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Preface

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On 22 and 23 February 2013, the Forschungsschwerpunkt Historische Kulturwissenschaften at the Johannes-Gutenberg-Universität Mainz organised an international symposium on the Nile as a natural phenomenon, and on the impact of the river on Egyptian culture in the broad sense of the word.

That the Nile was of crucial importance to Egypt, a country surrounded by desert, is obvious to all, and has been realized already since Antiquity. Yet, the river as an environmental and cultural factor has been less intensively studied by archaeologists and Egyptologists than might be expected. One issue is that these scholars often work on the basis of an inadequate familiarity with the geomorphology of floodplains. For instance, texts and scenes concerning Nile deities or of religious customs related to the river are usually explained by referring to notions like 'ideal floodheights', which are never defined. Other scholars do take into account scientific evidence, but usually they base themselves upon a small amount of studies produced over a century ago, sometimes directly transferring the information provided by those accounts to the far more distant pharaonic past.

In this regard, the many publications by Karl Butzer (most notably his *Early Hydraulic Civilization in Egypt* [1976]) mark a watershed. Outdated though many of his conclusions may now be, its lasting importance lies in showing that an integration of Egyptological evidence with data produced by the natural sciences *works*, and in for the first time pointing out the kinds of questions that can be approached in this way. The areas intensively dealt with by Butzer were (settlement) archaeology, economic history, technology, and demography. However, one might also add religion, as the cycle of the Nile had such an impact on all aspects of life that it also co-determined for instance the religious calendar and the phasing of rituals. At roughly the same time as Butzer published his seminal work, Manfred Bietak's *Tell el-Dabʿa* II (1976) showed

in an impressive fashion how the integration of geographic and archaeological data can contribute to the reconstruction of now-vanished landscapes.

More recently, Stephan Seidlmayer's book on historical and modern flood levels (2001) has created a new basis for understanding some of the effects of the Nile. It shows that we are facing a natural phenomenon, the study of which is fundamentally the domain of the natural sciences, but also that available evidence includes ancient and culturally biased material of a kind that lies far beyond the competence of most natural scientists. The problem in addressing the dispersed and incongruous sources of information is that an intensive interaction between numerous disciplines with little tradition of collaboration is needed.

Nowadays, significant progress is being achieved particularly in integrating earth sciences and Egyptian archaeology. One aim of the symposium was to enable natural scientists to compare the methods they deploy and the kinds of results they attain at the various sites. Another aim was to compare the results of regional interpretations from different parts of the country to address broader issues (like the size of the floodplain, the validity of hypotheses about the drift of the Nile bed, or the potential for economic and demographic analysis).

A further aim has been to assess ancient indigenous evidence testifying to how the Egyptians reacted to the environmental conditions imposed by the nilotic environment. For this, archaeological indications could be the spatial distribution of sites in relation to features of the floodplain landscape (e.g. settlement spread); the system of irrigation, or the date when certain changes in land form, land cover, or land use occurred. The importance of spatial data for modeling the modern and ancient landscape with the help of remote sensing and near surface geophysics has in the most recent years also come to the fore. But ancient Egyptian written and iconographic reflections on the landscape can be equally important. Specialists in these areas have been less prone to look at scientific evidence, and their work is often less accessible to the natural scientists.

Another issue is that Egyptology, while covering a time range that historians would consider very wide, is concerned with what to earth scientists is a very short period of time. All inhabitants have had to both control and exploit that ecological framework provided by the Nile. This was so in the pharaonic period, which is the domain of Egyptologists. However, the matter was no different in the Byzantine, medieval and post-medieval periods, and therefore historians interested in these more recent periods investigate material that is no less relevant.

