speak or read Arabic, because it considers Ancient Egypt to be something completely finished that couldn’t possibly be connected in any way with the present day. The hieroglyphs had been deciphered, the tombs opened, the finds sorted – and one had retreated to the library. The DAI has been in Cairo for 106 years. People who work there, embedded in everyday Egyptian life, have no chance of avoiding the mundane problems. “That’s why it’s absolutely essential to keep going, especially now, to carry on receiving the Egyptian economy and its significance in the formation of identity in Egypt and Europe. The institute possesses the second largest archaeological library in Egypt in addition to archives and its own publication department, making it an attractive port of call not only for specialists. Conferences and public lectures are regularly organized and well frequented. By granting scholarships and holding lectures, the Cairo Department of the DAI contributes to the qualification of Egyptian researchers and promotes, in its projects and events, contact and exchange between Egyptian and German researchers.

He communicates this message to the Tourism Committee from the German Bundestag, which is paying a visit to Cairo. Tourism is one of the most important branches of the Egyptian economy, accounting for 10 per cent of the gross domestic product before the Revolution. The slump is especially dramatic at a time when the Egyptian economy is reeling as a whole. “As scientists we can show them prospects and opportunities in the field of culture,” the archaeologist tells the members of parliament. “And we can impart the one-sided reporting of the Western media only exacerbates the problem.


WANDERLUST

The institute’s library holds an exquisite collection of travel literature. A new series of books is aimed at a growing readership interested in the history of science and research in oriental countries, thus rendering the Cairo Department’s extensive archive material accessible.

The institutional origins of German archaeology in Egypt date back to 1907 with the founding of the Imperial German Institute for the Study of Ancient Egypt, a body that was incorporated into the German Archaeological Institute in 1929. Since 1957 the Cairo Department has had its headquarters in a 1930s villa in the district of Zamalek. In cooperation with the Supreme Council for Antiquities in Egypt and international partners, the DAI Cairo conducts research into all epochs from prehistory to the modern history of Egypt, its settlement and landscape history, the form and function of ritual spaces, and its living environments. Also, an important role is played by research into the reception of Ancient Egypt and its significance in the historical development of the modern state of the country.

The normality in which the protection of cultural assets is important, and which reveals how little sense of direction a country like Egypt can have in the present time without its 5,000 year history. “Pessimism is not an option,” Seidlmayer says with conviction – even though it can sometimes be hard work.

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INTERVIEW WITH STEPHAN SEIDLMAYER ABOUT ARCHAEOLOGY IN EGYPT TODAY

Archeology Worldwide: When the Foreign Office launched the Transformation Partnership with Egypt in 2011, the initiative was carried by an almost euphoric joy over the developments in some countries of North Africa and the Middle East. Was the celebrating premature?

Stephan Seidlmaier: It’s in the nature of revolutions that they are partly carried by illusions. One of the illusions on our side may have been to believe that everything would go much quicker. But a transformation as radical as that taking place in Egypt now is a process that simply takes time. That’s what the arduous business of day-to-day politics teaches us, and historical experience teaches us too. We shouldn’t give in to the temptation of only ever applying our own concepts in analysing the problems Egypt is facing.

From the viewpoint of the German Archaeological Institute there’s no alternative to continuing to implement all the points of the Transformation Partnership programme with Egypt. In fact, now is the time to show we are reliable partners. What’s important above all is to tailor the work to the needs of the country.

For example?

Seidlmaier: As archaeologists we are mainly involved in projects – in the framework of the Transformation Partnership – which are aimed at preserving cultural heritage and developing it for tourism purposes, ranging from archaeological site management to the drawing up of visitor plans for some of the major monument sites. As you know, tourism is normally one of the strongest sectors of the country’s economy but has totally collapsed. Another important project is the renovation and extension of the museum on Elephantine Island in the River Nile, near Aswan in southern Egypt.

How should we picture the archaeological work you’re doing at the moment?

Seidlmaier: Archaeology is always slow-moving, long-term, and difficult work, and there can be setbacks. That’s completely normal. And we know, of course, that archaeology and its exigencies aren’t top of the agenda when the priorities are your livelihood and survival. The problems are pressing, and experts fear that Egypt’s current economic policy could have disastrous consequences. When times are hard, you need patience and staying power. That’s the consensus of opinion among all the people working here – not only international colleagues but also, I’m very pleased to say, staff at the German Embassy in Cairo and the German partner organizations we work closely with.

What can be done to make it easier to survive these challenging times?

Seidlmaier: There are significant points of interconnection and interaction between Egypt and Germany, or the Western world in general. The “West” has absorbed a great deal from Egypt and vice versa. There’s a long tradition of mutual give and take – longer and deeper than one might think. We shouldn’t forget that we live side by side in a relatively small geographical space and ultimately belong to the same cultural system. Ideologies based on Kulturkampf and orthodoxies oblivious of history, on both sides, are not only very hazardous: they’re also historically wrong.

What relationship do Egyptians have with their own history?

Seidlmaier: That’s a really tricky issue. A particularly problematic circumstance is that the Egyptian elites are strongly foreign-oriented, turned away from their country, in their attitude to life. They set great store by a Western-style education; some families speak only English at home. As part of the Transformation Partnership, we’re in the process of putting together lesson material – in cooperation with the German school in Cairo – that will teach pupils about their own history. That’s just one example of the kind of thing we are able to do. Another thing is allowing Egyptian researchers and students unrestricted access to our library, which is the second biggest archaeological library in Egypt. Egypt simply can’t afford to have no consciousness of its own history, and it isn’t free to disengage itself from the reason for its existence. Working together on this task is therefore a key area in which the collaboration can be fruitful for both nations.

What are the biggest archaeological libraries in Egypt?

Seidlmaier: The biggest archaeological library in Egypt is the Cairo Department of the German Archaeological Institute since 2009.

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6,000 years before the building of Stonehenge, 7,000 years before the Pyramids, people created a place consisting of 20 circular structures with standing stones up to 5.5 metres high and weighing up to 10 tonnes – pillars cut with incredible precision from quarried stone without the use of metal tools, and decorated with relief carvings of animals, including aurochs, boars and flowers, ibis, cranes and vultures, scorpions, spiders and serpents.

Göbekli Tepe – “belly hill” – lies near the town of Şanlıurfa in southeastern Turkey. Contained within are more sensations than can be investigated in an archaeologist’s lifetime. The greatest sensation of all, however, is that the monumental Stone Age site with its monolithic T-shaped pillars will make us have to revise our ideas about the origins of what we understand today by the term civilization.

The hill was first surveyed in the 1960s but its significance was not appreciated. In 1994, DAI archaeologist Klaus Schmidt was the first to recognize just how extraordinary the place was. Since then, excavations have been in progress at Göbekli Tepe, conducted by the German Archaeological Institute (DAI) as part of a joint German-Turkish project.

The many animal reliefs on the pillars are not there without reason. For hunters and gatherers the area must have been a paradise.

The stone masons of Göbekli Tepe created the oldest architectural temples in human history.
Animal bone finds are plentiful and varied, indicative of rich game, and archaeobotanists from the DAI have found evidence of wild barley and wild einkorn. Situated at the northern tip of the Fertile Crescent, the region offered such good preconditions for life that it may have attracted hunters and gatherers from far and wide. The hill has now been investigated using ground-penetrating radar and geomagnetic prospecting. At least 16 more megalith rings still lie hidden under the earth. In a later phase the temple users erected smaller pillars inside rectangular rooms. Finally they abandoned the site, and the Romans were next to make use of it, building a watchtower on the hill that offered a panoramic view.

It was precisely this wide, unimpeded view, Klaus Schmidt presumes, that induced the builders of Göbekli Tepe to erect their temples there. More work at the site is needed for a better understanding of the structures' purpose. A link to a death cult is established by the discovery of individual human bones, and the iconography of the structures permits this possible interpretation. The depiction of arms, hands and garments on some of the pillars supports their identification as highly abstract representations of supernatural beings. At all events the stone masons of Göbekli Tepe created the oldest architectural temples in human history.

12,000 YEAR OLD WILDLIFE
Monolithic pillars weighing several tonnes are linked by walling, dividing "inside" from "outside" in the style of a temenos. In the centre of the circular enclosure stand a pair of pillars that tower over the others. Many unanswered questions surround the large-format reliefs of wild animals. Photos: Nico Becker, DAI Orient Department

CULTURAL REVOLUTION
The monuments on Göbekli Tepe are a source of testimony – unique in the world – on the history of the changeover from hunting communities to agrarian societies, and throw an entirely new light on the process. To the east of Göbekli Tepe stretches the volcanic landscape of Karacadag which natural science investigations have identified as the home of subsequently cultivated types of cereal. This raises the question whether the cult community of Göbekli Tepe, with hunting as their economic mode, may possibly have initiated the cultivation of wild cereal grains. Large quantities of animal bones, especially in the older layer of Göbekli Tepe where the monumental structures are, bear witness to big feasts that certainly were religiously motivated and served the purpose of bringing together a sufficient number of people to build the structures. Organizing the feasts would have overburdened the economic system of a hunting society very quickly. This may have been the reason why new resources were exploited – a process involving the domestication of plants and animals and leading ultimately to a totally new, food-producing way of life that characterizes the Neolithic period. Göbekli Tepe thus represents a window on one of the most fundamental evolutionary processes in human history.