The aim of the conference was to bring together a group of specialists from these diverse disciplines. The programme was as follows:

22 February 2013

Morning session: Chair: *Judith Bunbury*

Prof. Dr. Ulrich Förstermann, Vizepräsident für Forschung (Johannes-Gutenberg-Universität Mainz): *Welcoming Speech*

Prof. Dr. Stefan Müller-Stach, GFK-Leitungsgremium ((Johannes-Gutenberg-Universität Mainz): *Welcoming Speech*

Harco Willems (Johannes-Gutenberg-Universität Mainz/KU Leuven): *The Analysis of Historical Maps as an Avenue to the Interpretation of Pre-Industrial Irrigation Practices in Egypt*

Luc Gabolde (CNRS Montpellier): *The Origins of Karnak – Geoarchaeological, Astronomical, Textual and Theological Sources*

Angus Graham (University College London): *The Origins of Karnak – Geoarchaeological and Geophysical Survey Results*

Gert Verstraeten (KU Leuven): *The Dynamic Nature of the Transition from the Nile Floodplain to the Desert in Central Egypt since the Mid-Holocene*

Harco Willems (Johannes-Gutenberg-Universität Mainz/KU Leuven): *The Hare Nome – from Physical Geography to Social Archaeology*

Afternoon Session – Chair: *Manfred Bietak*

Cornelia Römer (Deutsches Archäologisches Institute Abt. AI Kairo): *Irrigation Canals in the Fayum*

Dirk Blaschta (Universität Leipzig): *Geoarchaeological Investigations of the Area Surrounding the Dahshur Necropolis*

Judith Bunbury (University of Cambridge): *Migrating Memphis – The Development of a City in a River Floodplain*

Ana Tavares (Ancient Egypt Research Associates): *The White Walls – The Landscape of the Capital Zone*

Willem Toonen (RijksuniversiteitUtrecht): *Implications of the Holocene Palaeo-Environment on Cultural Dynamics in the Western Nile Delta*

Joshua Trampier (Oak Ridge Associated Universities): *Above, atop, and below – Integrated Methods for Reconstructing the Cultural and Natural Landscapes of the Western Nile Delta*

Manfred Bietak (Österreichische Akademie der Wissenschaften): *Harbours and Coastal Military Bases in Egypt in the 2nd Millenium: Avaris – Peru-Nefer-Piramesse* (keynote speech)

23 February 2013:

Morning Session: Chair: *Cornelia Römer*

Penelope Wilson (Durham University): *Isolation and Resistance in the Northern Nile Delta Landscape*

Rainer Nutz (Universität Basel): *Nile Gauge Readings and the Agrarian Potential in the Middle Kingdom*

Jean-Christophe Antoine (Université Jean Monnet Saint-Etienne): *Modeling the Nile Agricultural Floodplain from Papyrus Wilbour and Xth Century B.C. Land Registers*

Pierre Koemoth (Université de Liège): *Cultivable Land and Crocodiles – Ethology, Religion, and Economy in the Nile Floodplain in Roman Egypt*

Afternoon Session – Chair: *Harco Willems*

Jan Tattko (Eberhard-Karls-UniversitätTübingen): *Personifications of the Nile Flood according to Graeco-Roman Temple Inscriptions*

Sandra Sandri (Johannes-Gutenberg-Universität Mainz): *Nilometer – oder: Kann man Wohlstand messen?*

Stuart Borsch (Assumption College Worcester/MA): The Water Regime of Medieval Alexandria

The present, peer-reviewed volume offers the proceedings of this symposium. The result shows a wide range of topics, but the papers have in common that they show how the integration of evidence from different disciplines can change our perspective on ancient Egypt.

One series of papers published here are site- or regionally-specific studies integrating earth-scientific approaches with Egyptological and archaeological evidence. The papers address regions across Egypt, and demonstrate how the different types of environment in those regions impacted upon living conditions and, ultimately, social and historical processes there.

Penelope Wilson's article reports on the results of a recent archaeological survey of the surroundings of Lake Burullus at the northern fringe of the western Nile Delta. The work of her research group has led to the discovery of numerous hitherto unknown or potential archaeological sites there. She places their emergence in the context of long-term developments from the Graeco-Roman period until the late first millennium AD. Due to a decreasing sea level in the early part of this period, the area's agricultural potential increased, and

many of the sites discovered, some of which are very prominent, go back to this period. However, the author notes evidence for the increasing development of swamps as of the fifth century A.D. Based on a discussion of five exemplary settlement sites, she shows how economic sustainability decreased in the early Islamic period and how archaeological remains help to understand the human response to these changing conditions.