CULTURAL HERITAGE
 visitor magnet
Göbekli Tepe is visited by an increasing number of tourists each year. Photo: BTU Cottbus

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Having lain buried for 12,000 years, the structures are to be protected from the elements by a canopy which is scheduled to be completed in 2014.

The assumption until now was that only sedentary and well-organized groups of people that moreover practiced agriculture would have had the time and the appropriate social structure with fully-fledged division of labour necessary for the building of temples – especially for one of such size as Göbekli Tepe. The latter site shows, however, that the opposite could also be true: that the collective effort to build such a mammoth complex is what laid the foundations for the emergence of complex societies. Large numbers of workers had to be fed and accommodated, wood had to be procured, rope and tools produced, water and food had to be carried by hand to the temple and the monoliths hewn from the nearby quarry and hauled there – a remarkable accomplishment for hunter-gatherers.

A PROTECTIVE CANOPY FOR GÖBEKLI TEPE

So far only a small portion of the ancient structures has been excavated, and the greater part still lies underground. According to the plans for future investigations at the site, research will focus above all on the sections that have already been exposed, and leave the remainder undisturbed until scientists can be sure that further excavation will not damage the architectural structures. So that this unique testimony of human cultural development can be properly documented, sensitively studied and above all protected, the DAI together with its Turkish partners and specialists from Cottbus University and from the Global Heritage Fund are drawing up a systematic site management plan that should furthermore support Turkey’s request for Göbekli Tepe to be inscribed on the UNESCO’s World Heritage List. Of particular importance is the erection of a protective canopy over the site, which lay well protected under the earth for 12,000 years and now is exposed to wind and rain. The canopy is expected to be finished in 2014. The overriding objective of all the projected measures is to create the necessary basis and framework for the long-term safeguarding of Göbekli Tepe as part of the heritage of humankind.
The best protection for a house is an intact roof with functioning windows and doors; beyond that, plaster and paint and indoor climate all kept in good condition. In the absence of this, a house will rapidly turn into an uninhabitable ruin. Water seeping through the roof will penetrate the walls, wooden floors will rot, iron will rust, mould will spread through the masonry, and the process of decay will advance ever further and ever faster.

This example may serve to illustrate what is a central problem in the preservation of archaeological monuments. Almost always the buildings of early civilizations are excavated without roofs, without floors, without a protective coping, or plaster, for the walls. Then they are left standing there — unprotected. And unlike a modern ruin, these buildings are intensively used. They are worn down, quite literally, by thousands of tourists. At Ephesus in Turkey it's as many as 1.5 million people who visit the site each year. The tourists walk on ancient roads and hotels, brings about the development of tourist infrastructure, e.g. faced with a complex challenge. It is be, responsible for these tasks are there— state heritage bodies which are, and must protect the ruins and the tourists too. The same time keep them off the ruins – to from the weather. They have to find ways to protect their ruins like egypt, Greece and Turkey consequent— Countries with large numbers of tourists want to stroll along the walls.

Countries with large numbers of tourists like Egypt, Greece and Turkey consequent— ly have to find ways to protect their ruins from the weather. They have to make them comprehensible for tourists and at the same time keep them off the ruins — to protect the ruins and the tourists too. The state heritage bodies which are, and must be, responsible for these tasks are therefore faced with a complex challenge. It is further complicated by the fact that the development of tourist infrastructure, e.g. roads and hotels, brings about the de—

The author, Friederike Fless, is President of the German Archaeological Institute. Photo: Lajune

ARCHAEOLOGY AND HERITAGE CONSERVATION

What role, and what responsibility, does archaeology have as a science? Basic standards were stipulated more than 20 years ago in the Valletta Treaty. This agreement requires that attention be given during the planning stage to the question of what will be done with the result of the excavation, i.e. the monument once it has been exposed. Even though the best protection of a historical monument is often its rebural, the wish to develop the site for tourism purposes must be taken into account. This also applies to the German Archaeological Institute’s excavations around the world.

Solutions here can only be found in close cooperation between the heritage authorities in the states concerned and the archaeologists working there. Scientific archaeology has an important role to play in this. It begins with the countries that host our research being supported in the task of documenting their own cultural landscapes, since it is knowledge about the situation of archaeological sites that facilitates their protection. In many countries the DAI is collaborating with local heritage conservation offices on documentation projects, bringing old archive documents and modern satellite images together according to their coordinates in digital systems (GIS). As for the sites themselves, excavators are obliged to draw up plans for their protection and presentation. The investigation of a site or a ruin is after all what creates the knowledge that makes it possible to explain it in a comprehensible manner and exploit it for tourism purposes. On this level, the duties of the DAI therefore derive directly from its scientific activities.

This is to be carried out jointly with the heritage protection offices of the countries concerned, and they must also provide most of the funding for implementation. Responsibility for relevant measures must lie with the heritage offices and their authority needs to be increased. It must be a central principle that part of the revenue from tourism is reinvested in the conservation of the tourist attractions themselves. A further strategy that may help here is the principle, practised in Germany, that the responsible party pays. So the organization that builds a pipeline or a hotel, for example, should finance the archaeological exploration that must precede construction.

The German Archaeological Institute has taken a number of measures to strengthen its own competences in this area. It has intensified the long-lasting and close cooperation with the German Foreign Office in the field of cultural heritage preservation and is currently in the process of re-structuring it. It has also increased debate about essential issues of heritage conservation, as is attested by a conference in Ankara last November and a round table discussion on site management and heritage conservation in the Mediterranean region with construction history specialists and experts from German technical colleges.

Above all, however, the DAI has set up an advisory committee on historical monuments and responded to the challenges that exist by creating a special new post for cultural resource protection and site management; Friedrich Lüth has been appointed to the post. We hope that by these measures we can fulfil our statutory tasks even better. Through its research, the DAI contributes to preserving cultural heritage and supporting cultural identity in its host and partner countries in Europe and around the world.
The way to the prosperous trading posts on the Silk Road led through endless gravel deserts in western China. Photo: DAI Beijing

Near the pole of inaccessibility grow China’s sweetest grapes, which when dried are the finest raisins in Asia. The way there leads through a landscape that seems to have been created by evil-tempered demigures who, their work half done, have taken up positions on the Altai or the Tian Shan Mountains, where they look on and sneer, “Let’s see how far they get.” The sheer endless monotony of the surroundings can be dispiriting; travellers need to make an immense effort to imagine the grey, rock-strewn desert ever coming to an end. Even the dazzling blue of the sky is monotonous, the air as dry as paper. They came far, and from a long way away. Just about everyone was here at some point, even the Turks long ago. From the north came the Huns, from the east the Han Chinese, to gain control of a now inhospitable region. From the Chinese point of view, it was always important who ruled the west. For them it was the gateway to the other worlds, for outsiders from the west it was the gateway to China and its treasures. Merchants came from Bactria and India, and the Roman desire for Chinese silks stimulated transcontinental commerce 2,000 years ago. Polyglot trading folk like the Sogdians, who came from the area that is today Uzbekistan and were active from Crimea as far as Korea, grew

GATEWAY TO OTHER WORLDS
German and Chinese archaeologists investigate unknown societies on the Silk Road
There are ancient links from this region via central and western Asia as far as Europe. The connecting elements sound contemporary: trade and technology transfer. The oasis of Turpan is located in one of the Earth’s deepest depressions, which itself adjoins its highest mountain range. The contrasts that shape the landscape here are not so close together as they are in Europe. Changes in the topography come more slowly, and then are all the more dramatic. 255,000 people live in the city today, most of them are Uyghurs. “We don’t exactly how old the oasis is,” says the archaeologist. “There’s no direct evidence about its origins, but the oldest accounts we know mention an old town.” Those accounts are from the 2nd century BC. Archaeological finds show that the Turpan Basin was inhabited by farmers a good 3,000 years ago.