Joshua Trampier's paper concerns work in an area immediately adjoining the one Wilson has been working in on the southwestern Delta fringe. The sites there date to the same period. Trampier discusses his work at one site – Kawm am-Qamḥa – in detail, so as to offer an overview of the various methods he has deployed (remote sensing, coring, field surveys, study of historical maps).

Manfred Bietak's article moves the perspective to the eastern Nile Delta around Tall al-Dabʿa. His discussion concerns the available evidence for the location of the New Kingdom harbor of Perunefer. In the past, this place was believed to have been located in the Memphite region, a point of view that was recently defended once again. Bietak's paper presents archaeological, geomorphological, and textual evidence demonstrating not only that the case for Memphis rests on a weak basis, but also that it is very likely that Perunefer referred to the harbor area of Avaris / Piramesse.

The Memphite region is among the earliest where archaeologists have shown an interest in contextualizing the archaeological record with floodplain research, but most of the relevant studies were published some twenty years ago. The article by Judith Bunbury, Ana Tavares, Benjamin Pennington, and Pedro Gonçalves offers an update on the current state of research. Their research addresses long term developments like climate change, the impact of sea level changes and wadi and Aeolian sand depositions on the nature of the floodplain. Their study adduces fresh indications that are interpreted as indicative of an eastward shift of the Nile bed. Moreover they argue that the head of the Nile Delta showed significant displacements over time. All these indications lead to a time series in which the archaeological record for settlement and cemetery use in the region is correlated with the evolving landscape.

Cornelia Römer studies the systems of water management deployed in the Fayyūm in the Middle Kingdom and the Graeco-Roman periods. Following Ball, she argues that the situation reportedly seen by Herodot, to the effect that water from inside the Fayyūm may have receded back into the Nile Valley after the flood, may have obtained also in the Middle Kingdom. She argues that the dams at the entrance of the Fayyūm may date back to this early period, and that they have played a role in controlling the movement of floodwater into and out of the Fayyūm, and from the Nile Valley to the north. The second part of her

study argues that, as of the Ptolemaic period, the water level in the Fayyūm had shrunk considerably, and that this process went hand in hand with a more rational water distribution across the depression. Her account of this later period is particularly interesting by showing, through a combination of archaeological field surveys, geomagnetic research, and papyrological indications, how the flood regime worked in the Graeco-Roman period.

Two articles study the form of the landscape in Middle Egypt, roughly between where the borders of the Hare nome were in Antiquity (i.e. between Dairūṭ al-Sharīf in the south and the village of Itlīdim in the north). Verstraeten, Mohamed, Notebaert and Willems study the dynamics of the interface between floodplain and desert on both the eastern and western desert edges in this region. Using a similar array of methods as Trampier, they conclude that, on the east between al-Barshā and al-Dayr Abū Ḥinnis, the Nile has migrated from east to west since pharaonic days, and not in the opposite direction, as is often assumed. On the western desert edge, they were able to model the migration of dunes into the floodplain and their impact on the Baḥr Yūsif system in the course of the Holocene. The paper also demonstrates that interdune areas in that region were already used for agricultural purposes in the Old Kingdom. Willems, Creylman, De Laet and Verstraeten also investigate the western floodplain in the region of the Hare nome, this time primarily on the basis of the information of historical maps. Their paper demonstrates that, in the eightteenth century, the floodplain was still a mostly natural landscape, in which human intervention was restricted to the construction of dykes. The flood regime is reconstructed, the most important result being that much of the residual floodwater did not return to the Nile, but remained captured between the levees of Nile and of Baḥr Yūsif. Since the same situation prevailed further north, it is clear that the presence of a large, humid area in the centre of the western floodplain, as recorded in eighteenth century maps, must be taken seriously. The article studies the effects of this hydrological phenomenon on more northerly areas, and most notably on the Fayyūm, addressing several of the issues also dealt with by Cornelia Römer. Study of historical toponymy and archaeological evidence suggests that essential elements of this eightteenth century model were in force already in the pharaonic period.