The climate is extremely arid, and whenever rain does fall, it leaves hardly a trace on the road, and one’s clothes are dry again almost immediately. The water evaporates in seconds in air with very low humidity. Annual precipitation is about 16 millimetres per year. A good climate for the world-famous Turpan raisins – and for the preservation of objects made by human hand. At the trading posts on the Silk Road, a lot survives that has perished elsewhere. Mayke Wagner still remembers very clearly the moment she learned of a spectacular find that Chinese colleagues made in 2007. The sensation was an athleticism built man in late middle age, physically active until his death although he was actually an invalid. His age: 2,100 years old, and he was exceptionally well preserved. His left leg was bent back and angled inwards in such a way that he could not have used it, which in ordinary circumstances would mean the end of his livelihood. A stick or crutch would have helped him, but would have occupied his hands, which he needed for work. So he constructed a leg out of wood and fastened it to his thigh with leather straps – the oldest functional prosthesis in the world! The man belonged to a farming and pastoral community that inhabited the Turpan Basin and the eastern foothills of the Tian Shan at the time when Alexander the Great pushed eastwards and the Chinese Han Dynasty made its first expansion to the west, where they encountered central Asian societies of which very little is known because they did not record their history.
Now archaeology, medicine and geography are joining forces to puzzle out the way of life of the ancient population, analysing the exact functioning of the prosthetic limb and endeavouring to infer what technical knowledge the population possessed. The palaeopathologist Julia Gresky has discovered that the condition that caused the extremely painful deformity of the leg was tuberculosis, which occurred at various places in central and east Asia in the first millennium BC and is transmitted by cattle, which however were not native to the region. “So there must have been commercial contacts and migratory movements,” Mayke Wagner says. “Rich cereal finds in the graves allow us to conclude that the society to which the man with the wooden leg belonged was at least partly sedentary,” the archaeologist adds, correcting the general assumption to date.

The wooden leg is of course a spectacular exception. Another product of technical know-how is so familiar to us that we risk completely overlooking its ingenuity. The invalid, his relatives and neighbours, just like the travelling merchants, wore trousers, skirts and kaftans, boots, leather coats, examples of a ground-breaking primary technology: clothing. Shearing sheep, spinning yarn, weaving cloth and then converting that two-dimensional material into three-dimensional form to fit the human body required planning, mathematical skill and a notable capacity for abstract thinking, comparable to that in architecture. The clothing, too, had survived in good condition in the dry climate, and thus archaeologists were able in many cases to recover entire sets of garments from the first millennium BC from trading post sites on the Silk Road. Richly decorated and splendidly coloured, the garments provide testimony of the economic and settlement history of the region and are an expression of cultural and social identity, since clothing frequently revealed what it still does today: where the wearer came from and what social class he or she belonged to.
they work together. The number one topic for Chinese researchers is generally further educational opportunities for their children. Archaeological campaigns are scheduled according to school term dates. When a campaign comes to an end, the head of the Turpan tourist bureau invites the participants to dinner. He asks them to put in a good word for the oasis when they get back home. Hotels with lush vegetation await the visitor. They serve boiled lamb with rice and soured milk with ice cubes and sugar. Or a whole hokkaido squash filled with dried dates, figs and apricots, and baked or steamed in the oven.

Tourism is a hot topic, and great effort is being invested into making the ancient trading post a modern oasis of well-being. It has a gleaming city centre, an amusement strip with fountains to delight the flâneur, and a big new museum that already is a magnet for tourists. Public swimming pools and a paddling pond where young people can meet are a clear demonstration of the modern technological mastery of a scarce resource.

The archaeologists have to return to Beijing. Of course they do not have to spend weeks in the saddle to get there: instead three hours by car from Turpan to Urumqi, the capital of Xinjiang, and then four or five more hours in a plane or - soon - on a high-speed train to Beijing, away from the pole of inaccessibility. From the airport it is best to travel by Airport Express Rail and Subway Line 10 to the German Centre in the Landmark Complex, where the Beijing Branch of the DAI has its office.

With 16 millimetres of rainfall per year and promenades shaded by grapevines, visitors sooner or later ask themselves: where does the water come from? A feature that the untrained eye might mistake for a Bronze Age grave mound in fact turns out to be the entrance to a karez. The risk of confusion is especially high on the 54,000 m² cemetery of Yanghai, from which many archaeological finds originate - even though the entrances to the karez, unlike the grave mounds, are lined up in a row. While accessing water in a cemetery may seem a disconcerting idea, it is neither the result of chance nor a mistake. The old irrigation system is more than intelligent.

**CLIMATE AND HYDROTECHNOLOGY**

China's rapid economic development has led to remains of past epochs being discovered and excavated in great quantity. The demand for archaeologists is rising steadily and the number of archaeological institutes, training centres, historical monument bodies and museums is on the increase, too. The preservation of cultural heritage is a top priority in China, and the country's highly developed archaeological sciences are responding to the challenges that this entails. Interest in cooperation with institutions abroad is growing constantly, particularly among younger scientists with international work experience. Cooperation partners are sought worldwide for restoration, find evaluation, laboratory analysis, palaeopathology, archaeozoology and archaeobotany as well as for access to international publications. In exceptional cases China opens its sites to archaeologists from abroad, so that they can work on originals.

This kind of thing is rarely a topic of conversation between Chinese and German archaeologists, however, on the occasions when they work together. The number one topic for Chinese researchers is generally further educational opportunities for their children. Archaeological campaigns are scheduled according to school term dates.

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River gods are a common motif on the coins of ancient cities. The people of the time knew how much they owed to rivers: their drinking water, the water for irrigating their fields, and also the fertile earth that the rivers deposited at estuaries. Big rivers were used as transport routes; wood felled in trackless mountain forests could be floated down mountain streams to the coast. In terms of iconography rivers were frequently depicted as mature men of ripe years. Generally these anthropomorphic river gods hold a reed stem in their arm and often also a horn of plenty that symbolizes the fertility that they engender. Now and then, coins bear face designs of river gods whose exact significance can only be deduced through scientific research. That is the case with the coin minted by the Black Sea coastal town of Amastris in Asia Minor – today Amasra in Turkey – in the Roman imperial period.

On the obverse of the coin there is the head of a bearded man whom a Greek legend identified as Homer. The reverse side shows a river god reclining in a relaxed posture, his body and head facing to the left. His upper body is naked, his lower body covered by a robe. His left arm rests on an amphora out of which water flows; he holds a branch, perhaps a reed. His right leg is drawn up and on the knee there rests an ancient stringed instrument, a kithara. Beneath the river god stands “Meles” in Greek letters, above him the name of the citizens who issued the coin: “[coin] of the Amastrians”.

The coin reflects the search undertaken in antiquity for the place of Homer’s birth. Since nothing could be established about where the greatest of Greek poets came from, very many communities – including Smyrna, Kyme, Chios, Ithaka, but also Athens and Rome – asserted, some with more persuasive arguments than others, that Homer had either been born in their city or had at least passed through it on his travels. The claim raised by Amastris derives from the fact that Homer had originally been named Melesigenes, i.e. “born on the Meles”. On the territory of Amastris there was a river called Meles – and the Amastrians identified it with Homer’s birthplace. The kithara on his knee is thus a reference to Homer’s poetic art. Their location on the fringes of the Greek world did not prevent the citizens of Amastris from claiming Homer had been born there. The scorn which Hellenes from the motherland and from highly cultivated Ionia poured on the uneducated and idiotic Greeks from the Black Sea coast only spurred them on to call Homer, linchpin of all Greek learning, a native. As such, this coin is at once a claim and a provocation.
When you live in one of the most water-rich countries of the world, it can be hard not to take water for granted. It’s so easy to access the resource without which nothing is possible. Severe drought that could lead to water shortages may occur – in Germany – once in a lifetime, if that. Yet in many regions of the globe, of course, water is a very scarce resource. Rising demand, questions of access, of distribution and services, cross-border water management, the financing of water, national and international legal frameworks – these are issues that directly affect all of humanity and are becoming ever more acute. Which is why the General Assembly of the United Nations has designated 2013 the International Year of Water Cooperation.
Water has been an important factor in all phases of human history, and its exploitation by technological means goes back to the time complex forms of settlement and society first start to appear. Strictly organized water management was at the root of the great river-valley civilizations on the Nile, Euphrates or Yangtse, and water’s role as a maker of society has led to the coining of the term “hydraulic societies”. In the arid parts of the Arabian Peninsula the use of well technology, introduced some 6,000 years ago from the Levant, triggered the emergence of a completely new way of life, the Oasis Culture. Technological, social and cultural innovations had to mesh if they were ever to be effective.

WATER AND INNOVATION

That innovations are characteristic of our own times is one of the self-attributions of the modern era. It is commonly supposed that antiquity was static, throughout its span, and that ended long ago. An innovation is an invention that has succeeded in establishing itself on the market, modern economists explain. Or it’s something that is so self-evident that we don’t give it any thought. Water as a utility in an average central European country is hence a kind of innovation.