Felix Relats Montserrat discusses the tribune and the quay that presumably accompanied it to the west of the temple of al-Madamūd. The question interesting him is whether it connected to a NE-SW canal allegedly linking the temple to Karnak North, or whether the Nile may in the First Intermediate Period and Middle Kingdom, when the temple emerged, have lain closer to the building. He

concludes that only future geomorphological research can solve this problem, but argues that the latter possibility probably has the greater likelihood.

At the conference, Angus Graham and Luc Gabolde presented two fascinating, although partly contradictory papers on soil formation in the Karnak area. Since these papers will be published elsewhere, Gabolde, Graham and Mansour Boraik here present a new study, concerning the evolution of the quays at Karnak between the early New Kingdom and the Graeco-Roman period. They first discuss written evidence, showing that there were in antiquity many islands opposite Thebes. They also mention records referring to canals west of the temple, and perhaps also to its east. The rest of their study offers a fascinating overview of excavated embankments of different periods and of the results of geomorphological research in the same area. This leads to a series of partly hypothetical maps, arranged in a time series, which display how the development of the Karnak temple followed (and partly influenced) the changing landscape due to the westward migration of the Nile bed.

The remaining two papers discuss, not specific regions and landscapes, but cultural themes reflecting the ways how Egyptian culture reacted to the constraints and possibilities offered by the Nilotic landscape.

Late New Kingdom land registers like P. Wilbour and P. Reinhardt are among the most important administrative documents that have survived from ancient Egypt, and they have been intensively studied in the past. Jean-Christophe Antoine's contribution to this volume offers a new and highly interesting approach to study these documents as a source of information on land form, land use, and social structure. These documents offer information on thousands of plots of land, their location, the type of land concerned, the identity and profession of their owners, and so on. Deploying multiple correspondence analysis, multivariate logistic regression, and univariate analysis, Antoine demonstrates that hitherto unsuspected links existed between certain social categories and specific geographical zones, which he is able to link to hydrologically distinct areas in the landscape. Moreover, his statistics raise the interesting idea that the term *ḳꜣi.t,* designating a type of 'high' land (perhaps on a levee), and the same term referring to a fiscal plot category, are actually conceptually entirely different things.

Finally, Sandra Sandri discusses the iconographic theme of the nilometer as it appears in the late Roman period across the Mediterranean. The earliest examples appear on second century Roman coins, and on reliefs from the Nilotic staircase on Elephantine island. Most of the other examples are much more recent, and many derive not from Egypt, but from other parts of the

Mediterranean. The article addresses the figures depicted on the nilometers, which are quite high. Although the few cases where the scenes indicate which nilometer is intended all agree that it concerns the one at Alexandria, the flood heights there must have been much lower than is indicated in the scenes, and the remains of the nilometer excavated at Alexandria by Alan Rowe look rather different than what the depictions show. Therefore, what is depicted is in many cases obviously an imaginary nilometer, which just has the aim of rendering an Egyptian scenery.

Last, but certainly not least, the editors have to express their gratitude to a number of persons and institutions at the Johannes-Gutenberg-Universiät Mainz. It is due to the generosity of the Johannes-Gutenberg-Forschungskolleg of this university that Harco Willems was able to spend a research period at the Forschungsschwerpunkt Historische Kulturwissenschaften (HKW) at the Johannes-Gutenberg-Universität Mainz between 1 April 2012 and 31 March 2013. In this context, Jan Dahms was moreover appointed as a scientific collaborator. This exceptional privilege not only gave us time to conduct research and to organize the symposium of which the proceedings are presented in this volume, we also have fond recollections of the friendly way we were received at the HKW and at the Ägyptologisches Institut at Mainz. At the HKW, we wish to express our thanks to Prof. Dr. Jörg Rogge and to Kristine Müller-Bongard for their support. But we owe a special debt of gratitude to Prof. Dr. Ursula Verhoeven and Prof. Dr. Tanja Pommerening. It was they who took the initiative to propose to the HKW to invite the first editor of this book as a Johannes-Gutenberg research fellow. Thank you very much for your friendship and support.