After all, who asks now how it’s possible for water to come out of the tap on the top floors of a high-rise building? Who wants to know where it actually comes from, how it’s collected or found? Is it all rain water, or does it come out of groundwater wells? And if it does, how are they constructed? How can we know where water might be when it doesn’t emerge at the surface? And what should we do when there’s suddenly much too much water and it threatens to sweep everything away? Who, moreover, decides where wells or water pipelines are to be sited, and who is in charge of them? Who does scarce water belong to, and who is allowed to distribute it or sell it – and to whom? Drawing water from nearby rivers or lakes is the easiest method of procuring it. Water that only flows underground must first be detected; and if it is to be transported from A to B, technology is required, whether it’s for simple ditch networks, conduits or the latest high-pressure pipelines – ecological and hydrological knowledge is indispensable.

The first well was dug in the 9th millennium BC on Cyprus. The know-how allowed a rapid expansion of permanent settlements that were not sited in the immediate vicinity of springs and rivers. As societies grew more complex, they built canals, aqueducts, dams and elaborate irrigation systems. The more crops a community planted, the bigger and wealthier it could become. When more highly differentiated societies evolved, ruling classes emerged that utilized the hard-to-master element either for reasons of state or for the projection of power and majesty through conspicuous extravagance. And without water it is impossible to imagine the myriad different cults in which higher powers, in all regions of the world, were asked for prosperity, fertility and a long life.

In an interdisciplinary approach, the German Archaeological Institute is conducting a large number of projects that look at ancient water management in terms of its natural preconditions and human modifications. Archaeology as a historical science studies the cultural framework of ancient societies; its cultural studies methodologies analyse the exact character of the innumerable forms of human communities; and in cooperation with several natural science disciplines, it reconstructs the subtle mechanisms and processes by which mankind and the environment influence each other.
The climate is very dry, and the sight of the oasis evokes a cliché: the well in the centre of town, and gardens full of palms. The connotations of the word “oasis” easily conjure up the misleading image of a remote and sleepy village, deserted but perhaps for a dosing camel.

The images may be attractive, but there’s little romance in the history. Oases’ histories tend to be about brilliant invention and technical innovation, efficient social organization and international trade relations, business and fierce competition – since an oasis needed customers. Caravans traversed the desert with hundreds of animals that had to be watered every few days. That brought in money. If a caravan took a different route, the oasis could face (pardon the pun) liquidity problems.

So nothing could be farther from the truth than the notion that the oases of the Arabian Peninsula, in antiquity, were sleepy places. Rather, if their success proved lasting, they grew into territorial powers that redrew the geopolitical map of the region. Early in the 4th millennium BC, Oasis Culture spread from southern Jordan towards the south and the south-east: into the arid areas south of the Fertile Crescent on the Arabian Peninsula. Tayma in north-western Saudi Arabia and Marib in Yemen are examples of prosperous oases that once were important staging posts on the Incense Route.

The herdsmen who arrived at the oases in the 4th and 3rd millennia saw horticulture and agriculture being practised, found wells for drinking water and field irrigation. From the 2nd millennium Tayma and Marib evolved into politically and economically central places, hubs in trade and transport; both were involved in supra-regional political developments and came to the notice of the “superpowers” of the day: Egypt, Assyria and Babylonia or Greece and Rome. Year-round occupation – a prerequisite for this evolution – was possible thanks to the mastery of basic techniques of hydraulic engineering.

Archaeologists of the DAI have been collaborating for several years with geo-archaeologists, hydraulic engineers and hydrologists to investigate these early innovations.

**Marib and Tayma**

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Marib – economic centre of the Kingdom of Saba

The oasis of Marib in what today is Yemen was the lifeline of a major caravan kingdom of the 1st millennium BC. Here emerged a widely famed civilization rich from the trade in incense and perfumes: Saba. Its wealth was founded upon intensive agriculture capable of supplying not only its inhabitants but also the caravans. The archaeologist Iris Gerlach is conducting research into the origins and evolution of the Sabaean Kingdom with its capital at Marib. A pre-eminent role in Saba’s fortunes was naturally played by sophisticated irrigation technology.

Saba was the most important oasis culture on the eastern edge of the Yemen Highlands. From the 8th century BC onwards it developed into a territorial state. Ancient sources tell of Saba’s legendary wealth. This was manifested in opulent temples and other grand buildings, the remains of which have been seen today. Saba’s control of the trade in frankincense and myrrh was not the basis, but also the caravans. The Sabaean Kingdom with its capital at Marib – economic centre of the Kingdom of Saba. Its wealth was founded upon intensive agriculture capable of supplying not only its inhabitants but also the caravans. The archaeologist Iris Gerlach is conducting research into the origins and evolution of the Sabaean Kingdom with its capital at Marib.

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This prosperity was never secure. On the one hand if the flood waters were too high, the irrigation facilities could be destroyed; on the other, the fertile sediments that were washed onto the fields twice yearly themselves jeopardized the enterprise in that they caused the surface of the fields to rise continuously by about one centimetre per year. This reduced the flow gradient in the canal system that was necessary if the outlying parts of the oasis were to be supplied with water too. In consequence the dam and the outflow structures repeatedly had to be made higher. The Great Dam of Marib presents itself to archaeologists today in the form it acquired in a late construction phase that dates from towards the end of the kingdom of ancient South Arabia. The construction work is attested by inscriptions from the 4th and 5th centuries AD.

A greater problem still was posed by political and social changes taking place in the region. The Ethiopian conquerors of the Sabaean Kingdom had to compel the people to carry out vital maintenance work on the irrigation system. In the absence of a strong political consensus, all systems crumbled over time – and at the beginning of the 7th century the Great Dam was breached. That was the end of the oasis of Marib.

THE GREAT DAM

By the late 8th century, the Sabaean had developed their skills to the point where they were able to embark on the most difficult project in their irrigation system. Completed in the 6th century BC, the Great Dam of Marib blocked the wadi across its entire width, making it possible to use virtually all the flood water for irrigation and also to significantly extend the area under cultivation. The purpose here was not storage, as is the case with modern reservoir dams. Rather, the wadi was dammed, then fed into the/irrigation system. In this way the fields could be flooded in a controlled way. The Great Dam of Marib was a 600 metre long, nearly 100 metre wide and approx. 20 metre high earth dam with stone cladding. At either end were sluice-gate buildings erected directly on the bedrock so as to prevent their foundations from being washed away. The thresholds of these sluice structures lay high above the level of the fields, but still considerably below the crest of the dam. When the water reached the threshold, it flowed through into a stilling basin, where it slowed and settled so that it could be fed into the network of channels. The primary sluiceway conducted the water to the distribution tank. From here, at a very slight flow gradient of one to two per mill it ran through the perforally branching canal system and reached the fields, which measured approximately one hectare. Flooding a field once to a depth of half a metre was enough to guarantee a harvest. For a period of 1,000 years, this technology enabled the Sabaean to transform a hostile environment into a fertile oasis. Almost 10,000 hectares of arable land were cultivated. Marib at this time was the largest artificially created oasis landscape in southern Arabia.
Tayma, an urban centre in the desert

Tayma is one of the most remarkable archaeological sites in Saudi Arabia and the Near East. Inhabited by a sedentary community from the 3rd millennium BC onwards, the site is known from the Bible and cuneiform literature above all as a trading centre. Over time, the simple oasis settlement grew into a power centre endowed with public buildings and extensive residential quarters and even a large perimeter wall erected around the city in the 2nd millennium. At this time there were already contacts with Egypt and the Levant. Later the last Neo-Babylonian King Nabonidus (556-539 BC) transferred his residence here for ten years, as rock-cut inscriptions in the surrounding area show. In the early Holocene, a large lake lay directly north of the later settlement and dried out as a result of climate change starting in the 6th millennium BC. The lake might have been what brought people into the area.

Ricardo Eichmann and Arnulf Hausleiter are among the first foreign archaeologists to be able to carry out research at the oasis of Tayma in modern day Saudi Arabia, doing so in cooperation with the Saudi Commission for Tourism and Antiquities. This is very fortunate as Tayma exemplifies with exceptional clarity the emergence of oasis cultures and their evolution into politically influential regional powers.

The water needs of the ancient oasis of Tayma were primarily supplied by ground water procured from wells and from a spring pool. Passing through an intricate system of irrigation channels, this water made it possible to grow enough crops to feed a sizeable population; and additionally it was used to water the pack animals of the great caravans that stopped there.

Tayma’s elaborate irrigation system is being studied by DAI archaeologists together with experts from Lübeck University of Applied Sciences in a project that combines geoelectric and geomagnetic investigations with excavation and survey work. How the ancient wells functioned can be deduced from the wells that remained in use at the oasis until the middle of the 20th century. At the biggest wells the water was brought to the surface by means of a deflection pulley system drawn by camels – until diesel pumps took over the task. The biggest well in Tayma, the ‘Bir Haddaj’, has a diameter of 18 metres. So far, researchers have found more than 80 wells in Tayma. Why the oasis decreased in importance when water appears to have been plentiful is a question that archaeologists and hydrologists are now seeking to answer. How much water could the wells supply? What was the rate of flow? Was it enough in the long term to supply the caravans, which sometimes consisted of hundreds of camels? Or were there perhaps conflicts about who was allowed to sell the water and to whom it could be sold?

Tayma was used to irrigate the palm-tree oasis of Tayma. The water was drawn from the well with the aid of camels. Photo: DAI Orient Department, Hausleiter.

THE HISTORY OF TAYMA

Even though occupation of Tayma began as long ago as the 3rd millennium BC, the name Tayma is first mentioned in a text from the area of the Middle Euphrates. This was the period when Tayma was obliged to pay tribute to the Assyrian King Tiglat Pileser III, who reigned from 745 to 726 BC and who had made Assyria into a hegemonic power in the region. The text names Tayma in connection with a trade caravan; and also in later traditions, for instance the Biblical tradition, Tayma is generally referred to as a commercial centre. We know that, in Neo-Babylonian and Achaemenid times too, Tayma was integrated into the various supra-regional political entities; yet in spite of new cuneiform finds at the oasis and the already known testimony from the Achaemenid period, the exact nature of this integration remains unclear.

Between the oases there was not only busy contact but also intense competition. Particularly during the later centuries of the 1st millennium BC, relations between Tayma and the neighbouring oasis Dedan (today Khuraybah) became fiercely competitive. Finally the kings of the Liyante dynasty of Dedan seized the political domain and the sanctuaries of Tayma by putting up inscriptions and erecting statues in a temple. At the same time the size of the settlement shrank – a sign of power shifting in the region. Tayma fell under Nabataean, then Roman-Byzantine influence. Later, Tayma played an important role as a diffusion point in the Islamization of the Levant. Before that it had hosted a significant Jewish community, while in the 11th century Tayma was still known as a wealthy place with a big city wall.

The water was brought to the surface by means of a deflection pulley system drawn by camels – until diesel pumps took over the task. The biggest well in Tayma, the ‘Bir Haddaj’, has a diameter of 18 metres. So far, researchers have found more than 80 wells in Tayma. Why the oasis decreased in importance when water appears to have been plentiful is a question that archaeologists and hydrologists are now seeking to answer. How much water could the wells supply? What was the rate of flow? Was it enough in the long term to supply the caravans, which sometimes consisted of hundreds of camels? Or were there perhaps conflicts about who was allowed to sell the water and to whom it could be sold? 45
EVERYTHING FLOWS

Water luxury in antiquity

Rome and Córdoba

Sometimes things seem to be like in second-rate films. Roman emperors dissipated vast sums on themselves and their household, wallowing in luxury that knew no bounds. Caliph, duty-bound to display their wealth and power, zealously hosted dazzling banquets at which wine would flow like water. They and their ilk, whether rulers or simply rich men, had funds at their disposal that permitted them to control an element that was wilful and mighty itself. Addicted to luxury, made delusional by their power, and anxious to impress their few friends and many enemies, they didn't want to meet water half way: they wanted to command it. Water has always played a key role in the ostentatious display of power.

Water for the emperor

The Palatine Hill was Rome’s district of government, the centre of power of the empire that held sway over the Mediterranean world. Palatine is the etymon of the word “palace” and that is exactly how one should visualize the architecture there. Since 1998, the construction history specialist and architect Ulrike Wulf-Rheidt has worked on a variety of projects relating to the Palatine – in cooperation with the Soprintendenza Archeologica di Roma and often also with experts in construction history and surveying from the DAI’s cooperation partner, the Brandenburg Technical University in Cottbus (BTU). Hydraulic engineering was nothing new in the Empire 2,000 years ago; the aqueduct was a familiar technology and an exclusive branch conduit of an aqueduct kept the imperial palace constantly supplied with an abundance of water. The water was brought via aqueduct to the highest point and then distributed to lower-lying areas. Still it was an enormous technical challenge to impel water to the top of the Palatine and feed it into the intricate system of lead pipes that supplied the many and various constituent parts of the palace complex – and finally to channel it out again. The technology was so sophisticated indeed that the discharge of...
many fountains could be adjusted from a soft plashing to a loud roar. There were water stairs, waterspout fountains, large pools and artificial lakes which helped to cool the palace in the hot Roman summers.

In the “Sunken Peristyle” – a lower-level courtyard framed by columns – in the Domus Augustana there was even a pool deep enough to swim in (and directly connected to the latrines). The facilities were ornately decorated and framed by statuary – proper wellness temples. The big basin of water in the courtyard was graced with an artificial island that could be reached by bridges. Lavish banquets were held there. In the Domus Severiana there was another gigantic pool, built on a 20 metre high substructure and extending right to the foot of the halls. From there the emperor’s guests could gaze out over the expanse of water and – shielded from the noisy, hectic city – give themselves up to the illusion of being at one of the popular lakeside villas.

We now know the palatial ensemble of the Palatine so well because the construction history specialists of the DAI have managed to complete a comprehensive and detailed documentation of the architectural remains in a combined approach employing several measurement methods. As well as traditional tacheometry with reflector, they used reflectorless tacheometry, photogrammetry and laser scanning in addition to the tried and tested method of measurement by hand. Following computer-assisted processing, the measurement data are available for use in three-dimensional models of the imperial palace, with the help of which we can gain a sense of a former magnificence hardly suggested by today’s ruins. It turns out that the display of imperial majesty was much more calculated and complex than previously supposed – as were the multifarious and ingenious waterworks.

It wasn’t the caliph himself who owned the villa but his finance minister, al Durr “the Small”, a man from an affluent and influential family who desired to make a statement about himself. So, starting in 965, he spent his fortune on building his Munyat al-rum-manja, the “villa of the valley of pomegranate trees” not far from Córdoba. He wasn’t able to enjoy it for long, however, because he fell out of favour for embezzling state funds and could only save himself by presenting the estate to the caliph as a gift and holding a great feast.

At that time, Córdoba was a powerful city that enjoyed considerable freedom in the arts and commerce, and it was a spiritual paradise at one’s feet
centre of the Islamic world and beyond. The entire city was laid out like a chessboard, with streets running at right angles to one another, and with house, courtyard and garden arranged in rectangular and orderly fashion. And each house had a well.

“At al Rummaniya one had more,” explains the construction history specialist Felix Arnold, director of excavations at the villa. The showpiece of the estate was a monumental water basin 50 metres in length, 30 metres wide and four metres deep, one of the largest in the Islamic world. The basin was lined with masonry which was then plastered and polished. The basics of irrigation were known from Roman times, and no secret was made of the wish to build it “like the Romans”. And yet archaeologists were impressed by a particularly ingenious system they discovered here.

The outlet pipes of the great basin ran underneath the hall. This brought with it associations of the tree of life and of paradise, the life-giving element seeming to spring directly under one’s feet.

The daily water requirement was met by a mountain spring whose water was brought to the villa by a system of channels. The local springs were not the chief source of al Rummaniya’s paradisiacal water, however. It came from the sky – in downpours that were few but torrential. How exactly the whole system functioned, the archaeologists and construction history specialists do not yet know. In early summer 2013 work is set to recommence, and one of the questions will be: how was the garden irrigated?

WATER MUSIC
The combination of different techniques of procuring, storing and distributing water shows how highly skilled the planners were. Rain water from winter storms that ran down a mountain stream bed was skillfully re-routed to the basin. To this end, the stream was most probably dammed by means of a wall on its upper course, and the water was channelled out down a sluice. The sources on the estate itself were equipped with stone-built fountains to make it easier to draw water. There was even a subterranean seepage gallery – a horizontal well that collected groundwater from the nearby mountains.

A cistern provided the water for drinking, while the great basin possibly served to water the plants. The water basin also acted as a natural air-conditioning unit for the banquet hall, which was situated between the basin and the lower-lying terraced garden, and through which a gentle breeze will have constantly blown. The basin was not used for swimming, but musicians in boats would play for the guests.  Felix Arnold

EXCAVATION OF THE WATER CONDUIT
Archaeologists have exposed parts of the conduit that channelled water from the great basin to the garden. Remains of the Islamic garden were uncovered beneath a thick destruction layer. Photo: DAI Madrid, Arnold

THE GREAT BASIN TODAY
The walls were built of carefully laid bricks and then plastered with lime. A coat of purple paint imitates Roman opus signinum, a waterproof paving material. Photo: DAI Madrid, Patterson

AL-RUMMANYA NEAR CÓRDOBA. Reconstruction of the estate (965 AD). Three terraces were occupied by an olive plantation; on a fourth stood a luxurious summer residence. Drawing: Felix Arnold, DAI Madrid.
It wasn’t “just” a pyramid, raised up on the desert sands. That would have been colossal enough but in fact it was a great deal more: what Pharaoh Snofru engaged in here was landscape architecture on a truly grand scale. Nothing about the ensemble was natural: even the causeway leading up to the pyramid – the first of the pyramids – is artificially raised, the landscape modified: the natural evolution of the terrain, with its erosion channels carved by wind and rain, has been interrupted. But with normal terrain morphology it isn’t possible to detect the human imprint on the relief. Here fractals can help...

Comparably massive modifications of the Earth’s surface, discernible only from a great height, and of such dimensions that – like the pyramids – they have given rise to speculation about supernatural or extraterrestrial involvement, are to be found in the ancient past of the Americas, too, in southern Peru. The giant geoglyphs of Nazca can be deciphered, their true origin and function understood, with the aid of advanced natural science technologies such as magnetometer prospection, geoelectric prospection and photogrammetry. And it turns out they had much less to do with aeolian influence than with water, for in the culture where they arose, everything revolved around water.
Fractal landscapes at Dahshur

A pyramid alone is no longer an object of research in modern archaeology. It is seen as one part of a whole, as a man-made work set within a specific natural environment which has been shaped by man but which exerts an influence itself too. Archaeologists from the German Archaeological Institute under the direction of Nicole Alexanian from the Cairo Department are working with geoscientists from Freie Universität Berlin on a reconstruction of the landscape at the excavation site of Dahshur. Fluvial erosion and the human hand were the landscape architects at Dahshur. Water traced many branching paths across the terrain, while the huge building site at Dahshur created roads and transport routes which could be reinforced by natural erosion or could lead to additional material accumulating. To tell the one from the other after such a long time and underneath so much sand is not always easy. The geoscientists had an idea. The natural fractal pattern of the erosion channels leads to a fractal topography where fluvial processes are the principal factors in the formation of the terrain. Using a digital elevation model it is possible to determine the fractal nature of the natural erosion channels.

A HARBOUR FOR THE PYRAMID – HARBOUR BASIN WITH CAUSEWAY

In Snofru’s day, the course of the Nile lay some 500 metres further to the east. Most likely one arrived by water at the pyramid’s harbour, which had a genuine function here, whereas the harbours at other pyramids were often only symbolic. A causeway led from the harbour to the valley temple, and another from there to the pyramid. Since the harbour basin and the surrounding structures are buried under a layer of sand seven metres thick, the archaeologists first did magnetometric surveying in order to establish a starting point for the search (above).

Photo: DAI Kairo
everything revolves around water. It is like the "great spirit" that soars above everything. Water is the central subject of the world-famous geoglyphs in Peru, named the Nazca Lines after the nearby town. Dead straight lines up to 20 kilometres long, triangles and trapezoid shapes, large, even gigantic figures representing humans, monkeys, birds and whales are scored into the earth a few centimetres deep. Much has been written and said about the possible purpose of these enormous works of art, the first of which were created in the period of the Paracas Culture between 800 and 200 BC – considerably earlier than originally assumed. But to unravel their mystery, the researchers had to go back to square one.

Markus Reindel from the Commission for Archaeology of Non-European Cultures (KAAD) of the DAI has directed the research work in southern Peru since 1996. The research forms part of the DAI’s collaborative project entitled “Andes Transect”.

The researchers approached the problem from an angle different to previous investigations, deciding to search for the settlements that must have accompanied the geoglyphs. Without a cultural context, technology cannot be understood and its purpose cannot be determined. And no archaeologists today do fieldwork in the desert.
GEOGLYPHS on a mountain slope near Pañac. They can be attributed to the Paracas Culture (800–200 BC) on the grounds of their stylistic similarity to textile motifs.

without research methods that employ modern technology. In cooperation with the Swiss Federal Institute of Technology, Zurich (ETH), photogrammetric measurement was carried out in order to create a virtual aerial view of the giant geoglyphs.

This approach uncovered one sensation after another. Reindel and his colleagues found petroglyphs that were older than the geoglyphs, and the same design motifs appearing on textiles too, and in consequence had further evidence that the geoglyphs dated from the Paracas Period. Furthermore, on top of the geoglyphs they discovered buildings that contained votive offerings like crop plants, pottery, textiles and above all spondylus shells, a precious commodity that came from far away and is associated with water and fertility cults everywhere it turns up. Today we know that the fertility rituals were occasioned by periodic climate variations.

Since time immemorial, water has been central to all cultic activity in the region and crucial for habitation and migration movements. If climate and landscape change, the settlements move. If an elevated site is inhospitable, the people move to the coast. If it gets too dry there, the settlements shift back to the mountains. Traces of human occupancy can be found up to an altitude of 5,000 metres; people adapted to, and exploited, the natural conditions as best they could. When it once again became drier in the mountains, the water rituals were intensified, more lines and figures were cut and more shells procured. When it became ever drier, the inhabitants realized their efforts were in vain and they went away.

ANDES TRANSECT
The research into and documentation of the geoglyphs is part of the collaborative project “Andes Transect” which is investigating pre-Spanish environmental and cultural developments with the aid of the latest natural science and archaeological methodologies. The area of investigation lies on the west side of the Peruvian Andes between the Pacific coast and the western edge of the Andean Plateau. In a four-dimensional research project the interactions between mankind and the environment in the course of pre-Columbian history are being analysed. How did the autochthonous societies of South America cope with situations of radical change brought about by nature? Did the latter provoke or accelerate cultural developments? How did new forms of coexistence in society come into being? The paradigmatic conditions in western Peru under which these processes took place promise to contribute fundamentally to an understanding of human and societal development. Researchers with a natural science and a humanities background are collaborating closely in the investigation of human, cultural and environmental history in the study area. In all the research one thing has become abundantly clear: it’s always about water.

Archaeologist Dr. Markus Reindel conducts the research project in southern Peru in cooperation with a team from the Institute of Geography at Heidelberg University led by Prof. Dr. Bernhard Eitel.

VIRTUAL AERIAL VIEW In cooperation with the Swiss Federal Institute of Technology in Zurich (ETH), DAI archaeologists conducted photogrammetric measurements to create a virtual aerial view of the giant geoglyphs. Photogrammetry is a method of calculating distance and allows the position and form of objects to be determined from ordinary photos and accurate survey photos.
Iris Gerlach first visited Sana’a in Yemen in 1994; her first visit to Yeha, Ethiopia, followed in 1997 with a travel grant from the German Archaeological Institute. “I stood there in front of that monumental building and wondered even then in what way the two regions might have been connected in antiquity.” Key decisions regarding her professional life had already been taken; her studies of Near Eastern archaeology, Classical archaeology, Assyriology and Byzantine art history is a manifestation of her passionate interest in the merging of cultures, their ideas and art, and trade contacts. The Near East in general, southern Arabia and especially Yemen in particular, are the regions in and on which Iris Gerlach works. The “monumental building” she refers to is the Great Temple of Yeha in Ethiopia, with which sharply defined self-contained features are never some-thing mobile, not to say globalized, individual societies of the ancient world were, the archaeologist points out.

“I love this profession,” she declares out-right. It was always a goal of hers to direct an excavation. She has learned most of her Arabic in the field — but what about all the travelling between Berlin and Sana’a? “No, that’s not a problem,” she says with a laugh. You have to be open towards the land you work in, she says; you need to possess diplomatic skills and to know what’s acceptable and what isn’t. “Before you begin to make judgements, you should have lived in the country for a while first.”

Iris Gerlach is also involved — above all as an archaeologist — in a number of developmental and cultural policy projects. “The potential of archaeology when it comes to development policy hasn’t been properly recognized yet,” she notes. In many places, excavation licences are anyway granted on condition that a master plan is drawn up for the restoration of ruins and the development of tourism at a given archaeological site. That can include local people being trained as tourist guides, for example. Joint workshops on restoration methods or excavation and surveying technology are a way to create sustainability. In the construction of the museum in Yeha, stone-working and plastering techniques are being taught as a craft. The women of the region produce pottery by traditional means, and in the process are learning how a business can be made out of it. “Archaeology isn’t only important for the preservation of cultural identity,” Iris Gerlach says. “It can also create jobs and provide a livelihood for the local population.”

Archaeologist Iris Gerlach has been director of the Sana’a Branch of the German Archaeological Institute since 2000. Photo: Wannenmacher

FRIEDRICH LÜTH

Cultural resource protection: the term is quite a mouthful and denotes an art of great complexity in a field where simple concepts don’t get you very far. “Cultural heritage management is only conceivable and practicable in an international context,” says Friedrich Lüth. The archaeologist is special representative for the protection of cultural resources at the German Archaeological Institute, whose tasks include the investigation and protection of cultural heritage worldwide.

Where does it come from, this need to preserve cultural heritage? “It was initially a concern of elites, who are interested in their family history, in which they seek self-assurance and legitimation through a rootedness in history,” Lüth explains. In Germany, the first law on the protection of ancient monuments was passed in 1876, and throughout the 19th century interest in antiquities rose, whether originating in a search for a homeland or a quest for adventure in far-away places or a desire to find answers to age-old riddles.

For Friedrich Lüth, the love of old things began at school. The grammar school in Lüneburg taught Latin and Greek, and then came a holiday job at an excavation on the local heath. “That got me hooked.” What to study at university was an easy decision: prehistory and protohistory, followed by geography. Lüth’s archaeological scope became ever wider: “Slowly but surely I got settled in the Orient.” He worked for many years in Lebanon, Yemen, Iraq, but also in France, Great Britain, Greece and Germany.

Finally heritage conservation emerged as the chief focus of his work. He has headed various departments in heritage bodies of the German federal states, and chaired the state archaeologists’ association from 1993 to 2006. Since the foundation of the Europae Archaeologicae Consilium (EAC) he has been internationally active in the protection of ancient monuments. The council is a forum for discussion on a European level, which is very much in accord with how Lüth sees his own role. “There’s not just one way of doing things,” he says. “But we can and should agree on standards.” Isn’t some of the magic of archaeol- ogy lost, submerged in all the paperwork and red tape? “I’m very happy to be called a scientific manager,” he states. “But certainly it’s important not to focus entirely on managing the affairs of the inner circle. What matters most is communicating with the outside world.”

Lüth doesn’t much care for the term “protection of ancient monuments”: “Too backward-looking. And neither is it what we do these days.” Today, we think more in structures, he explains. We see people in their “built environment”, as inhabitants of a cultural landscape. And what used to be called the protection of ancient monuments is better termed change management. “Cultural resource protection is not about conserving moments in history,” says Lüth. “Change is part of it, too. Nobody would seriously want everything to look like it did 2,000 years ago.” Besides, pragmatism can help here and there to correct an overly romantic view of ancient things: “If you have some ruins and place them under protection, they need to be looked after. To be able to finance that, they have to be made part of existing value chains.” And what can’t be used still has to be paid for by someone.

Cultural preservation, therefore, isn’t “just” a science. In addition to that, cultural preservation is always a – sometimes highly charged – political, social and economic issue which often requires mediation when you have to reconcile opposing interests and strike a balance between the needs of people today – for housing space in growing cities, for example – and, on the other side, the equally justified desire to preserve what is ancient, because that serves as a point of reference in identity forming and historical self-assurance in many of the countries where the DAI operates. Not only that, it’s also a key sector of the economy. “Drawing up a tourism development plan is supremely important at many DAI excavation sites,” Friedrich Lüth says. “Tourism is the fourth strongest branch of economic activity worldwide, so it makes sense.” And we’re not only talking about pyramids or peristyles. The same is true in places much closer to home – for instance on the Baltic coast, where archaeologists are investigating the region’s underwater cultural heritage as part of the 12 year Sincos Project. Friedrich Lüth, who chairs the Cultural Heritage Monitoring Group of the Council of the Baltic Sea States, laughs: “There was no end of Vineta...”
At 50 degrees in the shade the thermometers stop working, but shade is scarce in Wallachia, southern Romania. It is high summer, and as every year at this time the archaeologists have returned to the village of Pietrele. The local school serves as an expedition house during the holidays. Fifty tents have been erected around the simple building, one per person. Two bus loads of material and equipment have been delivered here, as has the luggage of the participants in the excavation, who come from all over the world: Berlin, Sofia, Georgia, Turkey, the USA and from other countries too, depending on the campaign. All of which has to be coordinated.

11.5 tonnes of Potsherds...

The research procedure is explained by Svend Hansen and Agathe Reingruber from the Eurasia Department of the German Archaeological Institute: “We’re digging down in 10 cm steps towards the start of occupation.” That sounds like painstaking, laborious work, and so it is. “It could take a few more campaigns until we get down there,” says Agathe Reingruber. And it takes a similar length of time to begin to get the measure of an archaeological site. “After ten years you can be confident that you have understood something,” says Hansen. It’s not “only” about pieces of broken pottery. “No, it’s about reconstructing an ancient society in terms of its cultural character and the adaptation of its natural environment.” Archaeologists can’t hope to strike it lucky straight away, like fictional heroes equipped with spades and a map of buried treasure – or GPS and SUV – who stumble upon an ancient world and instantly know, “It’s got to be here!” Every excavation is preceded by lengthy and involved surveys, and if the research history of a particular region is only patchy and can supply few indications of possible archaeological sites, then surveying can be a time-consuming and costly process.

In the recently discovered outer settlement lying to the north and west of the tell, heavy machinery first of all clears away a metre-thick layer of earth that contains no finds. Then comes the phase of descending in 10 cm steps, in which finer instruments are used. Every single piece, no matter how small, is put in a finds bag that is sealed and labelled. Perfect documentation is the be-all and end-all of archaeological work. “If I don’t know where the find comes from, I might as well throw it away,” says Hansen. The pieces

**PIETRELE**

The settlement hill known as Măgura Gorgana will have been an imposing sight in the 5th millennium BC. Sited on the lowest terrace of the Danube valley, the approximately nine-metre-high tell stood some 15 metres above the level of the meadows in that period. The tell was integrated in a network of comparable settlements on the Lower Danube, in north-east Bulgaria and Thrace. In the 5th millennium BC this region witnessed a dynamic expansion in copper metallurgy. For the first time, axes and hatchets as well as many ornamental objects were made of copper. At the same time the mining of copper ore began in the Balkan mountains and in eastern Serbia. Pietrele was part of a supra-regional network of exchange that extended – as artefacts of similar type attest – between the north Aegean and Wallachia, the Black Sea coast and Oltenia. The Black Sea is approx. 200 kilometres away and it is the same distance to Varna. There, in the 1970s, a cemetery was discovered with grave goods of varying degrees of richness, implying the formation of social inequalities.

SVEND HANSEN

**SHERDS BRING LUCK**

In Pietrele, an ancient society is being brought back to life, layer by layer

**ACCOMMODATION**

The archaeologists sleep in 50 tents that stand around the Pietrele school building during a campaign. They built the showers themselves.

**SORTING**

Finds must be carefully documented immediately after being recovered.
are not only photographed, but also drawn. Drawings are superior to photos in rendering certain structural features of the artefacts, while photographs reproduce surface and colour more accurately. The pieces are washed twice and cleaned of sinter, sherds, bones and shells are sorted, weighed, measured and counted. Once two women in the group counted out 5,200 shells. What at first sight seems to be documentation for its own sake is potentially highly informative about aspects of life in the ancient community, the organization of work, the eating habits and even the ancient landscape, which was very different from today’s in respect to climate and topography.

It’s not only pottery fragments that the archaeologists find. Occasionally jars are found intact, while others can be pieced together. In all, 11.5 tonnes of potsherds have been recovered in Pietrele – on average one tonne per year; some 400,000 sherds and 1,649 complete vessels.

“That’s not as much as it sounds,” the archaeologists explain. “You have to remember that everything we keep today in plastic containers, bottles, jars, tins, paper and cardboard boxes used to be kept in ceramic vessels.” Of course there were also baskets and containers made of wood and textiles, but they have perished after 6,000 years.

THE DAY
At half past six the bus leaves the village for the excavation site four and a half kilometres away. The participants work in two groups: one digging, the other documenting. Ceramic finds are processed immediately. With this amount of material it would be fatal to put the documentation work aside until later. “That was normal practice in archaeology in the past,” says Hansen. It might work perhaps if you kept a good diary. Today, though, it is standard to be up to date with the documentation.

Digging continues until 2.30 and then the participants have free time. A warm evening meal is served at seven. “Our cook…” the archaeologists say. What could sound so colonial is in fact how a small local catering service is styled. The cook has two assistants and lives near the school. She cooks for 50 people and brings the food out to the team members at the tables. On the menu are potatoes and vegetables, fried egg with French-fried potatoes, stuffed peppers, drum sticks with mashed potato, peas and sausages, baked zucchini with garlic sauce. Breakfast consists of white cheese and bread, tomatoes, bell peppers, chocolate spread, jam or organic muesli from the local shop. Meet is a rarity; occasionally at the weekend a sheep is grilled. A big research institute like the DAI is an employer at every place it operates. The young men who are hired for manual labour on the dig have little chance of finding decent work in difficult times. Some get into the spirit of the dig and talk up the day’s successes when they get home: “Guess what we found today, a superblade!”

MEALTIME A small catering business provides much-needed sustenance.

MAKESHIFT The school in Pietrele is used by the archaeologists as an expedition house during the summer vacation.

EXCAVATOR, SPADE, TROWEL
The archaeologists are digging down to the start of occupation in 10 cm steps. It will take a few more campaigns until they get “down there.” Heavy machinery is sometimes brought in for the first stage of the dig: a hydraulic excavator removes the plough horizon. Once a trial excavation, a geomagnetic survey or an investigation by ground-penetrating radar has been conducted in order to select the right place to dig and ensure that as little as possible is destroyed. The resultant rectangular pit is the excavation section. The sides of the section are cut smoothly using spades, the dirt is levelled and the earth is carefully removed across the entire section using trowels. Every section director keeps a documentation folder containing a meticulous record of progress. Measurements and photographs are taken; sections are subdivided into segments according to coordinates; the outlines of the section are drawn at the scale 1:100, with detailed maps at 1:20; height differences are entered on the map, marked features are numbered and drawn in. Finally the fragments are described: their shape, size, position and orientation, their composition and presumed function. This is known as the preliminary description. Then the earth is removed layer by layer, the coordinate system is recorded, and the feature is levelled, drawn and photographed. At some point it becomes clear what the find could be; the next layer is removed and then it is described again. This is called the final description.

For the work now there is a well-established routine. “At the beginning it was an adventure with little money and lots of obstacles,” remembers Agathe Reingruber. The pilot project was carried out in 2002, the first campaign in 2004, and apart from the scientific questions there were problems of a practical nature to be dealt with. How do you build a shower? What do you do when there’s a power outage due to rain? For a water supply the archaeologists had to bore 40 metres deep. “It was a nightmare,” Reingruber recalls. And where four supermarkets and a big drugstore now cater to the residents’ daily needs, there used to be one small village shop that mainly sold cheap spirits.

It rains at Pietrele about once per campaign. That lessens the midsummer heat but brings other hazards. “You then have four minutes to get from the bottom Danube terrace to the top one,” Svend Hansen says with a laugh. Otherwise it gets so muddy and slippery that people plus expensive equipment simply get stuck. The team members all make a dash for the school. Most of them have got wet and stand there steaming in a very confined space. In cases like these the excavation director orders pizza in the nearby town.

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The Roman-Germanic Commission (RGK) was founded in 1902 in order to research the Roman legacy and beyond that the entire prehistory and early history of Europe. Today, after 110 years of cooperation in a Europe that is growing ever closer together, this of course means something different to what it did in the age of empires. A common, united Europe is therefore the chief area of research for the RGK, which is based in Frankfurt am Main and operates with its own statutes though under the umbrella of the German Archaeological Institute. The scope of its research ranges from the earliest periods of European history through the Metal Ages up to and including the Middle Ages. A major focus is work on the large and widely distributed groups of Celts in central and western Europe, while the “Roman” in the Commission’s name derives from the archaeology of the Roman provinces with research projects on the limes and on cultural exchange between the conquerors from the south and the local populations.

Cooperation with national and international research institutions and heritage protection agencies are a matter of course – as, for instance, in the biggest international collaborative project, ArchaeolLandscapes Europe, which uses modern aerial technology to record the common cultural heritage so as to be able to preserve it; 57 research institutes from 27 countries are involved.

Another significant international project is “The Rise and Decline of the Early Bronze Age settlement Fidvar near Vráble, Slovakia” as part of which the economy, social structure, political organization and environment of a social group are being jointly investigated.
The plants they are dealing with are wild species native to that region or cultivated varieties. “If a plant occurs outside its natural area of distribution, we can assume what we have is a cultivated form,” says Neef – the wild vine was originally to be found predominantly in the northern Mediterranean region, around the Black Sea and probably around the Caspian Sea.

The oldest evidence of vine cultivation was discovered in 2003 by archaeologists of the Orient Department of the DAI. A vessel came to light that contained several thousand small black charred seeds. “These ‘seeds’ dated from the period between 3800 and 3600 BC,” Neef says. Their spectacular survival was the result of a destructive fire. “Normally most plant remains perish in the course of the millennia,” the archaeobotanist explains. “But if plant remains aren’t completely reduced to ashes in a fire for lack of oxygen, because they are covered by other materials, then we gain very good material for examination.”

When the archaeobotanists got to see the contents of the jar, they thought at first that the black objects were grape seeds. “But what sense would it make to store grapes that way?” asks Neef. During the microscopic analysis they finally found fruit stalks and tiny pieces of fruit skin. While grapes in a jar make no sense, raisins can be conveniently transported, just like olives, oil and wine, even though the latter would not have kept as long as other goods and so additives were probably necessary. “We don’t know what the wine tasted like,” says Neef. “But definitely not like what we’re used to today!”

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The archaeobotanist laboratory

Botanical samples from 28 excavations in 17 countries are being examined by the archaeobotanists at the DAI. Analysis of plant macro-remains like seeds, fruits and wood can throw light on the nutrition and development of cultivated plants as well as on agriculture, trade, exploitation of natural resources and environmental conditions in prehistory and protohistory. Pollen analyses furthermore provide detailed information on vegetation history and climate development. The transition from hunter-gatherer cultures to the sedentary way of life with agriculture and animal husbandry, and the little studied emergence of the oasis economy during the early Metal Ages, are two central fields of the laboratory’s research work. Altogether, the reconstruction of ancient flora – whether wild or cultivated types – can generate information on the interactions between humans and the environment. Substantial reference collections exist to help in the identification of plant remains. The collection of recent seeds and fruits currently contains approx. 5,150 different types of plant. For wood identification there is a collection of specimens of about 250 wood species. For pollen analysis, too, a collection of specimens of more than 1,400 plant species is available. In addition there is a collection from the 1930s comprising stone-fruit of old fruit tree taxa from the Spät Arboretum.
100 years ago, archaeologists discovered the first great city. At Warka, the historical Ur in Mesopotamia, the earliest evidence of urban life came to light. The centenary of the excavation project is now marked by a special exhibition: "URUK. 5,000 Years of the Megacity" organized by the Vorderasiatisches Museum (Museum of the Ancient Near East) of the Staatliche Museen zu Berlin jointly with the Orient Department, Photo Archive.

In 1954, the Antiquities Administration in Baghdad transferred the excavation liability to the German Archaeological Institute and the German Oriental Society. In close cooperation with the Orient Department, the German Archaeological Institute and the German Oriental Society, the Antiquities Administration in Baghdad, in 1957, established the Antiquities Administration in Baghdad. From 1958, the excavation at the site of the city of Warka was conducted by the Oriental Institute of the University of Chicago.

THE FIRST CITY

Uruk was the site of an impressive number of key innovations: innovations that continue to affect the way we live today. The rise of the first city at the end of the 4th millennium BC was accompanied by the emergence of complex modes of life and forms of administration. Large-scale supply of food and everyday articles for the inhabitants as well as management of water, imported goods and know-how became central functions of the city. Here, the first cuneiform writing evolved, a necessity of the elaborate administrative system. In the 4th millennium BC, Uruk moreover played an important political role, integrated in a far-reaching international network. In the following 3,000 and more years of its existence, the city was a major scientific and religious centre.

THE EXHIBITION "URUK. 5,000 Years of the Megacity" will be on show at the Pergamon Museum, Berlin, from 25 April to 8 September 2013 and at the Reiss-Engelhorn-Museen in Mannheim from 20 October 2013 to 21 April 2014. As a result of the then customary division of finds, many excavated objects were brought to Germany, where they were kept at the Vorderasiatisches Museum (in the Pergamon Museum) and also at Heidelberg University which holds the Uruk-Warka Collection of the German Archaeological Institute. Now, thanks to a unique collaboration between these four institutions, objects from separate collections will be reunited at the exhibition. Visitors will also see high-calibre exhibits on loan from museums such as the British Museum in London, the Ashmolean Museum of Oxford University and the Musée du Louvre, Paris, in addition to new 3D reconstructions of the metropolis and a number of specific monuments.

In Berlin, the first city to host it, the special exhibition will be presented in one part of the permanent exhibition of the Vorderasiatisches Museum in the south wing of the Pergamon Museum. There, the monumental architecture that accompanied the emergence of large-scale urban life at Uruk is illustrated by reconstructions of the more than 5,000 year old clay cone mosaic facades which have been displayed there since the museum first opened in 1930. The special exhibition "URUK. 5,000 Years of the Megacity" will present these earliest known examples of urban architecture along with newly created visualizations.

King Gilgamesh, the youthful demigod, rules despastically over his subjects, who appeal to the gods and are heard. To bring peace to the land and the population, the gods decide to find Gilgamesh a companion who is his equal. They create Enkidu, who grows up among animals in the wilderness. When Gilgamesh learns of his existence, he has the young man brought to him, and the two heroes immediately pit their strength against each other. It soon becomes clear that neither of them can gain the upper hand, and so they decide to become friends. The story of Gilgamesh does not end here. Where it begins is his home town, Uruk.
THE STONE of the Pregnant Woman (Hadschar al-Hibla) or Stone of the South (Hadschar al-Qubla) in Baalbek, Lebanon, is one of the biggest monoliths in the world. The stone, along with another one of similar size found nearby, belonged to a Roman building site in the temple complex of Baalbek and was intended for the podium of the Temple of Jupiter. The dressed stone block is approx. 20 metres long, from four to over five metres wide, and over four metres high. Its weight is estimated at around 1,000 tonnes. It never left the quarry. Photo: Klaus Rheidt

CONSTRUCTION SITES
Megacities, wonders of the world and other monuments